China Nuclear and Radiation Safety Management System

General Principles

Ministry of Ecology and Environment
(National Nuclear Safety Administration)

December 2018

Policy Statement on Nuclear and Radiation Safety Management System

In 1984, the State Council made the decision to establish the National Nuclear Safety Administration (NNSA) and entrusted it to supervise the safety of China's civil nuclear facilities. Since then, China's nuclear and radiation safety regulation started from scratch and developed into an important force in the world nuclear and radiation safety area through all kinds of hardships.

For over thirty years, China's nuclear and radiation safety regulation has gone through an extraordinary journey. Through continuous exploration, learning, practice and innovation, China has established a nuclear and radiation safety regulatory system that is in line with the international standards as well as the national condition of China, and has cultivated a team of nuclear and radiation safety regulation with ambitions and competences.

As an independent nuclear safety regulatory body, NNSA has always advocated the nuclear safety culture, implemented the policy of safety first and quality first, followed the regulatory principle of independent, open, legal, rational and effective, adhered to the regulatory way of be extremely strict, prudent, delicate and pragmatic, and imparted the nuclear safety spirit of the overriding priority of nuclear safety; heavy responsibility on the nuclear safety responsibility; strict, prudent, delicate and pragmatic regulation; making progress with team work, for the purpose of effectively implementing the responsibility for nuclear safety regulation.

Nuclear safety and radioactive contamination prevention have a bearing on the public health, environmental safety and social stability. The Party Central Committee and the State Council attach great importance to nuclear safety and the prevention of radioactive pollution. Nuclear safety has been included into the national security system and highlighted as a national security strategy. The work coordination system for nuclear safety has been established so as to coordinate the departments concerned to promote relevant works. China is a country that makes great use of nuclear energy and nuclear technology. For over thirty years, the safety performance on the use of nuclear energy and nuclear technology has always kept good level. The nuclear power safety has reached the international advanced level. Good records have been kept for research reactors and nuclear fuel cycle facilities.

The key to obtaining the above achievements is to carry forward the excellent traditions, summarize the advanced experience, develop an effective mechanism and

adhere to the following ten items:

Adhere to cultural leading. A proper perception and understanding is the prerequisite for right actions. The leading role of nuclear safety culture is always attached. Full play is given to the inspirational charisma, image leverage and moral obligation of safety culture to deepen the understanding of safety among employees and the public, and implement them as conscious actions. With persistent efforts, the nuclear safety culture has been introduced to China from abroad and taken root in our systems, industries and even the whole society.

Adhere to law-based administration. It is required to value the binding force of laws and regulations, adhere to manage the safety important activities according to law, and ensure the implementation of regulatory activities according to law. The law-based administration is insisted to ensure that all regulatory behaviors are authorized according to law. The regulation is conducted in strict accordance with laws.

Adhere to reliance on mechanisms. A set of mechanisms as to review, inspection, law enforcement, monitoring and emergency has been established based on the actual conditions of regulation. Full play has been given to such mechanism to coordinate the strengths of various parties and various elements, which ensures the regulatory efficiency and improves the regulatory effectiveness. Effective mechanisms such as full-process regulation, all-weather monitoring, and review with Party A & Party B role have provided effective guarantee for the efficient implementation of regulatory inspection and review.

Adhere to in line with international standards. With reference to international standards, China has established a set of nuclear and radiation safety regulation system that is in line with international standards and national conditions. By drawing on international practices, a comprehensive and effective nuclear and radiation safety regulation model has been established to ensure that the nuclear safety level of China is always consistent with the international advanced level. It is required to give play to late-development advantage, learn about borrowlism and fully learn lessons from the international advanced experience.

Adhere to problem-orientation. It is necessary to perform risk identification and risk source management; develop grading approach. Great importance is attached to experience feedback; comprehensive lessons are learned from accidents and events; safety improvements are proposed and implemented. Great importance is also attached to the investigation and processing of events and accidents. The events and accidents are deemed as an opportunity to identifying and solving problems. It is

important to get to the root of the problem so as to eliminate hidden dangers.

Adhere to strict management. The awareness of being strict is firmly fostered. It is necessary to adhere to the strict management. Strictness is the greatest support to the regulated party, and safety is the greatest benefit. It is required to insist on being strict with review, licensing, inspection and law enforcement. Strict precautions are taken from the outset; strict management is performed for the process; and severe punishment is implemented on consequences.

Adhere to continuous innovation. Innovation is the motivation. The theory innovation will promote the innovation of systems, mechanisms, methods and technologies to break the regulatory bottleneck. The new idea of reform and innovation is followed to promote the addressing of long-existing difficulties, hot issues and focus issues in such aspects as radioactive pollution, public communication and capacity building.

Adhere to consolidating foundation. Based on the people-oriented concept , it is required to foster a team of regulatory personnel with clear responsibilities and reasonable age structure; be committed to cultivating the capabilities in review and licensing, inspection, law enforcement, radiation monitoring, emergency response, experience feedback, technical research and development, public communication and international cooperation; attach great importance to the development of independent verification and validation calculation software; lay emphasis on the establishment of safety test verification platform and radiation environmental monitoring network.

Adhere to cooperation. It is required to advocate the harmony idea of work as a family towards a same goal and to create a firm, harmonious and lively working atmosphere. To achieve this, the first principle is to be strict. It is required to be highly disciplined, be prudent with behaviors and be strict with regulation. The second is to be harmonious. It is required to live in harmony, treat people kindly and develop harmoniously. The third is to be progressive. It is required to make progress in work, ability and team.

Adhere to starting from myself. The regulatory body is required to set an example; be strict with itself, that is to be able to fulfill the requirements imposed on the regulated party; pursue excellence and set a good example so as to lead the entire industry in continuous improvement. It is necessary to be persistent with the goal and work all along the way till it is achieved.

The start of the Thirteenth Five-Year Plan represents a new journey for nuclear and radiation safety. In February 2017, *The 13th Five-Year Plan and Prospective Plan of 2025 on Nuclear Safety and Radioactive Contamination Prevention and Control*

was approved and released by the State Council. Six goals, ten key tasks, six key projects and eight guarantee measures were defined in the Plan, including the six goals of improving the safety level of nuclear facilities, safety level of nuclear technology application devices, radioactive contamination prevention level, nuclear security level, nuclear and radiation emergency level, and nuclear and radiation safety regulatory level. It has defined the ten key tasks of maintaining the high safety level of nuclear power plants, reducing the risks of research reactors and nuclear fuel cycle facilities, accelerating the decommissioning of old nuclear facilities, treatment and disposal about radioactive waste, etc., and also six key projects of nuclear safety improvement, nuclear facility decommissioning, radioactive waste treatment and disposal, etc.

The *Nuclear Safety Law of the People's Republic of China* was approved on September 1, 2017 and came into force as of January 1, 2018. As the top-level law in the area of nuclear safety, it is an important part of the national security legal system, and also the outcome based on international experiences learned and the comprehensive summary of good practices in nuclear safety regulation over thirty years. It is of great significance to the safe, healthy and sustainable development of nuclear industy, to the maintenance of national security, and to the promotion of the Belt and Road Initiative development and "Going Out with the Nuclear Industry" strategy.

In March 2018, the Party and State proposal of institutional reform was approved in the Third Plenary Session of the 19th Central Committee of the Communist Party of China. The National People's Congress approved the establishment of Ministry of Ecology and Environment (MEE), which integrate all functions of the former Ministry of Environmental Protection and the functions related with pollution prevention and ecology protection of other ministries and commissions. MEE is known as NNSA to foreign countries. The evolution from the Ministry of Environmental Protection (MEP) to the MEE is a significant action of the Party Central Committee representing the deepening of reform, and also a profound change and great progress made in the construction of ecological civilization.

On the National Conference of Ecological and Environmental Protection convened in 2018, the General Secretary Xi Jinping highlighted that the development of ecological civilization is fundamental to the sustainable development of the Chinese nation. The nuclear and radiation safety is an important area of ecological civilization development, as well as a significant part of the national security. It was proposed at both the Third Plenary Session of the 18th Central Committee of the

Communist Party of China and the 19th National Congress of the Communist Party of China that the modernization of our governance system and governance capabilities shall be facilitated. The goal of "modernization of nuclear and radiation safety regulatory system and capabilities" has also been established for the nuclear and radiation safety regulation as it is a part of the governance system. To put it in detail, it is required to fully implement the Xi Jinping Thought on Socialism with Chinese Characteristics for a New Era; sincerely implement the decisions and arrangements made by the Party Central Committee and State Council; pursue coordinated progress in the "five-sphere integrated plan" and pursue balanced progress in the "four-pronged comprehensive strategy"; pursue innovative, coordinated, green, open and shared development; adhere to the rational, coordinated and balanced nuclear safety concept; insist on the fundamental principle of safety first, quality first; implement the responsibility of safety principals, continuously improve the safety level and ensure the safe and efficient development of the in nuclear energy and nuclear technology application by taking the risk prevention and control as the key, the law-based administration as the fundamental, the nuclear safety culture as the guide, the reform and innovation as the motivation and the capacity building as the support.

In order to realize the modernization of regulatory system and capacity, it is necessary to realize the modernization of the management ideas, methods and processes of the regulatory body in advance. The key is to ensuring the regulation with systematicness, scientificness, legalization, informanization and delicacy. Therefore, the MEE (NNSA) has established and maintained a centralized nuclear and radiation safety management system with clear responsibilities, integration of resources, optimization of processes, coordination from upper levels to lower levels and efficient operation based on the latest safety standards of the International Atomic Energy Agency (IAEA) and the good practices of the international peers as well as its own regulatory practices and development demands.

A nuclear and radiation safety regulatory system with sound legal system, complete organizational structure, strong technical capabilities and rich spiritual culture has been established by reinforcing the four foundations and eight supports. Regarding nuclear safety, it is well equipped with the capabilities in nuclear safety review and licensing, inspection and law enforcement, radiation monitoring, emergency response, experience feedback, technical research and development, public communication and international cooperation.

In recent years, the public have been increasingly concerned about nuclear safety. The nuclear public opinion has been emerging. The Party Central Committee and the

State Council has attached more importance to nuclear safety. The written instructions and comments have been obviously increasing, the number and depth of which are unprecedented. In addition, as the rapid development of nuclear power and nuclear technology in China, the radioactive wastes have been accumulating. The traditional nuclear and radiation risks have increased. In addition, the non-traditional risks such as nuclear terrorist attack, not-in-my-backyard issues of nuclear projects and North Korea nuclear environment safety rise one after another. The requirements for nuclear and radiation safety regulation are stricter; the relevant tasks are heavier and the need of transformation is more urgent.

Facing the new situation, the nuclear and radiation safety regulation deal with three transformations in order to achieve the leap-forward development. To put it in detail, as to the work content, it is transferred from the review and inspection of construction projects to the guarantee of the stable continuous and safe operation of nuclear facilities; as to the work mode, it is transferred from the regulation based on experience to that of standardization and normalization; as to the work methods, it is transferred from highlighting top-level design to highlighting comprehensive implementation. Among them, the transformation of the work mode is the most basic, critical, and urgent, while the development of management system is the top priority. The development of management system is an urgent need decided by the current situation. It is of great significance to the improvement of its own capacity, development of the long-term career, and the enhancement of safety level.

The development and effective operation of the nuclear and radiation safety management system is a long-term task. The leadership responsibilities are determined in the first place. The leadership attaches great importance to the job and takes the lead in learning, researching and implementation so as to direct relevant personnel to optimize the internal management, improve the regulatory efficiency and establish the long-term mechanism. It is required to strengthen the process control, reinforce the execution of institutions, include the implementation of the management system into the annual work responsibility system, periodically supervise, schedule and examine the work progress, identify issues for in-time improvement, ensure the thorough implementation of management system requirements, and ensure the implement of all tasks with high standard, quality and efficiency.

The maintenance and effective operation of the nuclear and radiation safety management system also requires the active participation and contribution of each nuclear safety regulatory practitioner. Through the training of all employees on management system, they fully recognize the importance and necessity of the

management system, deeply understand the scientific nature, professionalism and seriousness of the procedure and system, improve their recognition and understanding of the working duties, business process and standard requirements of the nuclear and radiation safety management, strengthen the awareness of responsibility and discipline, so as to become a responsible employee that understands and implements the corresponding responsibilities.

I hereby am committed to earnestly implement the duties endowed by the management system, authorize the Department of Nuclear Facility Safety Regulation to perform general planning, management and coordination for the management system, regularly organize and conduct the independent assessment and regulation, develop and take corresponding actions for identified issues in time, and modify and revise the documents and procedures of management system when necessary. It is required to promote the implementation, upgrade and maintenance of the management system and to improve the scientificness, systematicness and normativeness. It is required to reinforce the organizational guarantees, establish special teams, improve the overall coordination, so as to provide comprehensive, long-term and strong technical support for the operation and maintenance of the management system. The work style is improved and teams are established based on the principle of five developments (i.e. economy development, politic development, culture development, social development and ecological development). System is developed to set standards, define specifications and improve the work quality and efficiency. It is required to continuously identify the internal issues and external changes, construct a learning organization, continue to self-optimize and keep the advanced nature of the management system.

All relevant organizations and personnel participating in the nuclear and radiation safety regulation, besides of political and ideological construction, thoroughly implement the national nuclear safety concept, closely follow the national nuclear safety strategy, aim at the development target of two modernization to fully integrate the implementation of management system requirements and implementation of the guiding principles of the 19th National Congress of the Communist Party of China and the National Conference of Ecological and Environmental Protection with the education campaign themed "staying true to our founding mission."; inherit and impart the nuclear safety spirit, earnestly implement the requirements of the management system, regulate the management, intensify the internal and external communication and coordination, improve the regulatory quality, reduce the regulatory risk, impart knowledge and experience and work together to

build an ecological and environment protection team with strong political awareness, excellent skills, tough work styles, courage to take responsibilities, ambition for development and competence in making achievements, so as to implement the missions and duties endowed by the Party and the people.

Each regulatory staff is responsible and obliged to inherit the good traditions of systematic and normative management of regulatory works; report the deviations existing in the management system, continuously improve the management system; ensure the nuclear and radiation safety regulation is effective, fair, legal, credible and acceptable to the public; develop the MEE (NNSA) into a domestic authority and an international first-class nuclear and radiation safety regulatory body; and keep the nuclear and radiation safety regulation in China at the international advanced level.

Vice Minister of Ecology and Environment
Administrator of NNSA

Liu Hua

December 2018

Forward

Based on over thirty years of practices in nuclear and radiation safety regulation, the MEE (NNSA) has gradually developed a set of relatively complete regulatory concepts, ideas, methods and experience, which constitute the nuclear and radiation safety management system of China. The management system have been documented on the summarization of the China's experience in nuclear and radiation safety regulatory practices and by reference to the IAEA safety standards. The documents systematically describe the nuclear and radiation safety management system, innovate the management concepts and methods, optimize the management process, promote the participation of all relevant personnel and continuous improvement, and provide all-round support for the modernization of regulatory system and capacity.

The nuclear and radiation management system comprehensively describes the policies, goals and plans, organization structures and their responsibilities, the development of nuclear safety culture, resources and management required by the implementation of regulatory duties, main activities and requirements of critical processes in the management system, and measures for continuous improvement of the management system. It covers all areas and relevant activities, which is contribute to provide clear working standard and basis for all staffs of the regulatory system, establishe systematic perspective and global helping view for the employees , improve the strategic thinking, problem-oriented awareness and working efficiency, and further improve the quality of the regulatory activities, enhancing the authority and effectiveness of nuclear and radiation safety regulation, and continuously refine the nuclear and radiation safety regulatory system of China.

The nuclear and radiation safety management system covers the nuclear and radiation safety regulatory functions undertaken by the MEE (NNSA) and all relevant elements of management system; applies to all relevant departments/organizations of the nuclear and radiation safety regulatory system and their employees, including the headquarters, regional offices and technical support organizations. It is required to take the elements of safety, health, environment, security, quality, staff and organization, society, economy and health into comprehensive consideration to ensure that the principle of safety first, quality first is always implemented and the nuclear safety is given overriding priority.

As some aspects of the nuclear and radiation safety management system have been existing and operating for years, the planning and preparation of the documents of management system should not only be consistency with the existing rules and

operation mechanism of the MEE (NNSA), but also provide top-level design for the management system and improve the system. The documents should have a clear logic and defined requirements for the convenience of understanding and implementation, while highlighting the key points for the purpose of extracting and refining details and processes. The China's nuclear and radiation safety management system with Chinese characteristics and in line with the international has been established based on the overall planning and collaboration working inside the regulatory system.

During the documents development for the nuclear and radiation safety management system, the process method advocated by the IAEA safety standard have been widely applied to ensure any activity can be considered as a process involving planning, implementation, assessment and continuous improvement. The management system consists of a set of interrelated process networks, and each process has an inherent logical relation with another. The management system should be continuously improved and perfected by identifying, controlling and assessing the results of the process and by making use of the obtained information and experience feedback to improve the process.

The development preparation of nuclear and radiation safety management system is mainly based on the requirements of the following documents:

- *The Nuclear Safety Law of the People's Republic of China and* relevant laws and regulations for nuclear and radiation safety;
- The current regulatory organization systems and document systems of the MEE (NNSA);
- IAEA GSR Part 2 *Leadership and Management for Safety* and the guidelines;
- IAEA GSR Part 1 *Governmental, Legal and Regulatory Framework for Safety* and the guidelines;
- *The 13th Five-Year Plan and Prospective Plan of 2025 on Nuclear Safety and Radioactive Contamination Prevention and Control*, etc.

The documents of China Nuclear and Radiation Safety Management System are divided into four levels. Level I is the General Principles that describes the general structure, content and requirements of the management system; Level II is the work guideline and technical management program of various management elements and business areas, which is further divided into three parts of work guideline for general management, work guideline for business management and general technical management program; Level III includes the working instructions/working procedures, supporting procedures of general technical management program, special

technical management program and its supporting procedures, applicable rules and regulations quoted or referred by documents of Level II; Level IV represents the internal procedures developed by the professional departments, regional offices and directly subordinated organizations depending on their own situations. The document framework of China Nuclear and Radiation Safety Management System is indicated in the attached drawing.

Nuclear and Radiation Safety Management System can be used for the following purposes:

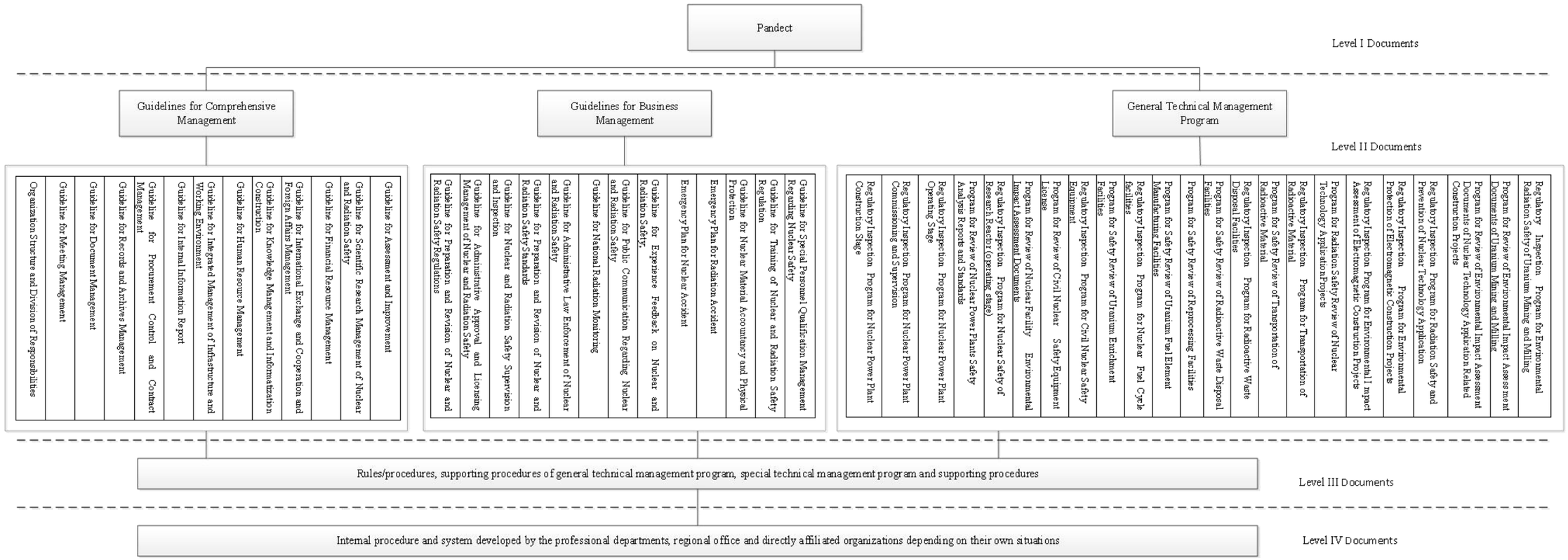
Organization culture manual: giving a whole description of China's nuclear and radiation management system; achieving mental cohesion and reaching consensus within the entire regulatory system. For example: what kind of organization is the MEE (NNSA); what is it working on or going to work on; what are the mission, vision, core values and goals of the MEE (NNSA), etc.

Employee manual and training materials for new employees: comprehensively clarifying the nuclear and radiation safety regulation and the internal comprehensive management of regulatory system; providing a road map and work instructions for implementation of management and technical activities: what should the MEE (NNSA) do; who undertake the job and how to do it. It is intended to make the planning, management, implementation, assessment and improvement of activities be more systematic, scientific, standardized and effective.

Publicity materials: As the publicity and communication tool, fully demonstrating the management commitments and efforts for ensuring the nuclear and radiation safety made by the MEE (NNSA) to the international peers and the public concerning China’s nuclear and radiation safety regulation; fostering the image of China’s nuclear and radiation safety regulator so as to raise the confidence and trust of the international community and the public in China's nuclear and radiation safety regulation.

The China’s nuclear and radiation safety management system is developed under the leadership of the Department of Nuclear Facility Safety Regulation of the MEE (NNSA) and prepared under the organization of various professional departments, with the assistance and support provided by regional offices and technical support organizations.

Frame Diagram of China's Nuclear and Radiation Safety Management System



Policy Statement on General Management System of Nuclear and Radiation Safety Regulation
2016
(2016 Edition)

In 1984, the State Council made the decision to establish the NNSA and entrusted it to supervise the safety of China's civil nuclear facilities. Since then, China's nuclear and radiation safety regulation started from scratch and developed into an important force in the world nuclear and radiation safety area through all kinds of hardships.

For over thirty years, China's nuclear and radiation safety regulation has gone through an extraordinary journey. Through continuous exploration, learning, practice and innovation, China has established a nuclear and radiation safety regulatory system that is in line with the international standards as well as the national condition of China, and has cultivated a team of nuclear and radiation safety regulation with ambitions and competences.

As an independent nuclear safety regulatory body, NNSA has always advocated the nuclear safety culture, implemented the policy of safety first and quality first, followed the regulatory principle of independent, open, legal, rational and effective, adhered to the regulatory way of be extremely strict, prudent, delicate and pragmatic, and imparted the nuclear safety spirit of the overriding priority of nuclear safety; heavy responsibility on the nuclear safety responsibility; strict, prudent, delicate and pragmatic regulation; making progress with team work, for the purpose of effectively implementing the responsibility for nuclear safety regulation.

With our joint efforts, China keeps a good safety performance in operating nuclear power units all the time, with no operating events of International Nuclear and Radiological Event Scale (INES) Level 2 and above up to now. The monitoring results over the years indicate that radiation level in surrounding environment of China's nuclear power plants are within normal fluctuation range of natural background. In ranking in the World Association of Nuclear Operators (WANO), all performance indicators of China's operating nuclear power units are above the median level, with some units up to the world advanced level.

During the past 30 years, the key to making the above achievements in work of the NNSA is to carry forward the excellent traditions, summarize the advanced

experience, develop an effective mechanism and adhere to the following ten items:

Adhere to cultural leading. A proper perception and understanding is the prerequisite for right actions. The leading role of nuclear safety culture is always attached. Full play is given to the inspirational charisma, image leverage and moral obligation of nuclear safety culture to deepen the understanding of safety among employees and the public, and implement them as conscious actions. With persistent efforts, the nuclear safety culture has been introduced to China from abroad and taken root in our systems, industries and even the whole society.

Adhere to law-based administration. It is required to value the binding force of laws and regulations, adhere to manage the safety important activities according to law, and ensure the implementation of regulatory activities according to law. The law-based administration is insisted to ensure that all regulatory behaviors are authorized according to law. The regulation is conducted in strict accordance with laws.

Adhere to reliance on mechanisms. A set of mechanisms as to review, inspection, law enforcement, monitoring and emergency has been established based on the actual conditions of regulation. Full play has been given to such mechanism to coordinate the strengths of various parties and various elements, which ensures the regulatory efficiency and improves the regulatory effectiveness. Effective mechanisms such as full-process regulation, all-weather monitoring, and review with Party A & Party B role have provided effective guarantee for the efficient implementation of inspection and review.

Adhere to in line with international standards. With reference to international standards, China has established a set of nuclear and radiation safety regulation system that is in line with international standards and national conditions. By drawing on international practices, a comprehensive and effective nuclear and radiation safety regulation model has been established to ensure that the nuclear safety level of China is always consistent with the international advanced level. It is required to give play to late- development advantage, learn about borrowlism and fully learn lessons from the international advanced experience.

Adhere to problem-orientation. It is necessary to perform risk identification and risk source management; develop grading approach. Great importance is attached to experience feedback; comprehensive lessons are learned from accidents and events; safety improvements are proposed and implemented. Great importance is also attached to the investigation and processing of events and accidents. The events and accidents are deemed as an opportunity to identifying and solving problems. It is

important to get to the root of the problem so as to eliminate hidden dangers.

Adhere to strict management. The awareness of being strict is firmly fostered. It is necessary to adhere to the strict management. Strictness is the greatest support to the regulated party, and safety is the greatest benefit. It is required to insist on being strict with review, licensing, inspection and law enforcement. Strict precautions are taken from the outset; strict management is performed for the process; and severe punishment is implemented on consequences.

Adhere to continuous innovation. Innovation is the motivation. The theory innovation will promote the innovation of systems, mechanisms, methods and technologies to break the regulatory bottleneck. The new idea of reform and innovation is followed to promote the addressing of long-existing difficulties, hot issues and focus issues in such aspects as radioactive contamination, public communication and capacity building.

Adhere to consolidating foundation. Based on the people-oriented concept, it is required to foster a team of regulatory personnel with clear responsibilities and reasonable age structure; be committed to cultivating the capabilities in review and licensing, inspection, law enforcement, radiation monitoring, emergency response, experience feedback, technical research and development, public communication and international cooperation; attach great importance to the development of independent verification and validation calculation software; lay emphasis on the establishment of safety test verification platform and radiation environmental monitoring network.

Adhere to cooperation. It is required to advocate the harmony idea of work as a family towards a same goal and to create a firm, harmonious and lively working atmosphere. To achieve this, the first principle is to be strict. It is required to be highly disciplined, be prudent with behaviors and be strict with regulation. The second is to be harmonious. It is required to live in harmony, treat people with kindness and develop harmoniously. The third is to be progressive. It is required to make progress in work, ability and team.

Adhere to starting from myself. The regulatory body is required to set an example; be strict with itself, that is to be able to fulfill the requirements imposed on the regulated party; pursue excellence and set a good example so as to lead the entire industry in continuous improvement. It is necessary to be persistent with the goal and work all along the way till it is achieved.

The development goal of modernization of the national governance system and national governance capability was proposed at the Third Plenary Session of the 18th Central Committee of the Communist Party of China. The goal of “modernization of

nuclear safety regulatory system and capability" has also been established for the nuclear safety regulation as it is a part of the national governance system. To put it in detail, it is required to comprehensively put the rational, coordinated and balanced nuclear safety concept proposed by General Secretary Xi Jinping into practice, and implement the national safety strategy. A nuclear and radiation safety regulatory system with sound legal system, complete organizational structure, strong technical capabilities and rich spiritual culture has been established by reinforcing the four foundations and eight supports. Regarding nuclear safety, it is well equipped with the capabilities in nuclear safety review and licensing, inspection and law enforcement, radiation monitoring, emergency response, experience feedback, technical research and development, public communication and international cooperation, and provides a strong support for China to develop from a country with large nuclear capacity to that powerful in nuclear.

In order to realize the modernization of regulatory system and capacity, it is necessary to realize the modernization of the management ideas, methods and processes of the regulatory body in advance. The key is to ensuring the regulation with systematicness, scientificness, legalization, informanization and delicacy.

Therefore, the MEP (NNSA) has established and maintained an advanced and sound integrated management system within nuclear and radiation safety regulation system based on the latest safety standards of IAEA and good practice of international peers, commendations and suggestions from the IAEA Integrated Regulatory Review Service (IRRS) team and internal and external changes, and in combination with comprehensive sorting, analysis and review of existing regulations and systems, procedures and management practices, and identification and improvement of the elements and basic requirements of the integrated management system.

I hereby am committed to earnestly implement the duties endowed by the management system, authorize the Department of Nuclear Facility Safety Regulation to perform general planning, management and coordination for the management system, regularly organize and conduct the independent assessment and regulation, develop and take corresponding actions for identified issues in time, and modify and revise the documents and procedures of management system when necessary.

All relevant organizations and personnel participating in the nuclear and radiation safety regulation thoroughly implement the national nuclear safety concept, closely follow the national nuclear safety strategy, and aim at the development target of two modernizations to fully integrate the implementation of management system requirements. It is required to earnestly implement the requirements of the

management system, and strictly perform regulatory responsibilities so as to ensure quality of the regulation, comprehensively promote realization of the "two modernizations", and make our contribution to the great rejuvenation of Chinese nation and the construction of beautiful China.

Each regulatory staff is responsible and obliged to inherit the good traditions of systematic and normative management of regulatory works; report the deviations existing in the management system, continuously improve the management system; ensure the nuclear and radiation safety regulation is effective, fair, legal, credible and acceptable to the public; develop the MEP (NNSA) into a domestic authority and an international first-class nuclear and radiation safety regulatory body; and keep the nuclear and radiation safety regulation in China at the international advanced level.

Vice Minister of Environmental Protection
Administrator of NNSA

Li Ganjie

December 2015

Forward
(2016)
(2016 Edition)

Based on over thirty years of practices in nuclear and radiation safety regulation, the MEP (NNSA) has gradually developed a set of relatively complete regulatory concepts, ideas, methods and experience, which together constitute the integrated management system of the regulatory body. The manual has been prepared based on the summarization of the China's experience in nuclear and radiation safety regulatory practices and by reference to the IAEA safety standards. The manual systematically describe the integrated management system of NNSA, continuously innovate the management concepts and methods, optimize the management process, promoting the participation of all relevant personnel and continuous improvement, and provide all-round support for the modernization of regulatory system and capacity.

The manual comprehensively describes the policies, goals and plans, organization structures and their responsibilities, the development of nuclear safety culture, resources and management required by the implementation of regulatory duties, main activities and requirements of critical processes in the management system, and measures for continuous improvement of the management system. It covers all business areas and relevant activities, and provides all staffs of the regulatory system with clear working standard and basis, which is contribute to further improve the quality of the regulatory activities, enhance the authority and effectiveness of nuclear and radiation safety regulation, and continuously refine the nuclear and radiation safety regulatory system of China.

The manual covers the nuclear and radiation safety regulatory functions undertaken by the MEP (NNSA) and all relevant elements of management system; applies to all relevant departments/organizations of the nuclear and radiation safety regulatory system and their employees, including the headquarters, regional offices and technical support organizations. It is required to take the elements of safety, health, environment, security, quality, staff and organization, society, economy and health into comprehensive consideration to ensure that the principle of safety first, quality first is always implemented and the nuclear safety is given overriding priority.

As the management system of the MEP (NNSA) has been existing and operating for years, the planning and preparation of the documents of management system should not only be consistency with the existing rules and operation mechanism of the MEP (NNSA), but also provide top-level design for the management system and

improve the system. The documents should have a clear logic and defined requirements for the convenience of understanding and implementation, while highlighting the key points for the purpose of extracting and refining details and processes. It should ensure the overall planning and coordination working within the regulatory system while guaranteeing the alignment and relative independence of management system of each organization.

During the documents development for the nuclear and radiation safety management system, the process method advocated by the IAEA safety standard have been widely applied to ensure any activity can be considered as a process involving planning, implementation, assessment and continuous improvement. The management system consists of a set of interrelated process networks, and each process has an inherent logical relation with another. The management system should be continuously improved and perfected by identifying, controlling and assessing the results of the process and by making use of the obtained information and experience feedback to improve the process.

The development of this manual is mainly based on the requirements of the following documents:

- Relevant laws and regulations for nuclear and radiation safety in China;
- The current regulatory organization systems and document systems of the MEP (NNSA);
- IAEA GS-R-3 *The Management System for Facilities and Activities* and the guidelines;
- IAEA GSR Part 1 *Governmental, Legal and Regulatory Framework for Safety* and the guidelines;
- *The 13th Five-Year Plan and Prospective Plan of 2025 on Nuclear Safety and Radioactive Contamination Prevention and Control*, etc.

This manual can be used for the following purposes:

Organization culture manual: giving a whole description of the nuclear and radiation safety regulatory system: what kind of organization is the MEP (NNSA); what is it working on or going to work on; what are the mission, vision, core values and goals of the MEP (NNSA), etc. The mental cohesion is achieved and the consensus is reached within the entire regulatory system.

Employee manual and training materials for new employees: comprehensively clarifying the nuclear and radiation safety regulation and the internal comprehensive management of regulatory system; providing a road map and work instructions for implementation of management and technical activities: what should the MEP (NNSA) do; who undertake the job and how to do it. It is intended to make

the planning, management, implementation, assessment and improvement of activities be more systematic, scientific, standardized and effective.

Publicity materials: As the publicity and communication tool demonstrating the management commitments and efforts for ensuring the nuclear and radiation safety made by the MEP (NNSA) to the international peers and the public concerning China's nuclear and radiation safety regulation; fostering the image of China's nuclear and radiation safety regulator so as to raise the confidence and trust of the international community and the public in China's nuclear and radiation safety regulation.

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Contents

I. Overview

1.1 Introduction

The MEE (NNSA) is the nuclear and radiation safety regulatory body of China, which is fully responsible for the regulation of the national nuclear safety, radiation safety and the radioactive environment protection as well as the unified and independent regulation of national civil nuclear facilities and the application of nuclear technologies. It is ensured that the licensees carry out law-based nuclear activities through license review and approval, regulatory inspection, and regulatory monitoring.

The main duties and responsibilities of the MEE (NNSA) for nuclear and radiation safety regulation include:

(1) Responsible for regulation of nuclear safety and radiation safety, drafting out, organizing and implementing policies, programs, laws, administrative regulations, department rules, systems, standards and specifications relating to nuclear safety, radiation safety, electromagnetic radiation, radiation environment protection as well as nuclear and radiation accident emergency;

(2) Responsible for unified regulation of nuclear safety, radiation safety and radiation environment protection for nuclear facilities;

(3) Responsible for regulation of licensing, design, manufacture, installation and non-destructive testing(NDT) activities for nuclear safety equipment and the safety inspection of imported nuclear safety equipment;

(4) Responsible for control of nuclear materials and regulatory inspection and management of physical protection;

(5) Responsible for regulation of radiation safety and radiation environment protection of nuclear technology application projects, uranium (thorium) mines and associated radioactive mines, and taking charge of radiation protection;

(6) Responsible for regulation of safety and radiation environment protection of treatment and disposal of radioactive waste, and for supervisory inspection of radioactive contamination prevention and control;

(7) Responsible for regulation of safety transport of radioactive materials;

(8) Responsible for nuclear and radiation emergency response, investigation and treatment of the MEE (NNSA) and participation in prevention and handling nuclear and radiation terrorist event.

(9) Responsible for qualification management of reactor operators, special process personnel of nuclear equipment, etc.;

(10) Organizing and developing radiation environment monitoring and regulatory monitoring of nuclear equipment and key radiation sources;

(11) Responsible for taking the lead in the nuclear safety coordination mechanism;

(12) Responsible for domestic implementation of international conventions relating to nuclear and radiation safety;

(13) Directing relevant professional work in regional offices of nuclear and radiation safety inspection.

The NNSA was established in July 1984. Its development process can be divided into the following four stages:

(1) Stage of start-up and exploration (1984-1998)

The NNSA was formally established on July 2, 1984. Under the management of the State Scientific and Technological Commission, the regional offices of nuclear safety inspection have been successively established in Shanghai, Guangdong, Chengdu and the northern China. In addition, technical support organizations such as Beijing Nuclear Safety Review Center, Suzhou Nuclear Safety Center and Nuclear Equipment Safety and Reliability Technical Research Center of China Academy of Machinery Science and Technology Group Co., Ltd. have been established. In the principle of legislation first, the *Regulations on the Safety Regulation for Civil Nuclear Facilities* was issued for the establishment of regulation and standard system both in line with the international practices and the national conditions of China. In the principle of law-based administration, basic regulatory systems such as nuclear safety licensing system and regulatory inspection system have been established and implemented.

(2) Stage of integration and improvement (1998-2008)

In March 1998, the NNSA was integrated into the State Environmental Protection Administration. In 2003, China issued and implemented the *Law of the People's Republic of China on Protection and Control of Radioactive Pollution* which was the first law in the field of nuclear safety and radioactive pollution prevention and control. During this period, the China's nuclear safety regulatory system has become increasingly complete, six regional offices has been established, and the general pattern of nuclear safety regulation that covers the whole country has been formed. Technical support organizations such as Nuclear and Radiation Safety Center and Radiation Monitoring Technical Center have been newly established or upgraded. As

the technical strengths have been obviously expanded, a long-term and stable technical support team made up of more than ten scientific research institutes and universities, including China Institute for Radiation Protection, China Institute of Atomic Energy and Tsinghua University, have been established.

(3) Stage of rapid development (2008-2018)

In 2008, the State Environmental Protection Administration was upgraded to the MEP, known as the NNSA to foreign countries. In 2011, the functional department of the NNSA was expanded from one department to three. Great progresses were made in the construction of nuclear safety regulatory body. The functions were optimized; the team was expanded; the law and regulation system was getting perfected and the regulatory capacity and level were significantly improved.

(4) Era of nuclear and radiation safety regulation (2018-)

On January 1, 2018, the *Nuclear Safety Law of the People's Republic of China* was implemented, which reinforced the rule of law for optimizing the nuclear and radiation safety regulatory system and mechanism and further strengthening the independence, authority and effectiveness of regulation. In March 2018, the National People's Congress approved the *State Institutional Reform Plan* and integrated all functions of the original MEP and functions of other ministries and commissions related to pollution prevention and ecology protection to establish the MEE, known as NNSA to foreign countries, which was entrusted to regulate all kinds of pollution discharged to the ecology and the urban and rural areas and to execute the duties of law enforcement. The evolution from the MEP to the MEE is a significant action of the Party Central Committee representing the deepening of reform, and also a profound change and great progress made in the construction of ecological civilization.

After over 30 years of exploration and practice, the nuclear and radiation safety regulatory body started from the scratch, and has gradually established a set of nuclear and radiation safety regulatory system in line with the international practices as well as the national conditions of China. A nuclear and radiation regulatory team featuring devotion, professional competence, strict law enforcement and hard work has been established, with the headquarters of the MEE (NNSA) as the administrative core, the regional offices of nuclear and radiation safety inspection as the main force of regulatory inspection and nuclear and radiation safety center and radiation environment monitoring technical center as the main technical supports. By the end of 2017, as to the manpower of the nuclear and radiation safety regulatory team, there were about a hundred staffs in the headquarters, over one thousand personnel at the

central level and about ten thousands of personnel at the local level.

The geographical distribution of organizations of the nuclear and radiation safety regulatory body at the central level is shown in Figure 1-1.

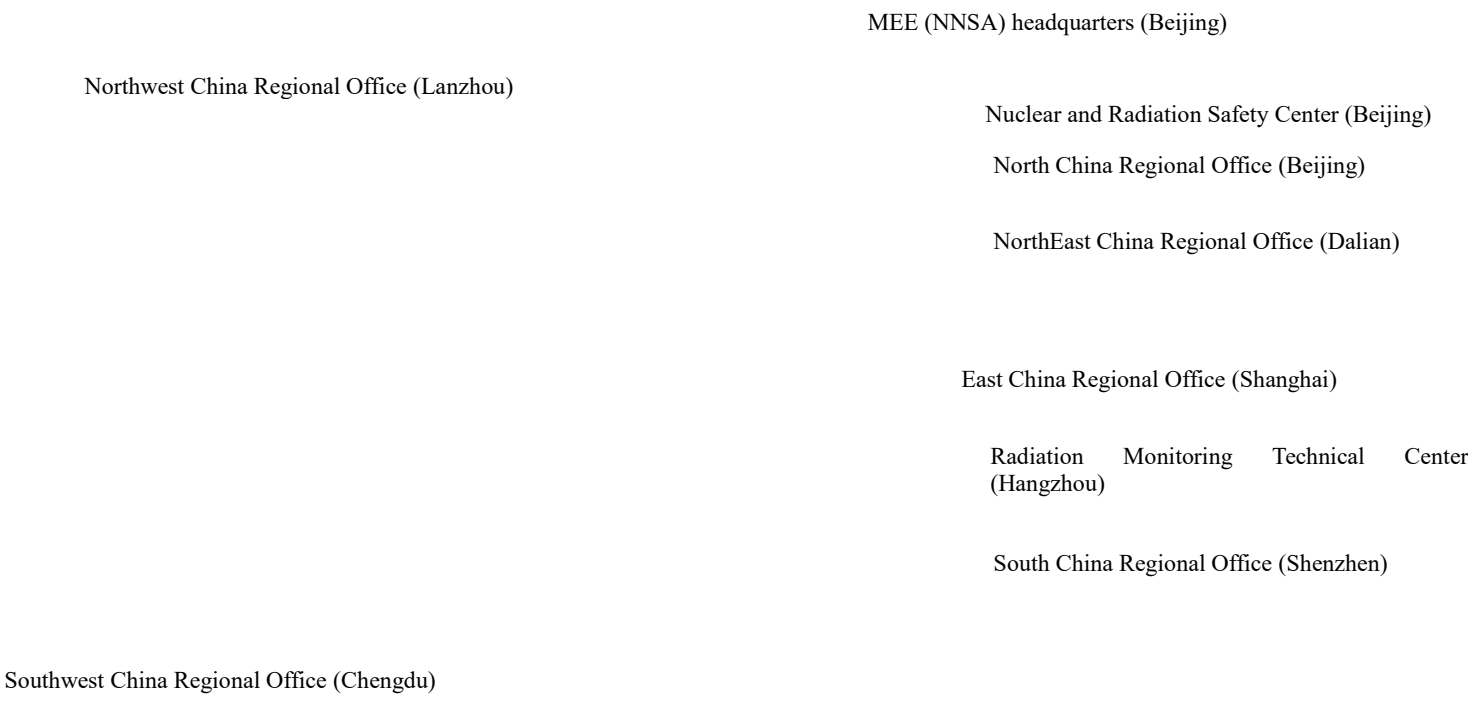


Fig.1-1 Distribution of Organizations of the Nuclear and Radiation Safety Regulatory body at the Central Level

1.2 Scope

Based on the authorization of laws and regulations as to nuclear and radiation safety, the MEE (NNSA) performs regulation of nuclear power plant, research reactor and critical facility, nuclear fuel cycle facility, radioactive waste, radiation source and radiation-emitting device, nuclear material, civil nuclear safety equipment, uranium (thorium) mine and associated mine, and construction projects of electromagnetic

radiation. The main regulatory activities include: nuclear and radiation safety review and licensing, nuclear and radiation safety inspection and law enforcement, review of environmental impact assessment (EIA) for nuclear and radiation project, on-site nuclear emergency response and radiation environmental monitoring, qualification management for key personnel related to nuclear and radiation safety, etc.

(1) Nuclear power plant

This refers to nuclear power plant designed for power generation or other heating applications. Safety regulation is performed for safety-related items and activities during the lifetime of the nuclear power plant, including its siting, design, construction, commissioning, operation and decommissioning.

(2) Research reactor and critical facility

This refers to nuclear reactors designed for research and other purposes that produce and use neutron flux and ionizing radiation, including reactor core, experimental facility, and all other facilities related to the reactor or experimental facility within the reactor site. Safety regulation is performed for safety-related items and activities during the lifetime of the research reactor and critical facility, including the siting, design, construction, commissioning, operation and decommissioning.

(3) Nuclear fuel cycle facilities

This refers to facilities for the production, processing, storage and reprocessing of nuclear fuel, including facilities for the uranium purification, uranium conversion, uranium enrichment, nuclear fuel element manufacturing, spent fuel storage away-from-reactor, reprocessing of spent fuel, and nuclear fuel cycle supporting facilities for radioactive waste disposal as well as nuclear fuel cycle test facilities. Safety regulation is performed for safety-related items and activities during the lifetime of the nuclear fuel cycle facilities, including the siting, design, construction, commissioning, operation and decommissioning.

(4) Radioactive waste

Radioactive waste is the waste which contains radionuclides or is contaminated by radionuclides whose concentration or specific activity is greater than the clearance level specified by national standard, and which is not expected to be reused. Licensing and safety regulation are performed for activities such as the handling, storage and disposal of radioactive waste. The licensing, review of EIA, radiation environmental monitoring and safety regulation are performed for siting and construction of solid radioactive waste disposal facilities.

(5) Radioisotope and radiation-emitting device

Licensing or registration management and safety regulation are performed for

activities including the production, sale, utilization, transfer, import and export of radioisotope and radiation-emitting devices. The radioisotope includes the radiation sources (solid radioactive materials permanently enclosed in containers or with tight enclosure excluding the materials of research reactor and power reactor nuclear fuel cycle) and unsealed radioactive materials. Radiation-emitting device refers to electric device that uses accelerated charged particles to generate a predetermined level, including X-ray machine, accelerator, neutron generator, etc.

(6) Nuclear materials

Licensing management and safety regulation are performed for activities such as the possession, utilization, production, storage, transportation and disposal of the following nuclear materials: uranium and uranium-bearing materials and products with the amount of uranium accumulatively added or produced greater than or equal to 0.01 effective kilogram(calculated by the amount of uranium in effective kilogram); any amount of plutonium-239 and materials and products containing plutonium-239; other nuclear materials subject to regulation specified by the administrative regulations.

(7) Civil nuclear safety equipment

This refers to the nuclear safety-related function equipment in nuclear facilities, including nuclear safety-related mechanical and electrical equipment. Licensing management and safety regulation are performed for activities including the design, manufacture, installation or NDT of civil nuclear safety equipment. The *Catalog of Civil Nuclear Safety Equipment* (2016 Revision) introduces the applicable nuclear safety equipment such as the nuclear power plant, research reactor, nuclear fuel cycle facility reprocessing plant. It is divided into the following major categories:

1) General nuclear safety equipment for nuclear facilities such as nuclear power plants and research reactors

Nuclear safety mechanical equipment: steel containment, containment steel lining, pressure vessel, storage tanks, heat exchangers, piping and fittings, pumps, internals, control rod drive mechanism, fans, compressors, valves, supports, bellows, expansion joints, gates, flanges, mechanical penetrators, castings and forgings, equipment modules, etc. for nuclear safety functions.

Nuclear safety (Class 1E) electrical equipment: sensors, cables, electrical penetrators, I&C system cabinets, power supply equipment, valve actuators, motors, transformers, switchgear and control equipment for nuclear safety functions.

2) Special nuclear safety equipment for nuclear fuel cycle facility reprocessing plant

Nuclear safety mechanical equipment: storage tanks, heat exchangers, pumps, valves, etc. for nuclear safety functions.

Nuclear safety (Class 1E) electrical equipment: sensor for nuclear safety functions.

(8) Transportation of radioactive material

It refers to materials containing radionuclides with activity and specific radioactivity whose levels are higher than the national specified exemption value, such as the radiation source, radioactive waste, spent fuel, etc. Licensing management and safety regulation are performed for activities including the transportation of radioactive materials as well as design and manufacture of transport containers of radioactive materials.

(9) Uranium (thorium) mine and associated radioactive mine

Review of EIA and radiation environmental monitoring is performed for the development and utilization of uranium (thorium) mine and associated radioactive ore or the closure of uranium (thorium) mine.

The associated radioactive ore mainly includes mine resources whose raw ore, intermediate products, tailings (slag) or other residues with more than 1 Bq/g of single nuclide of uranium (thorium) series, excluding uranium (thorium) mine.

(10) Electromagnetic radiation construction projects and equipment

Review of EIA and environmental electromagnetic radiation monitoring is performed mainly for construction projects and equipment including broadcasting station, transposer station, television tower, satellite uploading earth station, radar, telecommunications and power transmission and distribution project, etc.

1.3 Main Content and Scope of Application

This General Principles describes the basic requirements and measures for the establishment, implementation, assessment and continuous improvement of the management system within the nuclear and radiation safety regulatory body and is intended to clarify the structure and elements of nuclear and radiation safety management system in China; introduce the organizations, management duties, stakeholders and interfaces of the MEE (NNSA); effectively identify and manage various resources; plan and control the core and support processes, so as to ensure the effective and high-quality operation of management systems and provide powerful support to the MEE (NNSA) in performing its regulatory duties.

For the nuclear and radiation safety management system of China, the IAEA fundamental safety principles and safety standards have been followed; relevant

elements including safety, health, environment, security, quality, personnel and organization, society and economy have been comprehensively considered to ensure that the nuclear and radiation safety regulatory body always give the nuclear safety overriding priority during the inspection activities, such as development of nuclear safety regulations and standards, nuclear and radiation safety licensing, nuclear and radiation safety inspection and nuclear accident emergency.

This General Principles is applicable to the headquarters of MEE (NNSA), regional offices and main technical support organizations and applicable to all relevant activities of the management system.

1.4 Management Responsibility

The Administrator of NNSA is fully responsible for the establishment, implementation and maintenance of nuclear and radiation safety management system; the Department of Nuclear Facility Safety Regulation is specifically responsible for organizing the preparation of documents for the nuclear and radiation safety management system, regularly organizing evaluation for the implementation of the nuclear and radiation safety management system and modifying the documents of the nuclear and radiation safety management system when necessary; management personnel at all levels and all staffs of the MEE (NNSA) are responsible for following, implementing and executing all management regulations and requirements of the nuclear and radiation safety management system.

1.5 Terms and Definitions

(1) Nuclear safety

It is to take necessary and sufficient safety measures on prevention, protection, mitigation and regulation of nuclear facilities, nuclear activities, nuclear materials and radioactive materials, so as to prevent any technical issues, human factors or natural hazards from causing nuclear accidents, minimize the radiological consequences of nuclear accidents and protect workers, the public and the environment from undue radiation hazards.

(2) Nuclear safety culture

It is the assembly of the core values, behaviors and characteristics that have been agreed on and put into practice in individuals and organizations, to ensure protection of the public and the environment, with the fundamental principle of safety first, quality first.

(3) Nuclear facility

It refers to the nuclear power plants and installations including the nuclear power plant, nuclear thermal power plant, nuclear steam supply and heat supply plant; other reactors such as the research reactor, experimental reactor and critical installation except nuclear power plant; nuclear fuel cycle facilities for nuclear fuel production, processing, storage and reprocessing; and facilities for handling, storage and disposal of radioactive waste.

(4) Nuclear technology application

It refers to the application of the sealed radioactive source, unsealed radioactive source and radiation-emitting device in the field of medical treatment, industry, agriculture, geological survey, scientific research and teaching.

(5) Stakeholder

It refers to individuals or groups having a certain interest in nuclear and radiation safety, such as relevant government authorities, organizations or professionals under regulation, the media and the public, employees, owners and investors of the organization, suppliers and partners, relevant scientific groups and international organizations, relevant countries with cooperative relations or mutual influence, etc.

1.6 References

(1) Relevant laws ， regulations and standards for nuclear and radiation safety in China;

(2) IAEA GSR Part2 *Leadership and Management for Safety*;

(3) IAEA GS-R-1 *Legal and Governmental Infrastructure for Nuclear Safety, Radiation Safety, Radioactive Waste Safety and Transport Safety* and the series of guideline;

(4) IAEA IRRS report on the MEP (NNSA);

(5) *The 13th Five-Year Plan and Prospective Plan of 2025 on Nuclear Safety and Radioactive Contamination Prevention and Control*;

(6) The current rules and regulatory documents of the MEE (NNSA), etc.

The documents directly referred herein without a version number are the latest versions if there is no specific statement.

II. Management System

2.1 China Nuclear and Radiation Safety Regulation System

The nuclear and radiation safety regulation system of China includes the national laws, administrative regulations, ministry rules, guidance documents and other documents of regulatory requirements. The main composition is shown in Figure 2-1.

(1) Laws

It is prepared by the National People's Congress and its Standing Committee and enacted by the Order of the President, with legal effects higher than administrative regulations and ministry rules.

(2) Administrative regulations

It is prepared by the State Council according to the national laws and enacted by the Decree of the State Council, with legal force. The administrative regulations for nuclear and radiation safety specify significant items such as the nuclear and radiation safety regulatory scope, regulatory body and its duties and rights, regulatory principle and system, etc.

(3) Department rules

It is prepared by the relevant ministry of State Council in accordance with the laws and its administrative regulations within its authority scope, and enacted by the ministry order, with legal force.

(4) Guiding documents

It is prepared and enacted by the relevant ministry of State Council for explaining or supplementing nuclear safety requirements and recommending relevant methods or procedures.

(5) Other documents of regulatory requirements

It refers to other nuclear safety normative documents and nuclear safety technical documents that are prepared and enacted by relevant ministries of the State Council or the organizations entrusted by them, which provide an important reference for nuclear and radiation safety technology.

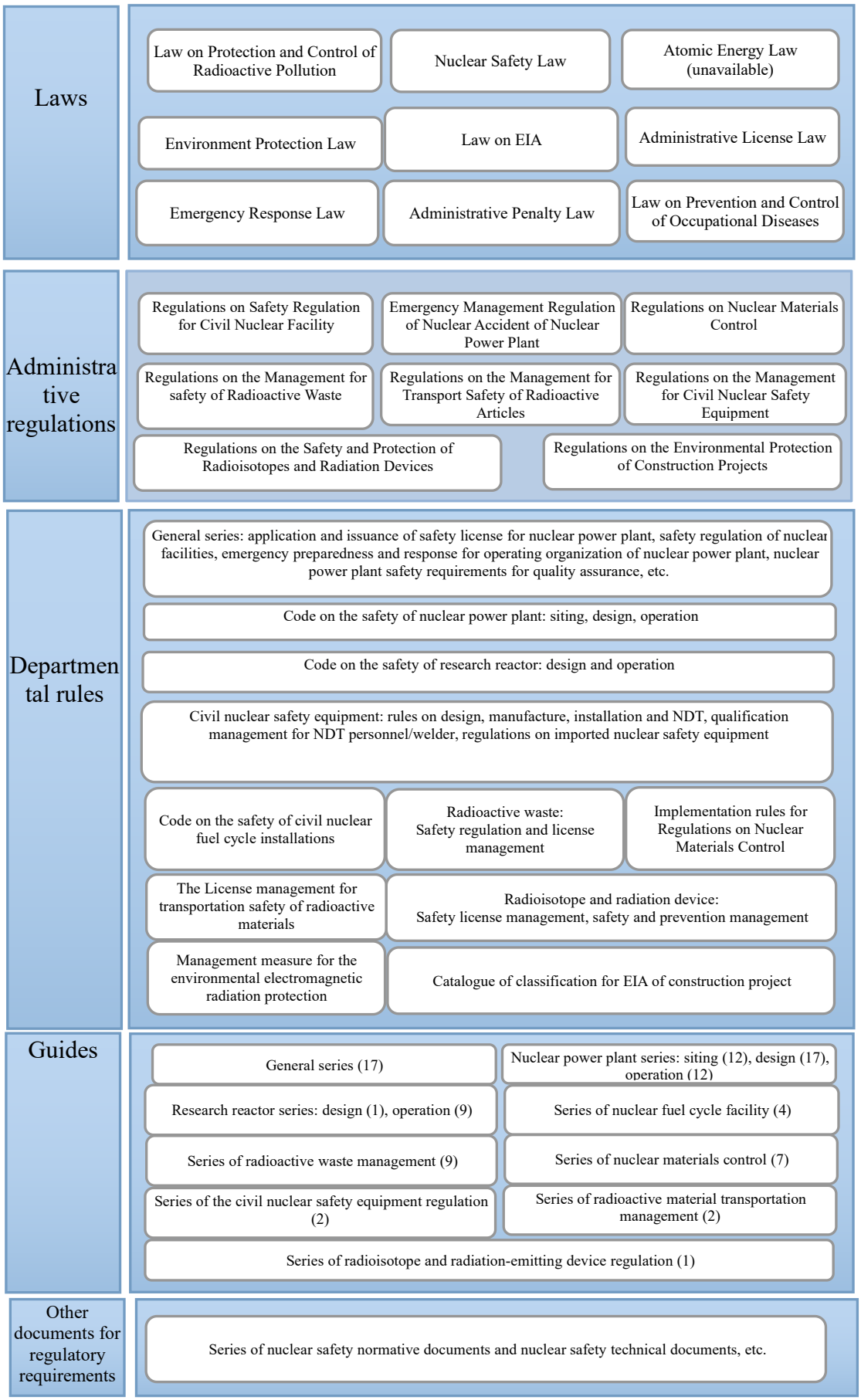


Fig. 2-1 Main Composition of Nuclear and Radiation Safety Regulation System

2.2 General Requirements for Management System

The MEE (NNSA) has established China's nuclear and radiation safety management system consistent with IAEA GSR Part2 and GS-R-1 and other relevant safety standards in accordance with laws and regulations of China and with reference to the general international practice. In this system, the process method is embodied, regulation concepts are implemented, nuclear safety culture is advocated, relevant activities are categorized and graded for the optimization of management and available resources the demands and expectations of stakeholders are met. It also provides methods and tools for the MEE (NNSA) to fully perform its nuclear and radiation safety regulation duties, carry out regulation activities with high quality, enhance the effectiveness and authority in regulation and accomplish its regulation mission. The constructional model of China's Nuclear and Radiation Safety Management System is shown in Figure 2-2.

Main tasks of the construction of China's Nuclear and Radiation Safety Management System include:

(1) Developing the vision, mission, goal and plan of the regulatory body;

(2) Advocating and fostering nuclear safety culture;

(3) Evaluating the satisfaction of interested parties;

(4) Defining the responsibilities and authorities of each activity or process;

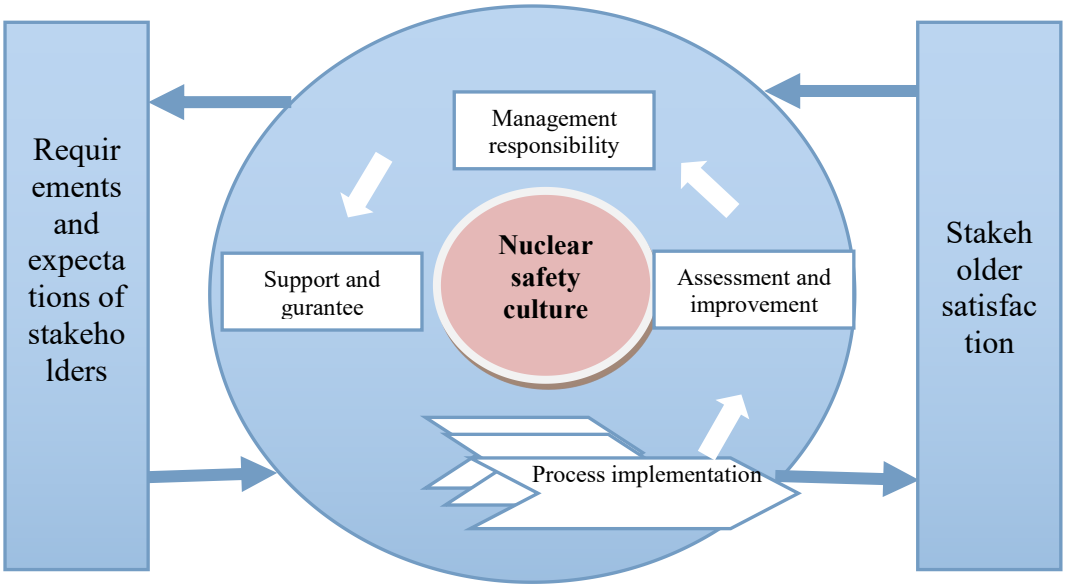
(5) Evaluating the current status of the management system;

(6) Developing documents for the management system;

(7) Identifying and describing all basic processes related to the regulatory activities;

(8) Developing and implementing the management procedures and working procedures;

(9) Performing the self-assessment and independent assessment of the management system.



2-2

Figure 2-2 The Constructional Model of China's Nuclear and Radiation Safety Management System

2.3 Management System Structure

The nuclear and radiation safety management system of China mainly consists of four parts: management responsibility, support and guarantee, process implementation, assessment and improvement. Figure 2-3 displays the detail structure of the management system, covering all nuclear and radiation safety regulatory activities of the MEE (NNSA).

(1) Management responsibility

In order to realize the organization mission, vision and core value, the MEE (NNSA) has published the policy, mission, vision, core value, safety objective, management principle and management commitment for nuclear and radiation safety; developed organization strategies and plans; defined the organization structure and responsibility; advocated nuclear safety culture, and paid attention to the needs of stakeholders. It is responsible for planning, establishing and implementing the management system, providing the required resources, and performing regular assessment and self-improvement.

(2) Support and guarantee

Sufficient resources and the effective management can provide powerful support and guarantee for the implementation, maintenance and improvement of the

management system, enhance the capacity building of regulatory body and continually increase the satisfaction of stakeholders. These resources include infrastructure working environment, human resources, information and knowledge, international cooperation, financial resources, scientific and technological research and development, suppliers and external technical support organizations. All categories of resources are properly planned to ensure the resources necessary for the implementation of regulation activities and improvement of the regulatory capacity.

(3) Process implementation

Process management is implemented, and the general management processes and core processes are planned, implemented, controlled and coordinated, to ensure the quality and effectiveness of all activities. Procedures are formulated for interrelated activities in processes, and stipulations are made on how activities should be transited and linked between different departments and be finally completed, to avoid overlapping, conflict or omission.

(4) Assessment and improvement

The monitoring and assessment system and self-improving mechanism of the management system are established through the self-assessment, internal and external independent assessment and experience feedback of managers at all levels, to build a learning organization, promptly identify problems and deficiencies existing in the management system, and realize continuous improvement.

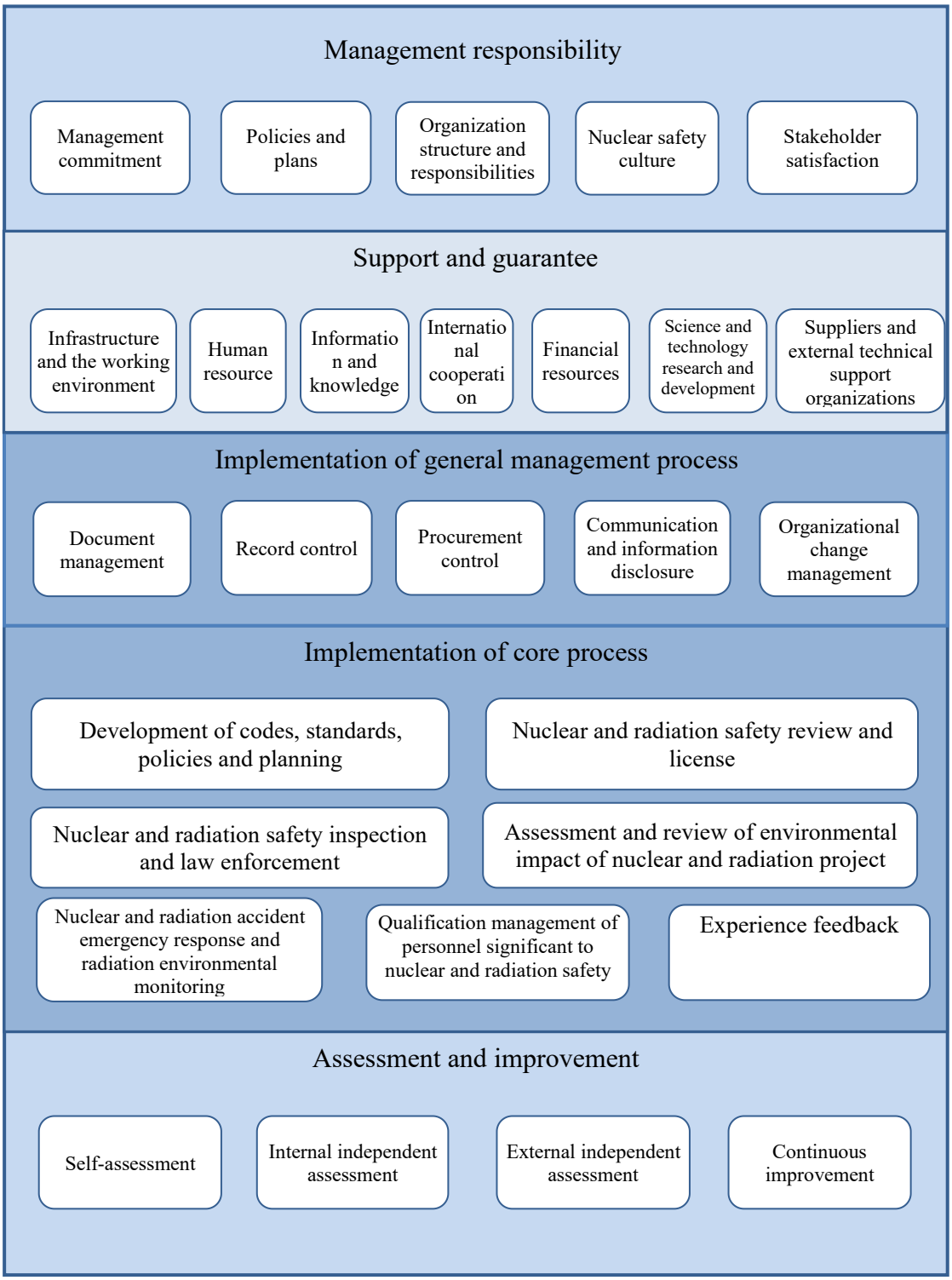


Figure 2-3 Diagram of China's Nuclear and Radiation Safety Management System Structure

2.4 Nuclear Safety Culture

The nuclear energy and nuclear technology application is the outcome of the development of modern civilization in human society. It brings benefits to human beings as well as risks. Nuclear safety is an important part of national security and the lifeline for the development of nuclear energy and nuclear technology application. Facing the rapid development of China's nuclear power and the increase of the public demands for safety, and in order to implement the national security strategy and carry out rational, coordinated and balanced nuclear safety concept, as well as perform the national nuclear safety responsibilities and international nuclear safety obligations, managers at all levels of the MEE (NNSA) attach more importance to the development of nuclear safety culture of the regulators and the regulated party, strive to create a good nuclear safety culture atmosphere in the entire industry and make use of the strength of the whole society to jointly enhance the nuclear safety.

The cultivation and practice of nuclear safety culture are embodied in the following aspects:

(1) Safety value and commitment of the decision-making level

The decision-maker level develops correct nuclear safety concept. The fundamental principle of safety first, quality first is always followed in the decision-making processes such as the determination of development goals, formulation of development plans, construction of management systems, establishment of the regulatory mechanisms and implementation of safety responsibilities; commitments are also made to ensure the safety goal.

(2) Attitude and model of the manager level

The manager level set itself as an example; exhibit behaviors to demonstrate the safety commitment; improve the accomplishment of the manager level in safety culture; establish and strictly perform the safety management system; implement the safety responsibilities; entrust the safety related positions with enough authority; provide adequate resources for the safety measures; and deal with safety-related issues with prudent and conservative attitudes.

(3) Personnel Participation and accountability

Individuals properly understand and demonstrate their own responsibilities for nuclear safety; make safety commitments and strictly perform the safety regulations so as to create a working atmosphere where everyone takes ownership for safety.

(4) Cultivation of a learning organization

Organizations develop systematic learning plans, actively carry out training, assessment and improvements, motivate learning, improve comprehensive skills of

employees, and create a learning atmosphere featuring inheritance, continuous improvement, guarding against arrogance, continuous innovation, pursuit of excellence, and self-transcendence.

(5) Construction of a comprehensive and effective management system

The government establishes and improves scientific and reasonable management system and strict regulatory mechanism; the operating organizations establish scientific and reasonable management system. It is ensured that safety is given overriding priority in the policy development, institutes set-up, resources allocation, plan development, progress arrangement and cost control.

(6) Creating a suitable working environment

It is required to set appropriate working hours and labor intensity; provide convenient infrastructure and physical conditions; establish an open and fair motivation and promotion mechanisms; strengthen the communication and resolve conflicts objectively and fairly; create a working atmosphere featuring mutual respect, high level of trust and cooperation.

(7) Establishing a mechanism for the questioning, report and experience feedback of safety issues

It is advocated to keep a serious questioning attitude towards safety issues; establish a mechanism that encourages all employees to freely report safety related issues and don't tolerate discrimination and retaliation. The managers response to and address potential issues and safety hazards reported by the employees in time; establish effective experience feedback system to prevent human errors in combination with case studies.

(8) Establishing harmonious public relationship

Public communication forms such as information release, public participation and science popularization are adopted to ensure the rights of the public to know, to participate and to supervise; the decision-maker level and the manager level keep open mind to listen to various opinions from multiple channel and properly deal with the demands of stakeholders.

The principles and requirements of the nuclear safety culture construction are fully considered in the planning and implementation of internal management and regulatory activities performed by relevant departments/organizations of the MEE (NNSA), and are implemented through the following measures:

- Adhering to law-based administration and performing safety regulation strictly so as to ensure the independence, authority and effectiveness of nuclear safety regulation;

- Implementing the independent, open, law-based, rational and effective regulatory concept and the strict and prudent work style;
- Issuing the *Traits of Nuclear Safety Culture*; detailing the requirements for nuclear safety culture cultivation; regularly conducting the internal and external training of nuclear safety culture, experience exchange, self-assessment and peer review;
- Developing relevant policies encouraging the cultivation of safety culture; strengthening the policy guidance and regulation; establishing the mechanism for cultivating nuclear safety culture; continuously strengthening the awareness of rule of law, responsibility, risk and integrity; creating a culture atmosphere to pay attention to nuclear safety;
- Keep deepening the international exchange and cooperation; earnestly performing the obligations in conventions; implementing the nuclear safety commitments; facing the nuclear risks together with the international communities to improve the global nuclear safety level.

2.5 Grading Approach

In order to rationally allocate resources and improve the effectiveness and efficiency of the management system, departments and organizations of the MEE (NNSA) perform grading approaching approach for the processes and relevant activities under their charge. For the determined processes/activities, corresponding control and verification methods or levels are specified so that processes/activities with high significances and risks can be controlled from a high level, avoiding improper regulation or lack of regulation due to unreasonable resource allocation.

2.5.1 Grading Principles and Requirements

For the grade of a specific process/activity, main factors to be considered include the importance of the regulated items/activities to safety and reliability, and the potential risks, consequences and extent of harm of processes/activities to aspects such as safety, health, environment, security and quality. Other factors to be considered include the sufficiency and performance history of personnel, experience and technical information; the complexity, maturity, uniqueness and standardization of items/activities; the degree of items/activities passing the inspection and tests for verification; and the accessibility of the inspection, test, maintenance and normal operation.

The grading approach of specific processes/activities is specifically considered in the regulations, standards, and management system documents through the following aspects:

- Main entity, level and authorization grade of regulation;
- Method, depth, range and approval authority as to the document/activity review or verification;
- Method, frequency, depth and range of inspection;
- Required scope and level of detail of procedures and rules;
- Requirements for personnel training, qualification and authorization;
- Qualification, licensing scope and authority of organizations;
- Types and quantity of records for retention, etc.

2.5.2 Main Classification and Grading

(1) Classification and grading of nuclear facilities

According to the *Nuclear Safety Law of the People's Republic of China*, nuclear facilities are divided into four categories. Regulatory resources are reasonably allocated based on the significance, risk level and safety status of different kinds of nuclear facilities.

- Nuclear power plants and installations such as nuclear electrical power plants, nuclear thermal power plants, nuclear steam supply and heat supply plants;
- Other reactors such as research reactors, experimental reactors, and critical facilities other than nuclear power plants;
- Nuclear fuel cycle facilities such as facilities for nuclear fuel production, processing, storage and reprocessing;
- Facilities for the handling, storage and disposal of radioactive waste.

A. Classification and grading of items in nuclear power plant

For nuclear power plants, different safety classes and anti-seismic categories are divided for structures, systems and components (SSCs) according to their safety significance and potential risks. The safety class is divided downward into four levels: Safety Class 1, Safety Class 2, Safety Class 3 and Non-safety Class. The anti-seismic category is divided into Anti-seismic Category I and Anti-seismic Category II. Items of Anti-seismic Category I are able to bear the load of safe shutdown earthquake; and items of Anti-seismic Category II are able to bear the load of operational basis earthquake. For items with high safety class or seismic category, higher design requirements and safety margins are required, and stricter quality control and

verification are performed during subsequent manufacturing, installation, commissioning and operation.

B. Classification and grading of research reactors

The research reactor is divided into three categories in consideration of the potential source intensity, safety features and radioactive release consequences:

- **Class I research reactor**: there is no sealing requirement for the reactor building. For Class I research reactor, the Safety Objectives specified in section 2.1 of *Code on the Safety of Research Reactor Design* (HAF201) are not violated in the case of the exposure of core or spent fuel to the atmosphere caused by building collapse or the loss of normal sealing of reactor pool and other enclosure structures, and in the case of severe rupture of the core fuel.
- **Class II research reactor**: there is no sealing requirement for the reactor building. For Class II research reactor, the Safety Objectives specified in section 2.1 of *Code on the Safety of Research Reactor Design* (HAF201) are not violated whenever the building does not collapse, the normal sealing of reactor pool or other enclosure structures is not lost, and no large debris falls onto the fuel element or core.
- **Class III research reactor**: The Safety Objectives specified in section 2.1 of *Code on the Safety of Research Reactor Design* (HAF201) are met only in the case of that the normal integrity and sealing of the reactor building or enclosures, core or containers or other enclosure structures are not lost.

C. Classification and grading of nuclear fuel cycle facilities

According to reasonable and simplified method, the nuclear fuel cycle facilities are divided into the following four categories based on the total amount, form, potential accident risk or consequence of radioactive materials:

- **Class I (high risk):** facilities with potential risks or consequences of significant off-site radiation, including reprocessing facilities, facilities for centralized handling and storage of high level radioactive liquid waste, etc.
- **Class II (moderate risk):** facilities with potential risks or consequences of significant on-site radiation and high level of criticality hazard, such as facilities for spent fuel storage away-from-reactor and manufacturing facility for mixed oxide (MOX) elements, etc.
- **Class III (low risk):** facilities with potential risks or consequences of significant on-site radiation or criticality hazard, such as uranium enrichment facilities, uranium fuel element manufacturing facilities, low and

intermediate level radioactive liquid waste handling facilities and storage facilities, etc.

- **Class IV (conventional risk):** facilities only with on-site radiation risks or consequences or with conventional industrial risks, such as natural uranium purification/conversion facilities and natural uranium heavy-water reactor element manufacturing facilities, etc.

(2) Classification and grading of radiation-emitting devices

The radiation-emitting devices are divided into Class I, Class II and Class III based on the degree of potential hazard of radiation-emitting devices to people health and the environment.

- **Class I radiation-emitting device:** It is the device that may cause severe radiation injury to the personnel being exposed in a short time in case of accident. The safety and protection requirements are high;
- **Class II radiation-emitting device:** It is the device that may cause relatively severe radiation injury to the personnel being exposed in case of accident. The safety and protection requirements are relatively high;
- **Class III radiation-emitting device:** It is the device that normally does not cause radiation injury to the personnel being exposed in case of accident. The safety and protection requirements are relatively simple;

(3) Classification and grading of radioactive source

It is divided downward into five categories based on the degree of potential hazard of radioactive source to people health and the environment:

- **Class I (extremely risky source):** This source could possibly be fatal to be close to it for a period in the range of a few minutes to an hour without protection.
- **Class II (highly risky source):** This source could possibly be fatal to be close to it for a period of hours to days without protection.
- **Class III (risky source):** This source could cause permanent injury to human who was in contact with it for some hours, and it could possibly be fatal to be close to the source for a period of days to weeks without protection.
- **Class IV (low risky source):** It is very unlikely that anyone would be permanently injured by this source. However, recoverable temporary injure may be caused for the human that was closely in contact with the source for many hours.
- **Category V (extremely low risky source):** It is very unlikely that anyone

would be permanently injured by this source, and the lower limit activity is the exemption activity of this nuclide.

The workplace of unsealed source is divided into Class A, Class B and Class C based on the maximum equivalent daily handling quantity of radionuclide. The safety management of Class A workplace of unsealed source, refer to that of Class I radioactive source. The safety management of Class B and Class C workplace of unsealed source refer to that of Class II and Class III radioactive source.

(4) Classification and grading of radioactive waste

The radioactive waste is divided into five categories, namely very short lived waste, very low level waste, low level waste, intermediate level waste and high level waste, where very short lived waste and very low level waste belong to the scope of low level waste.

- **Very short lived radioactive waste:** the main radionuclide contained in the wastes has a short half-life, and the activity concentration of long-lived radionuclide is beneath the clearance level. The half-life of radionuclide with very short life is normally less than 100 days. After at most several years of storage and decay, the activity concentration of the radionuclide will fall beneath the level for clearances, allowing for clearance.
- **Very low level radioactive waste:** the activity concentration of radionuclide in the waste is close to or slightly higher than the exemption level or clearance level. The activity concentration of the long lived radionuclides is quite limited. Only limited containment and isolation measures are required. It can be disposed by the surface landfill facility or disposed on the landfill site for industrial solid waste according to the national regulation for management of industrial solid waste.
- **Low level radioactive waste:** the activity concentration of short lived radionuclide in the waste can be relatively high; the content of long-lived radionuclide is limited, which requires hundreds of years of containment and isolation. It can be disposed in the near surface disposal facility with engineering barriers, typically from the surface down to 30 meters.
- **Intermediate level radioactive waste**: It is defined as waste that contains long lived radionuclides in quantities, especially radionuclide that emits alpha-particle, that need a greater degree of containment and isolation from the biosphere than is provided by near surface disposal and can’t be relied on monitoring measures to ensure the safety disposal of wastes. Disposal in a facility at a depth of between a few tens and a few hundreds of meters is

indicated. Normally, it is not required to provide heat dissipation measures during the storage and disposal of intermediate level waste.

- **High level radioactive waste:** the activity and concentration of radionuclide contained in the waste is very high, generating significant quantities of heat from radioactive decay; or there is a large amount of long lived radionuclide contained in the waste, which requires a greater degree of containment and isolation, and heat dissipation measures. The deep geological disposal shall be taken.

(5) Classification and grading of radioactive materials

In consideration of the transport of radioactive materials and the design, manufacture, etc. of the transport containers, radioactive materials are divided into three categories according to the characteristics of radioactive materials and their potential hazard to people health and the environment:

- **Class I radioactive materials:** It is defined as that release to the environment will cause significant radiation hazard on people health and the environment, such as the Class I radioactive sources, high level waste and the spent fuel.
- **Class II radioactive materials:** It is defined as that release to the environment will cause ordinary radiation hazard on people health and the environment, such as Class II and Class III radioactive sources, intermediate level waste.
- **Class III radioactive materials:** It is defined as that release to the environment will cause minor radiation hazard on people health and the environment, such as Class IV and Class V radioactive sources, low level waste, radioactive chemicals.

(6) Classification and grading of nuclear events and radioactive events

In accordance with the IAEA *International Nuclear and Radiological Event Scale*, the nuclear and radiological events are divided into 7 levels based on the impacts on people and the environment, radiological barriers and controls as well as defense-in-depth, where Level 1 to Level 3 are defined as incidents and Level 4 to Level 7 are defined as accidents. Event not involving safety significance is defined as Level 0 and expressed as deviation.

- **Level 1 event:** Anomaly. Overexposure of a member of the public in excess of statutory annual limits. Minor problems with safety components with significant defence-in-depth remaining. Low activity lost or stolen radioactive source, device or transport package.

- **Level 2 event:** Incident. Exposure of a member of the public in excess of 10 mSv. Exposure of a worker in excess of the statutory annual limits. Radiation levels in an operating area of more than 50 mSv/h. Significant contamination within the facility into an area not expected by design. Significant failures in safety provisions but with no actual consequences. Found highly radioactive sealed orphan source, device or transport package with safety provisions intact. Inadequate packaging of a highly radioactive sealed source.
- **Level 3 event**: Serious incident. Exposure in excess of ten times the statutory annual limit for workers. Non-lethal deterministic health effect from radiation. Exposure rates of more than 1 Sv/h in an operating area. Severe contamination in an area not expected by design, with a low probability of significant public exposure. Near-accident at a nuclear power plant with no safety provisions remaining. Lost or stolen highly radioactive sealed source. Misdelivered highly radioactive sealed source without adequate procedures in place to handle it.
- **Level 4 accident:** Accident with local consequences. Minor release of radioactive material unlikely to result in implementation of planned countermeasures other than local food controls. At least one death from radiation. Fuel melt or damage to fuel resulting in more than 0.1% release of core inventory. Release of significant quantities of radioactive material within an installation with a high probability of significant public exposure.
- **Level 5 accident:** Accident with wider consequences. Limited release of radioactive material likely to require implementation of some planned countermeasures. Several deaths from radiation. Severe damage to reactor core. Release of large quantities of radioactive material within an installation with a high probability of significant public exposure. This could arise from a major criticality accident or fire.
- **Level 6 accident:** Serious accident. Significant release of radioactive material likely to require implementation of planned countermeasures.
- **Level 7 nuclear accident:** Major accident. Major release of radioactive material with widespread health and environmental effects requiring implementation of planned and extended countermeasures.

The nuclear emergency situations are classified into the following four scales based on the accident status, consequences and potential hazards:

- **Emergency standby:** In case of some specific conditions or external events

that may endanger the safety of nuclear power plants, relevant personnel of the nuclear power plants will be on standby.

- **Plant emergency:** the accident consequences are confined within a partial area of the nuclear power plants. Personnel in the plant will take emergency response action according to the on-site emergency plan and relevant off-site emergency organizations will be notified.
- **On-site emergency:** the accident consequences are limited to the site. On-site personnel will take emergency response actions; off-site emergency organizations will be notified, and some off-site emergency organizations may also take emergency response actions.
- **Off-site emergency:** the accident consequences have gone beyond the site boundary. Both on-site and off-site nuclear emergency plans will be implemented.

(7) Classification and grading of radiation accidents of radioisotope and radiation-emitting device

The radiation accidents are divided into four levels based on the accident source term, consequence and damage:

- **Extra major radiation accident:** Class I and Class II radioactive source is lost, stolen or out of control, causing large area of serious radiation contamination; or the loss of control of radioisotope and radiation-emitting device results in acute death of more than 3 people (included).
- **Major radiation accident:** Class I and Class II radioactive source is lost, stolen or out of control, or the loss of control of radioisotope and radiation-emitting device results in acute death of less than 2 people (included) or severe radiation sickness and partial disability of more than 10 people (included).
- **Relatively major radiation accident:** Class III radioactive source is lost, stolen or out of control, or the loss of control of radioisotope and radiation-emitting device results in severe radiation sickness and partial disability of less than 9 people (included).
- **Ordinary radiation accident:** Class IV and V radioactive source is lost, stolen or out of control, or the loss of control of radioisotope and radiation-emitting device results in personnel exposure exceeding the annual dose limit.

(8) Classification and grading of other aspects

The other classification and grading of the management system activities mainly

include:

- Process management for management system: it is divided into general management process and core process, etc. Great importance is attached to core process with more manpower and regulation sources as well as stricter management control.
- Document and record control: the graded approval and control is implemented in accordance with the document importance. The centralized archiving is performed for important reports and relevant records of regulation activities.
- Organizations for nuclear safety equipment: the MEE (NNSA) performs licensing management for organizations as to the design, manufacturing, installation and NDT of the important nuclear safety equipment.
- Qualification of personnel in important safety positions: personnel in positions important to safety such as the operation, quality assurance, radiation protection and radiation environmental monitoring of the nuclear facility operating organization shall pass the training and qualification of nuclear safety engineer; the reactor operator are need to be examined and be issued the license. For personnel working on the welding and NDT of civil nuclear safety equipment, the qualification test shall be performed and the certificate shall be issued.

2.6 Management System Documentation

China's nuclear and radiation safety regulation system is the most important for the MEE (NNSA) performing its regulatory duties. The preparation and implementation of China's nuclear and radiation safety regulation system documents are based on and in line with the requirements of relevant laws, regulations and standards of China for nuclear and radiation safety.

Department of Nuclear Facility Safety Regulation is responsible for the centralized management of the overall planning, preparation organizing, coordination, regular assessment and improvement of the management system documents. Other professional departments, regional offices and technical support organizations are responsible for preparing documents required within their areas of responsibility and effectively implementing the requirements specified in the management system documents. The framework of China's Nuclear and Radiation Safety Management System is indicated in Figure 2-4. The structure of system documents is detailed in Appendix 1.

The regional offices and technical support organizations prepare the internal management procedures, implementation procedures or work instructions in accordance with the requirements of the nuclear and radiation safety management system documents and in consideration of the actual situations of their own departments and organizations. The management system documents of all levels shall be coordinated and self-consistent, and shall be as concise, clear and easy to understand and use as possible.

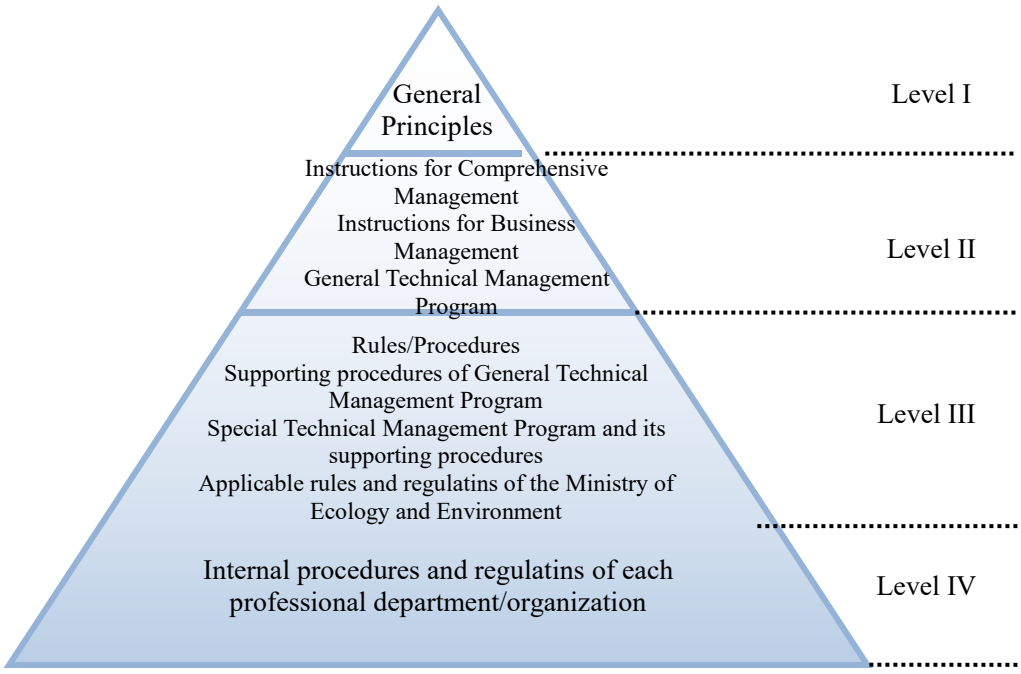


Fig.2-4 Framework of China's Nuclear and Radiation Safety Management System

III. Management Responsibility

3.1 Management Commitment

Senior managers of the MEE (NNSA) are responsible for developing the mission, vision, core value, policy and planning, annual goals and plans, and guiding employees at all levels to effectively and efficiently perform activities by establishing and effectively operating the management system, so as to continuously improve the work quality, professional competence and work efficiency of nuclear and radiation safety regulation, and better fulfill the responsibilities of nuclear and radiation safety regulation endowed by laws and regulations.

Senior managers of the MEE (NNSA) fulfill their commitments to management by taking the following measures:

- Determining the management policies and action goals;
- Highlighting the significance of safety and safety culture;
- Highlighting the proper relationship between the MEE (NNSA) and stakeholders and paying attention to their demands and expectations;
- Ensuring that employees attach importance to their own capabilities and understand the management policies of the MEE (NNSA);
- Active recruitment policy;
- Mechanism of excitation, education and training for employees;
- Continuous assessment and improvement of the management system;
- Providing necessary resource.

Senior managers of the MEE (NNSA) provide chances for employees at all levels to participate in the development of policies and goals, appointment of personnel of significant positions, significant regulation decision-making, allocation of project and resources and the development and maintenance of management system, for the purpose of continuously improving the management system and realizing the commitment of the MEE (NNSA). All employees must abide by the mission, vision, core value, policy and planning, annual goals and plans of the MEE (NNSA) and take their own responsibilities for achieving the corresponding goals.

3.2 Mission, Vision and Core Value

(1) Mission

It is required to implement strict and effective whole-process safety regulation

for nuclear facilities, nuclear activities, nuclear materials and radioactive materials to protect the workers, the public and environment from the harmful radiation hazard and realize the high level nuclear and radiation safety.

(2) Vision

It is required to implement the principle of safety first, quality first to ensure that the nuclear and radiation safety regulation is forceful, fair, reasonable, credible and acceptable to the public, so as to keep the nuclear and radiation safety regulation in China at the international advanced level.

(3) Core value

Independence, openness, law-based, rationality and effectiveness

Independence refers to that the regulatory body is independent from any other authority or organization relevant to nuclear energy and the development and application of nuclear technology; have adequate legal rights to perform regulation duties; have sufficient human resources with required qualification, experience and expertise; and have the financial resources, regulation methods and capabilities required by regulation. Its decision-making is mainly based on the objective consideration of technical factors as to nuclear safety rather than the restriction and interference of political, economic and benefit factors.

Openness is that timely release the information concerning the public such as the nuclear regulation requirements and bases, significant regulation activities and results, radiation environmental monitoring data, nuclear and radiation accident emergency information; widely ask for the opinions of the industrial peers and the public before making significant regulation decisions; keep the transparency of the whole nuclear and radiation regulation process and make scientific decisions to improve the public confidence and trust in nuclear safety regulation.

Law-based is to establish and improve a nuclear safety regulatory standard system suitable for China's national conditions with reference to the latest international nuclear and radiation safety standards and in consideration of specific realities of China. It is required to perform law-based administration and strict regulation according to the requirements of laws and regulations and technical standards for nuclear safety. For behaviors and items violating the regulations, the regulated party is required to make corrective actions in time. Law enforcement actions such as cancellation of licenses and issuance of Stop Work Order are taken decisively for major violations. There is no tolerance for bad conducts such as fraud and false reporting.

Rationality is to comprehensively recognize the specialty and objective laws of

nuclear energy and nuclear technology and to uphold the rational, coordinated and balanced nuclear safety concept. Under the premise of ensuring nuclear safety, it is required to develop regulation requirements including the nuclear safety policies, laws, regulations and technical standards; set reasonable and feasible safety goals; and take strict regulation measures to promote the healthy, stable and sustainable development of nuclear energy and nuclear technology application.

Effectiveness is to establish and continuously improve the management system of the regulator in accordance with the international standards and good practices, strengthen the building of regulation talents, regulation facilities and equipment and technical capabilities; innovate the regulatory technical methods, strengthen the technical depth of safety review and inspection, improve and optimize the nuclear safety management mechanism, improve the authority and effectiveness of regulation, and continuously improve the nuclear safety management level.

3.3 Safety Goal and Regulatory Principle

The Chinese government attaches great importance to nuclear safety and has organized comprehensive safety inspections after the Fukushima nuclear accident, and implemented safety improvements. President Xi Jinping put forward the rational, coordinated and balanced nuclear safety concept. The nuclear safety was included into the national general safety system and recorded in the *National Security Act*. In 2016, the former MEP (NNSA) organized the industry experts to deeply analyze the current nuclear safety status of China, issued the *13th Five-Year Plan and Prospective Plan of 2025 on Nuclear Safety and Radioactive Pollution Prevention and Control* jointly with relevant ministries and commissions and clearly put forward the safety goals and regulation principles of nuclear facilities and nuclear activities by focusing on the development trend of nuclear safety in a future period, with risk prevention and control as the core, administration by law as the fundamental, nuclear safety culture as the guidance, reform and innovation as the driving force and capacity building as the support.

3.3.1 Safety Goal

General goal

The safety level of nuclear facilities in operation and under construction is obviously improved; the safety of nuclear power is kept at the international advanced level; the radiation accident rate for radioactive source is further reduced; remarkable

effect in decommissioning of early nuclear facilities is achieved; there is no nuclear accident with radioactive contamination to the environment; the quality of radiation environment is good; the nuclear emergency capability is strengthened; the nuclear safety regulation level is greatly improved; the nuclear safety, environment safety and public health are effectively guaranteed.

Prospective goal

The safety of nuclear power plants is maintained at the international advanced level; the safety of other nuclear facilities reaches the international advanced level; the radiation accident rate for radioactive source is kept at relatively low level; great progress is made in the decommissioning of early nuclear facilities; safety processing and disposal are timely performed for radioactive wastes; the quality of radiation environment is continuously kept at a good level. The modernization of nuclear and radiation safety regulatory system and regulatory capabilities is realized. Nuclear safety, environment safety and public health are under continuous and effective guarantee.

In consideration of general goals and prospective goals, specific goals and key tasks have been proposed for the improvement of nuclear facility safety level, nuclear technology application device safety level and radioactive contamination prevention level, safeguards, emergency response and safety regulation, etc., with supporting engineering projects and guarantee measures provided.

3.3.2 Regulatory Principle

Law-based nuclear governance and strict regulation. It is required to improve the nuclear safety legal system, perfect the laws and regulations and perform strict law-based regulation. It is required to insist on being strict with review, licensing, inspection and law enforcement. Strict precautions are taken at the source; strict management is performed for the process; and severe punishment is imposed on behaviors violating the regulations.

Prevention first and defense-in-depth. It is required to strengthen technical and management methods, guarantee the effectiveness of all kinds of defensive measures and integrity of multiple barriers of nuclear facilities; effectively prevent nuclear accident and mitigate the accident consequences to ensure that it will not cause unacceptable impact on the public and environment.

Treatment of both symptoms and root causes and continuous improvement. It is required to pay attention to both old and new issues; comprehensively deal with the decommissioning of early nuclear facilities and the disposal of long-existing

radioactive waste; construct various nuclear facilities according to the latest standards; improve the current safety level of the facilities; and reduce the generation of wastes from the source. It is required to fully learn from the international and domestic experiences, continuously perform the assessment and improvement and keep improving the safety performance.

Reform and innovation, taking into account both domestic and international development. It is required to deepen the management system reform and administrative licensing reform; improve the effectiveness of nuclear safety governance; promote the scientific innovation of nuclear safety; and reinforce the scientific and technological support. The domestic nuclear safety is ensured while the international cooperation for nuclear safety is strengthened.

Be open and transparent; cultural guidance. It is required to insist on the requirement of supervised by the central authorities, directed by the local authorities, performed by the enterprises and participated by the public; implement the responsibilities; improve the mechanisms; strengthen the public communication; and guarantee the public right to know and participate by law. It is required to insist on improving the safety level under the drive of nuclear safety culture development; promote the nuclear practitioners to take China's nuclear safety concept as the basic value.

3.4 Organizational Policies and Planning

3.4.1 Organizational Policies

(1) Independent regulation

The MEE (NNSA) is directly under the management of the State Council, without any administrative affiliation relationship with the nuclear development departments. Expenses for the organization operation are fully included into the national financial budget to ensure the organizational independence of regulation. There is no direct interest between the external technical support organization or external experts and the regulated parties.

(2) Strategy of organizational setup

A regulatory organization system with the headquarters of the MEE (NNSA) as the administrative core, the regional offices as the main force for regulatory inspection and Nuclear and Radiation Safety Center and Radiation Monitoring Technical Center as the main technical supports has been established. The grading approach, professional operation, unified dispatch and strict inspection have been performed.

(3) Mechanisms of Decision

The graded authorization, law-based decision-making, scientific decision-making and democratic decision-making are performed to ensure the consistence, coordination and authority of the decisions. Before major decisions are made, it is required to perform survey and investigation, expert discussions and group discussions and listen to the opinions and suggestions of relevant departments, experts and the public through symposiums, demonstration meeting, hearing, public announcement, etc. It is required to disclose the government affairs so as to improve the regulation transparency and credibility.

(4) Policy of human resource

It is required to strictly control the quality of recruitment, reasonably arrange the staff echelons and professional structures. Multiple channels of professional training and career development are provided; job rotation is encouraged to promote the balanced mobility of personnel. A position is defined by its responsibilities and the; responsibilities and rights are consistent; the labor division is reasonable to reduce the interface. It is required to openly and fairly select and cultivate ranks of official with both ability and moral integrity.

(5) Policy of international cooperation

It is required to participate in the multilateral, bilateral and regional international exchanges and cooperation in the area of nuclear and radiation safety regulation with a candid and open attitude, learn from the international advanced experience and enhance the mutual understanding and support. It is required to take the international responsibility, establish an image of a country strong in nuclear, and jointly maintain the regional and global nuclear safety.

(6) Policy of technical support

Internal technical support organizations are established within the regulatory system to provide all-round technical supports to the MEE (NNSA). Domestic and foreign significant scientific research institutes in nuclear energy industry are selected as the external support organizations to provide long term and stable technical supports to the MEE (NNSA). Experienced experts in all fields of the nuclear energy industry are hired to establish a nuclear safety and environment advisory committee, for the purpose of providing technical advice and expert support for significant issues.

Multi-disciplinary demonstration and discreet decisions are made for significant safety review project, so as to ensure the quality and efficiency of the review, avoid the regulatory errors, encourage technical support organizations to learn from each other, and continuously improve the technical capabilities of the technical support

organization.

3.4.2 Planning

The MEE develops an environmental protection planning every five years, which is synchronized with the national general five-year plan, and implemented after being reported to the State Council for review and approval. The MEE (NNSA) develops medium and long-term plans according to the needs and regularly makes revisions to adapt to the development and changes of China's nuclear energy industry. The five-year plan for nuclear safety and radioactive contamination prevention and control is the special plan in the area of nuclear and radiation safety.

(1) Key tasks of nuclear and radiation safety

- Making continuous improvement to maintain the nuclear power plant safety at high level;
- Strengthening the management and control to reduce the risk of research reactors and nuclear fuel cycle facilities;
- Making comprehensive progresses to speed up the decommissioning of early nuclear facilities and disposal of radioactive wastes;
- Standardizing the management to reduce the radiation accident of nuclear technology application;
- Making comprehensive improvement to guarantee the radiation environmental safety of uranium mining and milling and associated radioactive minerals;
- Strengthening management to improve the quality and reliability of nuclear safety equipment;
- Taking both prevention and control measures to improve the nuclear security level;
- Always be prepared and persistent to improve the nuclear and radiation emergency response;
- Be innovative to promote the scientific technology research and development for nuclear safety;
- Improving capability to promote the modernization of nuclear safety regulation.

(2) Key projects of nuclear and radiation safety

It mainly includes nuclear safety improvement, nuclear facility decommissioning and radioactive waste treatment project, nuclear security and anti-terrorism reinforcement project, accident emergency guarantee project, scientific and

technological research and development innovative project and nuclear safety regulation capacity building, involving important fields of nuclear energy industry and related important organizations.

(3) Guarantee measures

- Improving laws and regulations and strengthening the legal foundation.
- Strengthening supporting policies and promoting key tasks.
- Optimizing institutional mechanisms and improving management efficiency.
- Accelerating talents cultivation and reinforcing talents guarantee.
- Strengthening cultural cultivation and raising safety awareness.
- Intensifying public communication and promoting public participation.
- Deepening international cooperation and learning from advanced experience.
- Improving operating mechanisms and implementing the support policies.

The MEE (NNSA), together with other government departments, actively takes corresponding measures to coordinate the implementation of various tasks, tracks and reviews the progress of key tasks and key projects. All departments and organizations within the regulation system fully consider the key points and requirements of the planning when developing and implementing the regulation work plan, and provide corresponding support and guarantee conditions for the comprehensive realization of the planning goals and tasks. When developing the next five-year plan, the implementation and completion status of the planning is reviewed and verified; in addition, the subsequent works are comprehensively planned.

3.4.3 Regulation System Development and Capability Building

The development of nuclear and radiation safety regulatory systems and regulatory capacity building is the important foundation and strong guarantee for the MEE (NNSA) to effectively fulfill missions of nuclear and radiation safety regulation, implement core values, and ensure regulatory effectiveness and authority. The departments and organizations of the MEE (NNSA) actively reinforce the four foundations, known as institutional team, laws and regulations, technical capability and spiritual culture, and strengthen the eight pillars of review and licensing, inspection and law enforcement, radiation environmental monitoring, emergency response, experience feedback, technical research and development, public communication and international cooperation, so as to construct a firm and powerful nuclear and radiation safety regulation mansion (as shown in Figure 3-1).

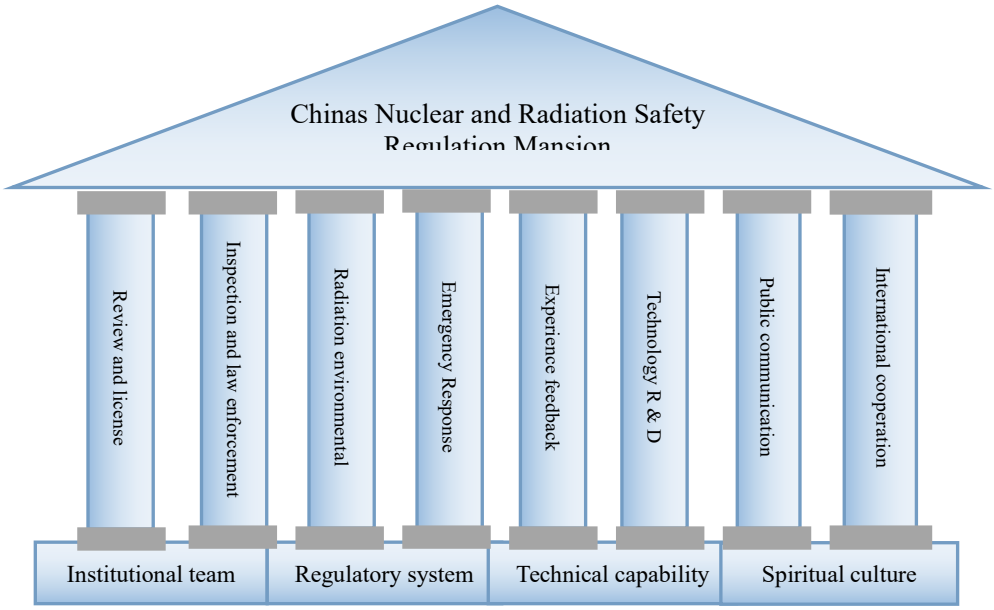


Figure 3-1 Diagram of China's Nuclear and Radiation Safety Regulation

It is required to improve the legislation top-level design in the nuclear area under the lead of *Atomic Energy Law*, *Nuclear Safety Law* and *Law on Prevention and Control of Radioactive Pollution,* and reinforce the foundations of the regulation system; promote the establishment of an integral NNSA affiliated to the MEE; build a regulatory technology research and development base; develop three major capabilities and platforms of independent analysis, test and verification, information sharing, and exchange and training to reinforce the foundations of technical capabilities; implement the nuclear safety concept of being rational, coordinated and balanced; popularize the nuclear safety culture; enhance the big picture awareness, risk awareness, enterprising awareness and discipline awareness; and reinforce the foundations of spiritual culture.

It is required to devote major efforts to promoting the administrative licensing reform and streamline administration and delegate power to the lower level; establish a set of review methods and systems applicable to China's nuclear safety regulation; improve the review capability and strengthen the supports for review and licensing. It is required to strengthen the regulation during and after the activities; strengthen the building of capability in nuclear safety inspection and law enforcement; optimize the methods of regulatory inspection; improve the technical level of regulatory inspection, and strengthen the support for inspection and law enforcement.

It is required to improve the monitoring of national radiation environmental quality, nuclear facility regulatory monitoring and radiation environmental emergency monitoring system; improve the radiation monitoring network layout; optimize the

network layout of national control points and provincial control points, and strengthen radiation monitoring support. It is required to establish a professional team of nuclear accident emergency response with unified command and unified dispatch; establish an expert evaluation system; carry out emergency drills; strengthen local emergency capability building; improve emergency response capabilities and competences of local government, and strengthen emergency support for accidents.

It is required to improve the document system; build information platforms; establish expert library for experience feedback; improve the experience feedback system of the NNSA, and strengthen the support of experience feedback. It is required to promote the construction of national nuclear and radiation safety regulatory technology research and development bases; improve scientific research management systems; foster scientific research teams; ensure continuous investment; improve the application level of relevant outcomes, and strengthen technical research and development support.

Efforts are made to promote the standardization and systematic construction of nuclear safety public communication; develop the information disclosure system for nuclear facilities; increase the extent of public participation; improve the public relations response system for nuclear safety emergency events, and strengthen public communication support. It is required to strengthen international cooperation, further learn from advanced experience, closely follow the development trend of international nuclear safety, learn from foreign advanced nuclear safety management and inspection experience, promote the continuous improvement of China's nuclear safety management, and strengthen international cooperation support.

By 2020, the MEE (NNSA) will develop into a nuclear safety regulation system with complete organizational structure, complete regulatory capabilities, complete codes and standards system, and clear values; and possess a sound nuclear safety review capability, inspection capability, monitoring capability, emergency capability, international cooperation capability, and research and development capability. Efforts are made to get prepared in the aspects of organization structure, system and mechanism, laws and regulations, basic capabilities and human resources for China transforming from a country making great use of nuclear to that powerful in nuclear. It is required to fully implement the rational, coordinated and balanced nuclear safety concept and include the nuclear safety into the track of healthy and sustainable development.

3.5 Organization Structure and Responsibilities

The nuclear and radiation safety regulatory body consists of the headquarters, 6 regional offices and 2 internal technical support organizations (one directly affiliated organization and one multi-identity technical support organization) at the central level. The organization structure is shown in Figure 3-2. The regional offices and the technical support organizations operate independently, accepting the leadership, management and supervision of the headquarters in terms of administration and business.

Local ecological and environmental departments at provincial level and municipality level also perform part of the nuclear and radiation safety regulation functions. They are responsible for the regulation of nuclear safety, radiation safety and radioactive waste within the scope of responsibility of the area under their jurisdiction, participate in the emergency response of nuclear accidents, be responsible for the emergency response of radiation environmental accidents, organize the implementation of radiation environmental monitoring in the areas under its jurisdiction, as well as the monitoring of national controlled and provincial controlled important pollution sources.

The external technical support organizations are selected from major scientific research institutes, enterprises and public institutions in the nuclear energy industry such as the Nuclear Equipment Safety and Reliability Center, Suzhou Nuclear Safety Center, Beijing Nuclear Safety Review Center and China Institute of Atomic Energy. The ecology and environment departments in various provinces and some prefecture level municipalities have also established corresponding technical support organizations on radiation environmental regulation, forming an organizational system of nuclear safety regulation technical support organizations with wide coverage and clear division of levels.

The assignment of responsibilities for personnel in key positions of the headquarters, various departments and organizations of the MEE (NNSA) and the internal and external interface relationships at the central level are detailed in NNSA/HQ-00-ZG-AP-001 *Organization Structure and Assignment of Responsibilities*. The institution setup, duties of key positions and divisions, authorities and interface relationships of each department/organization are described in the internal management procedures.

3.5.1 Main Duties of Personnel in Key Positions

(1) Vice Minister of Ecology and Environment/Administrator of NNSA

The vice minister is responsible for nuclear and radiation safety regulation under the leadership of the leading Party group and the Minister. It is responsible for presiding over the Administrators Working Meeting of the NNSA and the Ministers Special Meeting to review and make important decisions on important items of nuclear and radiation safety regulation.

Major decisions and important items concerning nuclear and radiation safety regulation are determined by the Ministerial Executive Meeting or Ministerial Affairs Meeting of the MEE. The specific items are determined by the Ministers Special Meeting. The general technical decisions are studied and determined by the Administrators Working Meeting of the NNSA. For projects involving policy, planning, codes, standards, systems, budget, science and technology R&D that requires the participation of other departments (administrations) of the ministry, the Administrators Working Meeting may be held together with the Ministers Special Meeting.

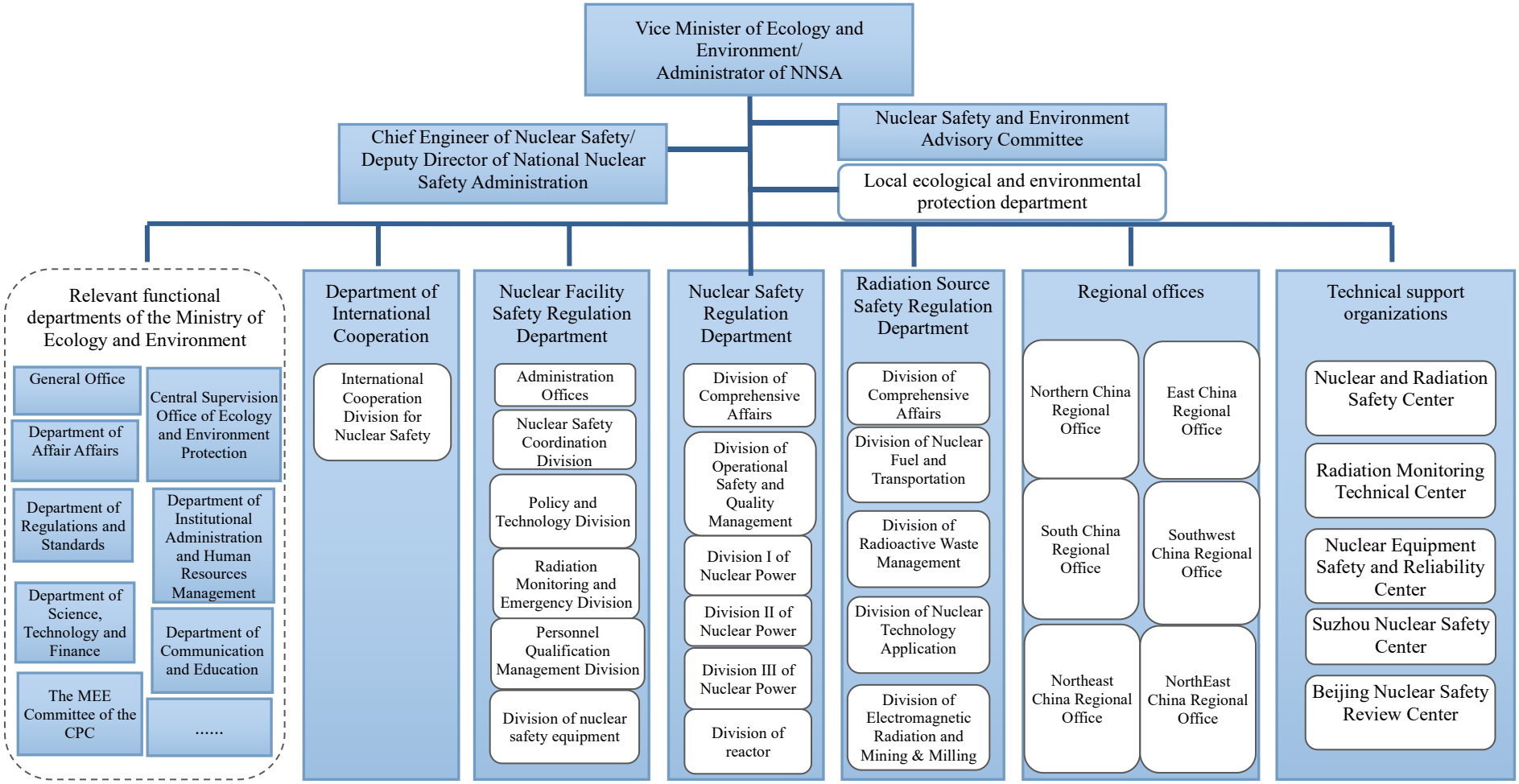


Fig.3-2 Organizational chart of Ministry of Ecology and Environment (National Nuclear Safety Administration)

(2) Chief Engineer of Nuclear Safety of MEE Environment/Deputy Administrator of NNSA

Under the consignment and authorization of the Administrator, the chief engineer is responsible for organizing and coordinating the relevant businesses of the three regulation departments; reviewing and performing technical check for nuclear and radiation safety policies, plans, regulations, standards, systems, and important technical documents.

(3) Deputy Administrator of NNSA/Director General of Nuclear and Radiation Safety Regulation Department

In accordance with the assignment of responsibilities, the deputy administrator is responsible for the internal management of each department, organizing nuclear and radiation safety regulation, and participating in the research and coordination of nuclear and radiation safety regulation based on the requirements of the Director.

(4) Nuclear Safety and Environment Advisory Committee of the MEE

It is required to provide independent advice to the MEE (NNSA) on major issues related to nuclear safety and radiation environmental safety, and provide support for the final decision-making of major issues.

3.5.2 Duties of the Main Professional Departments

(1) Department of Nuclear Facility Safety Regulation

- Drawing up the draft laws and regulations on nuclear and radiation safety, and relevant policies, plans, and standards.
- Undertaking works related to national safety, and taking charge of the coordination mechanism of nuclear safety work and management of environmental and social risk prevention and resolution of nuclear related projects.
- Organizing the radiation environmental monitoring and regulatory oversight of local ecology and environment departments on radiation environmental management.
- Launching emergency preparedness and response to nuclear and radiation accidents, and participating in the prevention and control of nuclear and radiation terrorist events.
- Conducting qualification management and related training of nuclear and radiation safety staff.
- Controlling nuclear materials, licensing and inspection on the activities involved in design, manufacturing, installation and NDT of nuclear safety

equipment.

- Organizing and coordinating examination nuclear and radiation safety businesses.
- Centralizing and communicating the internal development and relevant businesses of the Nuclear and Radiation Safety Center and regional offices.
- Comprehensive coordination o of the three nuclear and radiation safety regulatory departments.

There are 6 internal divisions, namely Administrative Office, Division of Nuclear Safety Coordination (National Safety Coordination Division), Division of Policy and Technology, Division of Radiation Monitoring and Emergency (Nuclear and Radiation Accident Emergency Office), Division of Personnel Qualification Management, Division of Nuclear Safety Equipment.

(2) Department of Nuclear Power Safety Regulation

- Responsible for licensing and inspection of nuclear facilities such as nuclear electricity power plants, nuclear thermal power plants, nuclear heat supply and steam supply devices, research reactors, critical facilities, and sub-critical facilities with power operation with respect to their nuclear safety, radiation safety and environmental protection, and for the independent investigation, technical evaluation and experience feedback of related construction events and operation events.
- Undertaking the domestic implementation of the relevant international conventions.

There are 6 internal divisions, namely the Division of Comprehensive Affairs, Operational Safety and Quality Assurance Division, Division I of Nuclear Power, Division II of Nuclear Power, Division III of Nuclear Power, and Division of Reactor.

(3) Department of Radiation Source Safety Regulation

- Responsible for the licensing and inspection of nuclear fuel cycle facilities, radioactive waste treatment, storage and disposal facilities, nuclear facility decommissioning projects, nuclear technology application projects, and radioactive material transportation with respect to their nuclear safety, radiation safety and environmental protection.
- Responsible for the licensing and inspection of electromagnetic radiation-emitting devices and facilities, uranium (thorium) mines, and radioactive pollution treatment with respect to environmental protection.
- Responsible for the licensing and inspection of mines associated with naturally occurring radioactive materials with respect to environmental

protection.

- Responsible for organizing the investigation and handling of events and accidents related to the transportation of relevant nuclear facilities, radiation sources and radioactive materials.
- Undertaking the domestic implementation of the relevant international conventions.

There are 5 internal divisions, namely the Division of Comprehensive Affairs, Division of Nuclear Fuel and Transportation, Division of Radioactive Waste Management, Division of Nuclear Technology Application, and Division of Electromagnetic Radiation and Mining & Milling.

(4) Department of International Cooperation (International Department)

The Division of the International Cooperation on Nuclear Safety is responsible for international cooperation and exchanges, negotiation of international conventions and foreign affairs of international organizations in the field of nuclear and radiation safety.

3.5.3 Main Duties of Relevant Functional Departments of MEE

(1) General Office

Taking charge of the overall coordination and inspection of the Ministry's administrative functions. Coordinating the daily operating of the Ministry; assist the minister, vice ministers and chief engineer in their official schedules. Formulate the Ministry's regulations and rules and supervising their implementing. Scheduling the Ministry's after-hour on-call shifts and providing secretarial services for the ministerial leadership. Taking charge of work related to the Ministry's official documents and telegrams, files, confidential codes, seals and stamps, classified documents and protection, safety and security, fire protection, as well as e-government, government affairs publicity, information safety and information technology management. Organize and coordinate the general meetings on ecological and environmental protection, review and provide guidance in professional conferences planning that are attended by ministerial leadership, drafting documents for the aforementioned general meetings and other important documents, reports and speeches. Reviewing important documents, announcements and literatures. Organizing and coordinating the general research and investigation programs and other major research programs on certain particular topics. Organizing the compilation of information bulletins, the inspection on the administration of government affairs, the handling of public complaints by letter or by visiting, the

follow-up on motions and proposals. Providing receptions to official activities. Preventing and handling problems with potential social risks in the environmental sector. Providing guidance in the ecological and environmental protection for the sector as a whole.

(2) Central Supervision Office of Ecological and Environmental Protection

Supervising compliance with the principle that CPC committees and government departments of the same level share accountability for ecological and environmental protection, and that leading officials of all levels shoulder the responsibility of ecological and environmental protection in addition to their work duties; Formulate, implement, and supervise regulations regarding ecological and environmental protection, programs and action plans. Organize the inspection of ecological and environmental protection by the Central Government and coordinate inspection teams. As authorized by the Central Government, audit local governments and regional departments implementation of the Central Government's decisions on ecological and environmental protection, identifying failures in compliances. Reviewing and summarizing inspection reports and submitting them for approval, handing over the inspection findings and concerns for them to be addressed, follow up when necessary. Checking and auditing rectifications made after inspections. Administering restrictions upon approval of new projects due to pollution concerns and hold admonitory talks over the pollution issues with local governments. Providing guidance for local governments when they examine ecological and environmental protection. Liaising with regional inspection offices. Carrying out everyday tasks as authorized by the State Council Steering Group for Ecological and Environmental Protection and Supervision.

(3) Department of General Affairs

Taking charge of the overall coordination of the Ministry's ecological and environmental policies, programs and plans. Drafting the ecological and environmental policies, programs and plans, and coordinating and reviewing the programs and plans regarding specific topics. Coordinating the statistics of the ecological environment, the surveys over pollution sources, and the situational analyses of the ecological environment. Coordinating and administering controls over the total amount of pollutant emissions, proposing the names of pollutants and control the targets. Inspecting efforts by local government levels to reduce pollutant emission. Carrying out the target responsibility system, seting forth annual targets, and formulate appraisal plans for ecological and environmental protection. Taking the leading role in the economic restructuring for ecological and environmental protection.

Undertaking the work required for China's Western Development Program, for the rejuvenation of old industrial bases in Northeast China and other areas, promoting the ecological and environmental protection in the Xiong'an New Area, supporting the reform and opening-up of Hainan Province, supporting the coordinated development of the Beijing-Tianjin-Hebei Region. Conducting an annual appraisal of national ecological security and ecological progress. Carrying out the daily operations of the Ministry's advisory role.

(4) Department of Regulations and Standards

Establishing and improving the framework of ecological and environmental laws, regulations and standards. Drafting the general laws, regulations and departmental rules; Coordinating, reviewing and submitting for approval specific laws, administrative regulations and departmental rules within the ecology and environment sector. Contribute opinions regarding the ecological and environmental impact of drafted laws and administrative regulations that are delivered to the Ministry. Reviewing and auditing the legitimacy of the Ministry's regulatory documents, coordinating the removal of laws, regulations, departmental rules and regulatory documents that are no longer relevant. Assessing relevant laws and regulations. Guiding the work administrations work by law, popularizing awareness of the law, and steering local legislations. Providing guidance for reforming the system of ecological and environmental damage compensation. Support the NGOs and relevant government departments in filing public interest litigations in the ecological and environmental sector. Administering the Ministry's legal counseling and the national legislations that correspond to international conventions. Interpret relevant laws, regulations and departmental rules and work with judicial organs to provide judicial interpretations. Organizing the Ministry's administrative review, administrative response to lawsuits, and state compensations. Administering the ecological and environmental national standards, benchmarks and technical specifications, draft relevant programs, plans, administrative measures and standard-setting technical codes. Proposing, coordinating and reviewing national standards and submitting them for approval. Formulating fundamental standards and ecological and environmental benchmarks, assessing the execution of the national standards, accept record-filing of local standards. Coordinating work related to health and the environment, establishing a system for monitoring, investigating and the risk assessment of health and the environment.

(5) Department of Institutional Administration and Human Resources Management

Building the workforce and the human resource, reform the administrative institutions in the sector of ecological and environmental protection. Formulating and implementing the departmental rules on the organizational structure, staffing, personnel management, salary and compensation, professional certification and evaluations for job openings. Selecting, appointing and evaluating the performance of the Ministry's civil servants and the leading officials of the Ministry's regional offices and affiliated institutions. Managing the organizational structure, staffing, salary and compensation, professional certification, evaluations for job openings, performance evaluation, the selection and dispatch of staff working, appointments for studying or training abroad, and the selection of visiting scholars for the Ministry's departments, regional offices, and affiliated institutions. Providing guidance in building the workforce, training officials, certifying professionals and reviewing and approving vocational (practicing) qualifications. Coordinating the national commendations for ecological and environmental protection. Undertaking the dual management of the leading officials in the ecological and environmental protection sector. Undertake the administrative restructuring of the ecological and environmental protection sector. Guiding the institutional restructuring and human resource management in the ecological and environmental protection sector. Assisting ecological and environmental protection performance evaluation of local CPC committees and government leaderships. Organizing and coordinating work for comprehensively deepening reforms, functional transformations and on-site inspections.

(6) Department of Science, Technology and Finance

Taking charge of science and technological advances and the development of fundamental capabilities. Undertaking fixed asset investment and project management in the ecological and environmental sector along with budgeting, finance, capital construction, state-owned asset management, government procurement, internal auditing, and the regulation of subsidies and allowances of the Ministry and its affiliated institutions; Undertaking the regulatory inspection of projects financed by the Central Government special funds that are allocated to the Ministry. Carry out duties related to ecological environment science and technology and coordinate the execution of major ecological and environmental science and technology programs. Administering ecological and environmental science and technology outputs. Fostering public education about ecological and environmental science; Provide guidance to affiliated institutions in their science and technology work. Undertaking the restructuring of the science and technology institutions in the ecological and environmental sector. Formulating and implementing the developmental plans of

ministerial-level key laboratories, engineering research centers, and scientific observation stations. Promoting projects regarding technological management systems and major technical engineering demonstration in the ecological and environmental protection sector. Providing instructions for promoting green procurement, cleaner production, circular economy, ecology and environment-friendly industry development, and compensations for ecological protection.

(7) Bureau of Ecological and Environmental Enforcement

Taking charge of ecological and environmental compliance inspection and enforcement. Supervising the implementation of ecological and environmental policies, plans, laws and regulations, and standards. Drafting emergency preparedness plans for major and catastrophic ecological and environmental accidents and ecological damages. Guiding and coordinating the investigation and handling of such accidents. Solving cross-regional environmental pollution disputes. Organizing national ecological and environmental compliance inspections. Investigating failures of ecological and environmental compliances and take punitive measures accordingly. Supervising the compliance with the requirement that design, construction, and operation of environmental protection facilities must commence at corresponding phases of development projects. Guiding and supervising the final acceptance process of environmental protection facilities accompanying development projects. Preventing and handling social risks of established projects. Providing guidance in building an enforcement workforce for the ecological and environmental sector.

(8) Department of Communication and Education

Organizing, guiding and coordinating national ecological and environmental communications and education; Formulating and implementing programs and plans over communications and education. Organizing communication and educational activities over the development of an ecological civilization and an environment-friendly society; Reviewing and releasing the Ministry’s news briefings. Guiding the collection, analysis and response to public opinions in the ecological and environmental sector. Operating and maintaining new media to announce the Ministry’s governmental affairs. Administering training programs for public awareness of ecology and the environment. Promoting NGOs and the public’s participation in ecological and environmental protection. Preventing and handling environment-related social risks. Providing guidance for newspapers, periodicals and journals affiliated with the Ministry. Providing guidance for the development of communication and educational teams in the ecological and environmental protection sector. Recommending and selecting candidate programs or candidates for ecological

and environmental awards and international environmental awards.

(9) The MEE Committee of the CPC

Carrying out the CPC work along with non-party member related work of the Ministry, its Beijing-based regional offices, and affiliated institutions. Be responsible for the political, ideological, organizational, work style, disciplinary, and institutional improvement of the CPC. Maintaining political security and stability. Assisting the Leading Party Members Group in providing services for democratic discussion meetings and theoretical studies for the Group's core members. Coordinating work related to Party style improvement, clean government buildings, and the establishment of preventive and punitive systems in the ecological and environmental sector in China. Leading Beijing-based regional offices and affiliated institutions in their Party style improvement and clean government building while also providing guidance for such work in China's ecological and environmental sector. Accepting and processing reports, accusations, complaints and appeals against the Ministry's subordinate Party organizations and members for breaches of Party discipline; Investigating cases concerning the breach of Party discipline by organizations and members in the Ministry's internal departments, Beijing-based regional offices, and affiliated institutions; Lead the internal departments, Beijing-based regional offices, and affiliated institutions in working with labor unions, the communist youth leagues, the women's committees, and non-party member organizations and groups; Providing guidance in the ideological and ethical progress of the ecological and environmental protection sector.

3.5.4 Main Duties of Regional Offices

The six nuclear and radiation safety inspection offices, namely North China Regional Office, East China Regional Office, South China Regional Office, Southwest China Regional Office, Northwest China Regional Office, Northeast China Regional Office, are respectively responsible for the nuclear and radiation safety inspection of the north, east, south, southwest, northwest and northeast regions.

The main duties of regional offices as follows:

(1) Responsible for the daily inspection of nuclear and radiation safety and radiation environmental management for nuclear facilities;

(2) Responsible for the daily inspection of radiation safety and radiation environmental management for nuclear technology application project under the direct regulation by the MEE (NNSA);

(3) Responsible for the daily inspection of emergency preparedness for nuclear

and radiation accidents (including nuclear and radiation terrorist attack events) in nuclear facilities operating organizations and nuclear technology application organizations under the direct regulation by the MEE (NNSA), and the inspection of emergency response on accident sites; inspection and evaluation of emergency preparedness, emergency exercise and emergency response of nuclear facilities and other nuclear related organizations under the direction regulation of MEE (NNSA); supervision and evaluation of emergency training and exercise for radiation accidents at provincial level;

(4) Responsible for the inspection of radiation monitoring for nuclear facilities and nuclear technology application projects under the direct regulation by the MEE (NNSA) and the necessary regulatory monitoring, sampling and analysis on site;

(5) Responsible for the supervision of radiation safety and radiation environmental management for local ecological and environmental protection departments;

(6) Responsible for the daily inspection of on-site civil nuclear safety equipment installation and the site inspection for the open package inspection and safety performance test of imported civil nuclear safety equipment for civil nuclear facilities;

(7) Responsible for the inspection of radioactive materials transport activities inside civil nuclear installations;

(8) Responsible for the daily inspection of radiation environmental protection of uranium mining and milling facilities within its jurisdiction;

(9) Responsible for the organization and implementation of the inspection and control point release of the normal refueling and outage of nuclear facilities in the jurisdiction; the technical review and on-site inspection of the continuation of the radiation safety license and part of the additional projects; and the on-site inspection before the decommissioning of the nuclear technology application project;

(10) Responsible for the organization of inspections on the siting and operation for the state-owned radiation environmental automatic monitoring station and the nuclear facility regulatory monitoring system; participation in or organization of the acceptance of above systems under consignment;

(11) Responsible for the nuclear material safety inspection for the nuclear material licensees approved by the MEE (NNSA) in accordance with the local legislation of the civil nuclear materials;

(12) Responsible for the inspection of the quality assurance during the manufacture of nuclear fuel elements;

(13) Responsible for the law enforcement activities, such as investigation and

evidence collection, interview and notification authorized by the MEE (NNSA), for the regulated organizations violating laws and regulations found during the regulatory inspection; proposal of suggestions to the MEE (NNSA) on administrative penalties such as warnings, fines, rectification within due time, order on stopping production, license suspension or withdrawal;

(14) Responsible for the promotion of public communication as to nuclear and radiation safety; urging of local ecology and environment departments and inspection of publicity and science popularization, information disclosure, public opinion monitoring and response and public participation performed by nuclear facilities operating organizations and nuclear technology application organizations; reporting public opinions in time;

(15) Handling of other items assigned by the MEE (NNSA).

In addition to being responsible for nuclear and radiation safety inspection in the region, North China Regional Office also undertake the following responsibilities:

(1) Responsible for the daily inspection of the design, manufacture and NDT activities of civil nuclear safety equipment nationwide;

(2) Responsible for the routine and non-routine nuclear safety inspections of nationwide civil nuclear safety equipment licensees and overseas registration organizations;

(3) Responsible for the inspection of the qualification examination for special technologist of nationwide civil nuclear safety equipment;

(4) Responsible for the inspection of the manufacturing activities of the Class I radioactive materials transport containers nationwide.

(5) Organizing the implementation of the capability verification of the nuclear facility pre-service and in-service inspection technologies of the NDT organization.

(6) Issuance of inspection summary report on the renewal application by the licensee of the certificate for the design, manufacture and NDT of civil nuclear safety equipment.

(7) Organizing inspection activities including daily inspection, non-conformity handling, nuclear safety culture assessment, quantitative evaluation, and quality assurance examination.

3.5.5 Duties of Major Technical Support Organizations

(1) Nuclear and Radiation Safety Center of the MEE (Nuclear and Radiation Safety Center for short)

It is the directly affiliated organization of the MEE (NNSA) and the most

important internal technical support organization that provides all-round technical support and guarantee for MEE. It is also the technical review center, technology research and development center, information exchange center and talent training cradle for nuclear and radiation safety in China. Its services include the technical support for civil nuclear facility safety review and inspection, technical support for radiation environmental safety review and inspection, emergency response and evaluation of nuclear accidents and radiation accidents, research on regulatory policies and regulations, scientific research on nuclear and radiation safety, and related technical advice and information services, etc.

Its main duties include:

- Studies of nuclear and radiation safety policies, planning, laws, regulations, standards, specifications and science and technology; provision of technical advices and services.
- Safety review for licensing document at all stages of siting, construction, commissioning, operation and decommissioning of civil nuclear facilities; review of EIA report at all stages of nuclear facilities.
- Technical review for license and registration application of design, manufacturing, installation and NDT organizations of civil nuclear safety equipment; and safety inspection of imported nuclear safety equipment.
- Regulations on nuclear technology application projects, uranium (thorium) mines, associated radioactive mines, radioactive wastes, transportation of radioactive materials, electromagnetic radiation-emitting devices and electromagnetic radiation environmental regulation as well as nuclear materials control; technical review of physical protection.
- Participation in on-site inspection of nuclear facilities, nuclear safety equipment and nuclear technology application projects.
- Technical support for daily emergency preparedness, emergency response and investigation and handling of nuclear and radiation; works specified in the emergency plan.
- Participation in the prevention and deal with nuclear and radiation terrorist events; radiation environmental monitoring; regulatory monitoring and emergency monitoring of nuclear facility and key radiation sources; capability building of the state-owned radiation environmental quality automatic monitoring station.
- Technical and routine works such as the management of vocational qualification of registered nuclear safety engineers.

- Technical support for qualification management of reactor operators, special technologist of nuclear equipment, etc.; review of technical documents related to above application.
- Communication and training of nuclear and radiation safety.
- Realization of the domestic and international technical exchanges and cooperation; participation in construction and operation of Asian nuclear safety network; technical support for execution of international nuclear and radiation safety conventions.
- Development, operation and maintenance of nuclear and radiation safety regulatory information system.
- Edition, publication and issuance of reports and publications related to nuclear and radiation safety technology.

(2) Radiation Monitoring Technical Center

It is the technical support organization of the MEE (NNSA) in the area of radiation environmental monitoring. It is responsible for providing technical support for the national nuclear and radiation environmental regulation, and organizing the construction of national radiation environmental monitoring network, technical guidance, standard preparation, and major radiation environmental accident emergency monitoring, etc.

Its main duties include:

- Technical support for national radiation environmental monitoring, regulatory monitoring of key nuclear facilities and relevant information release; evaluation of national radiation environmental quality status and changing trends; preparation of national radiation environmental quality report and other special reports.
- Operation and management of the national radiation environmental monitoring network; technical training for the national radiation environmental monitoring; technical guidance, coordination and service for the provincial radiation environmental monitoring departments; and the interface with the national environmental monitoring network.
- Research and technical support for national laws, codes, standards, plans, policies and regulations of radiation environmental monitoring; technical work of standardization of radiation environmental monitoring methods; formulation of technical standards and technical specifications for radiation environmental .
- Quality assurance management for the national radiation environmental

monitoring system; quality inspection, assessment and capability verification, etc.

- Emergency monitoring related technical work for nuclear accidents, extra major radiation environmental accidents and handling of nuclear and radiation terrorist attacks.
- Scientific research, technical services and technical training for radiation environmental protection, analysis and testing techniques and EIA methods.
- Establishment and maintenance of radioactive analysis and testing capabilities for various environmental media; analysis and testing with special requirements.
- Technical review of EIA of electromagnetic construction projects subject to state approval.
- International exchanges and cooperation for radiation environmental monitoring and analysis and testing technologies.
- Other items assigned by the MEE.

In addition to the above duties, the departments and organizations of the MEE (NNSA) are also responsible for the planning, management, implementation, coordination, evaluation and continuous improvement of the management system and various elements. The specific division of work is described in follow sections respectively.

3.5.6 Interface Management

(1) Internal interface

The internal interface of the MEE (NNSA) is under the responsibility of three nuclear and radiation safety regulation departments, the international department and other functional departments. The specific division of interface management is described in the process management. For works related to the regulatory service interface, the division of tasks in interface management and coordination of three regulation departments is as follows:

- Department of Nuclear Facility Safety Regulation is responsible for the centralized management of the preparation and submission for approval of nuclear and radiation safety policies, planning, regulations and standards. Department of Nuclear Power Safety Regulation and Department of Radiation Source Safety Regulation are responsible for proposing policies, planning, regulations and standards in their own areas and submitting them to Department of Nuclear Facility Safety Regulation for summarization,

review and submission for approval.

- Department of Nuclear Facility Safety Regulation is responsible for coordinating the budget for nuclear and radiation safety. Department of Nuclear Power Safety Regulation and Department of Radiation Source Safety Regulation are responsible for proposing the budget of their own departments and submitting it to Department of Nuclear Facility Safety Regulation for coordination before being submitted for approval in accordance with related ministerial procedures.
- Department of Nuclear Facility Safety Regulation is responsible for the emergency work of nuclear and radiation safety accidents, formulating emergency plans for nuclear and radiation accidents, and organizing emergency response actions. Department of Nuclear Power Safety Regulation and Department of Radiation Source Safety Regulation participate in the technical team of nuclear accident and technical team of radiation accident emergency respectively, and carry out emergency response actions according to the division of work specified in the accident emergency plans. The two departments are responsible for the investigation and handling of nuclear and radiation safety events and accidents in their own areas.
- Department of Nuclear Facility Safety Regulation is responsible for centralized contacting with the nuclear and radiation safety center, radiation environmental monitoring technical center and regional offices for internal development and relevant businesses. Department of Nuclear Power Safety Regulation and Department of Radiation Source Safety Regulation provide instructions for the relevant works performed by the Nuclear and Radiation Safety Center, Radiation Monitoring Technical Center and regional offices based on their own responsibilities.
- The three nuclear and radiation safety regulation departments shall undertake the work of complaint letters and visits, administrative review and international cooperation within the scope of their duties according to the responsibilities determined by the three-determination (determination of functions, determination of departments, and determination of staffing) implementation plan of the MEE (NNSA).

(2) External interface

Main external interfaces of the MEE (NNSA) are shown in Figure 3-3. The daily liaison, management and coordination of the external interfaces are under the

respective responsibilities of three nuclear and radiation safety regulation departments, the international department and other functional departments, the nuclear and radiation safety regional offices, and the technical support organizations.

As nuclear safety involves a lot of departments, China has established a nuclear safety work coordination mechanism to comprehensively coordinate relevant departments to promote related work, especially in major items and key areas involving national nuclear safety. The MEE (NNSA) has set up a nuclear safety coordination division (National Safety Coordination Division) to undertake national safety related works such as the nuclear safety work coordination mechanism.

(3) Project Officers

The MEE (NNSA) has established a system of Program Officer to manage and coordinate nuclear and radiation safety review and inspection related activities, which is responsible for the internal/external interface management of review and inspection related activities. Program Officers will be designated as the representative of nuclear and radiation safety regulation in significant regulation areas such as the nuclear power plants, enterprises of important nuclear safety equipment and activities, research reactors, transportation of radioactive materials, nuclear fuel recycling facilities, radioactive waste management, nuclear technology application, electromagnetic radiation, uranium mining and milling and will be authorized to perform centralized management of relevant works related to nuclear and radiation safety regulation. Such officers will organize the preparation of annual nuclear and radiation safety regulatory inspection plans and technical review plans; coordinate the regulatory inspection activities and technical review activities; and track the implementation status.

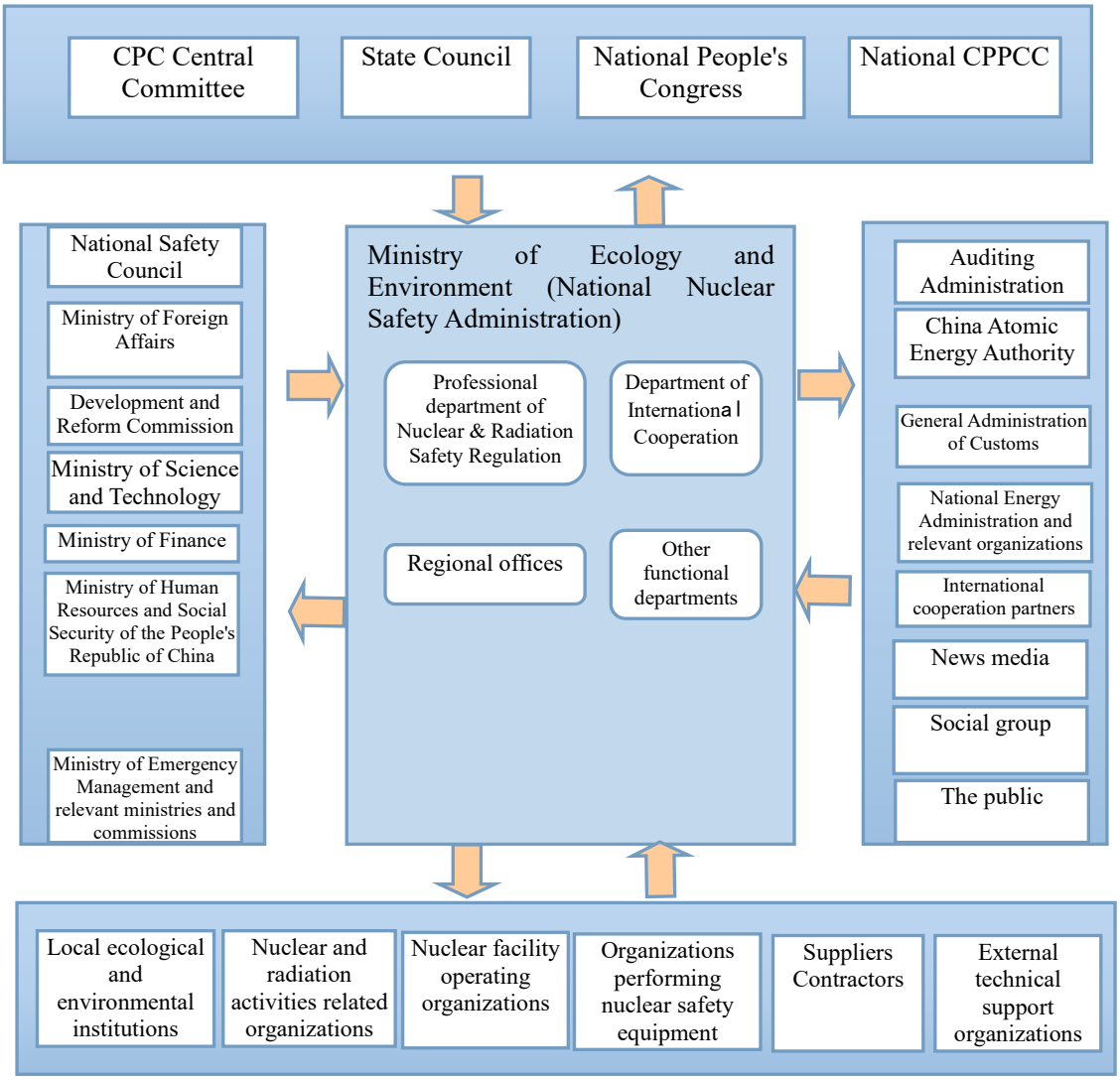


Fig.3-3 Main External Interfaces of the MEE (NNSA)

3.6 Satisfaction of Stakeholders

The stakeholders of the MEE (NNSA) refer to the parties that have a stake in the regulatory activities and results, mainly including licensees, suppliers and contractors, external technical support organizations, the media and the public, social groups, other relevant ministries and commissions, staff within the regulatory system, international organizations with cooperative relations, and regulatory authorities and technical support organizations of other countries.

During the implementation of the management system, the top management of the MEE (NNSA) shall fully identify and consider the expectations and needs of stakeholders in the aspects of planning, implementation and cooperation, and satisfy the stakeholders as well as improve their satisfaction while ensuring that safety is not

impaired. The activities conducted by the MEE (NNSA) to satisfy different stakeholders are shown in Table 3-1.

Table 3-1 The activities conducted by the MEE (NNSA) to satisfy different stakeholders

Stakeholders	Expectations and needs	Activities conducted by the MEE (NNSA)
Licensees	Law-based regulation Clear requirements Transparent process Objective and fair Timely and effective Participation in preparation of regulations and standards	Preparation of nuclear safety laws, regulations, guidance, standards and instructive documents
		Review of EIA documents for nuclear facility/nuclear technology application
		Safety review and conversation related to nuclear facility/nuclear technology application
		Issuance of nuclear facility/nuclear activity licenses, personnel licenses and other approval documents
		Nuclear and radiation safety inspection for nuclear facility/nuclear activities
		Investigation and handling of organizations with major nonconformities/accidents
		Law enforcement against serious violations
		Training, assessment and qualification management for personnel in positions important to safety
		Qualification review and on-site regulatory inspection for organizations performing nuclear safety equipment activities
		Registration of suppliers of imported nuclear safety equipment, and safety inspection and on-site regulatory inspection of imported equipment.
		Radiation environmental monitoring
		Assistance in implementation of nuclear and radiation accident emergency
		Publicity and promotion of the development of nuclear safety culture
		Organizing the implementation of safety and technology joint research and development in significant areas
		Organizing the implementation of internal and external information exchange and experience feedback
		Organizing the implementation of publicity and education, public communication and public participation
		Organizing the implementation of international conventions and international cooperation
		Providing instructions and suggestions as needed
Supplier, contractor and technical organizations	Clear requirements Stable cooperation Mutual achievement	Providing cooperation projects and financial support; clarifying project requirements
		Evaluation and review of qualifications and performance of suppliers
		Inspection, supervision and coordination of the project implementation process
		Evaluation and acceptance of project results
		Management and control of non-conformities
		Providing guidance and advice when necessary
Media and the public	Right to know Right to participate	Issuance of information related to the nuclear and radiation safety regulation activities and results
		Publicity and education of nuclear and radiation safety
		Public opinion monitoring, response and expert interpretation

Stakeholders	Expectations and needs	Activities conducted by the MEE (NNSA)
	Right to supervise	Consultation of public opinions on major regulatory decisions
		Release of environmental radiation monitoring data
		Release of nuclear and radiation accident emergency information
		Tracking and analysis of major nuclear accidents at home and abroad
Social group	Communication bridge Understanding and support Right to participate Right to supervise	Actively supporting and participating in activities of social groups such as industry associations and societies
		Cooperative research on hot and difficult issues
		Actively listening to opinions and suggestions and responding to concerns in a timely manner
		Entrusting the implementation of personnel training, academic and experience exchange, research in the frontier areas, and evaluation in the field of nuclear and radiation safety.
Employees	Right to know Right to participate Right to supervise Understanding and support Recognition and respect Sense of accomplishment	Pre-job training, retraining and on-the-job training
		Providing good working conditions and atmosphere
		Establishment of mutual communication, trust and cooperation relationship
		Providing fair learning and career development opportunities
		Providing guidance, support and advice when necessary
Other government departments related	Understanding and support Mutual respect Collaboration	Project cooperation
		Establishment of a relationship of trust and collaboration
		Regular communication and exchange
		Information, experience and product sharing
Relevant international authorities and regulatory authorities of other countries	Accountability Integrity and transparency Active participation Cooperation and sharing	Fulfilling obligations under international conventions
		Information, knowledge and experience sharing
		Signing a nuclear safety cooperation agreement, conducting personnel exchanges, information exchange, technical cooperation and joint research and development under the agreement
		Participating in the development and revision of international safety standards
		Organizing, hosting or participating in various international meetings, training courses and seminars

The MEE (NNSA) takes the stakeholder satisfaction as one of the methods to measure the performance of the management system, so as to measure the

effectiveness of the established management system and identify areas for improvement. Each professional department, regional office and technical support organization is responsible for collecting and processing the information as to the stakeholder satisfaction/dissatisfaction within the scope of their regulatory duties. It includes:

- The identification of various sources of information and continuous collection of relevant information for documentation, such as questionnaires, direct communication with stakeholders, reports from various media, public opinion monitoring and public inquiry, industry research reports, etc.
- Regular analysis of the collected information to identify gaps as a basis for improvement and as an important input to management reviews.

IV. Support and Guarantee

4.1 Planning and provision of resources

In order to fulfill its nuclear and radiation safety regulatory mission and responsibilities and ensure the effective and efficient operation of the management system, the MEE (NNSA) needs adequate resource guarantee, including infrastructure and working environment, human resources, information and knowledge, international cooperation, financial resources, technology research and development projects, suppliers and technical support organizations. The relevant departments and organizations of the MEE (NNSA) shall analyze and propose the resources required to carry out their duties and activities. Thesenior management of the MEE (NNSA) shall develop policies and take measures to ensure that the required resources are provided in a timely manner to meet the demands of the work.

At the headquarters of the MEE (NNSA), the professional department is responsible for the planning of all kinds of resources required. The counterparts of the MEE (NNSA) are responsible for reviewing various resource demand plans and providing corresponding resource to meet the requirements. The regional offices and the directly affiliated organizations are responsible for planning and managing the various resources required to complete their duties, and completing the resource allocation and provision with the support and assistance of the counterparts of the MEE (NNSA). Regional offices and directly affiliated organizations have relative independence in human resource management, management of scientific and technological research and development project, information and knowledge management, and financial management, while shall meet relevant policies, management systems and procedure requirements of the MEE (NNSA), and accept the guidance and supervision of the counterparts of the MEE (NNSA).

4.2 Infrastructure and Working Environment

The infrastructure and working environment are the material basis for the MEE (NNSA) to perform its regulatory duties. The Department of Science & Technology and Finance (DSTF) of the MEE (NNSA) is the centralized management department of this element, and is responsible for preparation of planning, basic capability building, state assets management, comprehensive coordination of government affairs, and regulatory inspection. The professional department of the MEE (NNSA) analyzes and proposes the needs for infrastructure and working environment according to the

work needs, and reports to the DSTF for approval. The regional offices and technical support organizations are responsible for the planning, coordination and management of their infrastructure, equipment and work environment under the leadership, support and supervision of the DSTF.

The departments and organizations of the MEE (NNSA) shall take the following measures to implement effective management and control over the infrastructure and working environment:

(1) Identifying the infrastructure required to perform its duties, with necessary regulatory technical tools and methods, mainly including:

- Basic office space and equipment;
- Internal and external office network of the organization;
- Nuclear and radiation accident emergency facilities and equipment;
- Radiation environmental monitoring laboratory and related instruments and equipment;
- Analysis, calculation and verification software for nuclear and radiation safety review;
- Simulator and test equipment for safety analysis, verification and personnel training;
- Instrument and equipment required for nuclear and radiation safety regulation;
- Facilities and equipment required for personnel training and assessment.

(2) Developing and effectively implementing management systems and procedures, and conducting standardized management of laboratories, facilities, equipment, instruments and meters.

(3) Establishing a quality assurance system for radiation environmental monitoring laboratories; reception of national laboratory accreditation and regular regulatory inspection to ensure the correctness of monitoring results.

(4) Establishing a suitable office environment; creating a working atmosphere of open communication and teamwork; providing stable wage income and health care for the staff as well as necessary support for the staff.

(5) Developing and effectively implementing the management system and procedures for nuclear and radiation safety research and development base construction; strictly abiding by the relevant national laws and regulations, and fully utilizing and integrating industry-related resources, technologies and experience.

In order to comprehensively improve nuclear and radiation safety regulation capabilities, the top management of the MEE (NNSA) has been actively promoting

the construction of a national nuclear and radiation safety technology research base. The research base will be equipped with 6 scientific research verification laboratories and 4 sets of common supporting facilities, 10 key projects in total and involving the regulations on nuclear facilities, nuclear safety equipment, nuclear technology application projects, uranium (thorium) mines, associated radioactive mines, radioactive wastes, transportation of radioactive materials, electromagnetic radiation-emitting devices and electromagnetic radiation environmental regulation as well as nuclear materials control and physical protection; and covering all links of siting, design, construction, commissioning, operation and decommissioning.

All departments and organizations of the MEE (NNSA) shall take the opportunity of building a national nuclear and radiation safety regulatory technology research and development base to build the technical support platform for nuclear and radiation safety regulation, and comprehensively strengthen nuclear and radiation safety review, inspection and monitoring, education, international cooperation and other capabilities, and constantly improve the nuclear and radiation safety regulation level of China.

For details on the management requirements for infrastructure and work environment, refer to NNSA/HQ-00-ZG-AP-007 *Working Instructions for Integrated Management of Infrastructure and Working Environment*.

4.3 Development of Human Resources

4.3.1 Personnel Recruitment and Official Appointment

The headquarters, regional office and directly affiliated organization of the MEE (NNSA) shall develop their own human resources allocation and recruitment plans according to their work needs, business development needs and existing staffing status, and report to the Department of Administrative System and Human Resources (DASHR) of the MEE (NNSA) for review and approval. The DASHR is responsible for the selection, appointment, supervision and management of the civil servants of headquarters and official of regional offices and the directly affiliated department (bureau). Other personnel shall be selected by the regional offices and the directly affiliated organizations under the guidance and supervision of the DASHR.

The departments and organizations of the MEE (NNSA) shall take the following measures to implement effective management and control over the personnel recruitment and official appointment:

(1) Identifying human resource demands; developing human resource planning

and annual personnel recruitment plans, and organizing the implementation.

(2) Based on the policies of selection and appointment of official and the human resources, selecting and hiring leading official and personnel of key positions through public selection, competition, and referrals.

(3) Conducting regular assessment and evaluation of the performance of personnel at all levels; identifying and encouraging employees to do a good job, and providing fair and reasonable incentives and career development opportunities.

4.3.2 Personnel Training and Qualification

The headquarters of the MEE (NNSA) is responsible for organizing the preparation of training programs and training materials for all types of personnel in the regulation system. All departments and organizations shall develop and implement their own personnel training and assessment plans according to their human resource status, work needs and business development needs. Relevant requirements for qualification and authorization shall be developed and implemented for personnel of key regulatory positions.

The departments and organizations of the MEE (NNSA) shall take the following measures to implement effective management and control over the personnel training, assessment and qualification management:

(1) Identifying the needs of personnel training in each business area; developing and implementing the personnel training program of the regulation system, and proposing clear requirements for the training objectives, training contents, training methods, assessment standards, and qualification requirements of various personnel. The training equivalent principle can be applied to those who have certain working experience of certain years in nuclear energy and related industries.

(2) Developing and effectively implementing the management system for personnel training, procedures and annual personnel training plan; selecting and fostering qualified instructors; supervising and managing the training process, and evaluating the training effect. Regular retraining shall be organized to maintain and update knowledge and experience.

(3) Classified management shall be performed for personnel of key regulatory positions; and the training content and methods shall be determined for different positions, mainly including:

- Program Officer of nuclear and radiation safety regulation;
- Personnel developing nuclear and radiation safety regulations and standards;
- Nuclear and radiation safety review personnel;

- Nuclear and radiation safety inspection personnel;
- Environmental assessment personnel for nuclear and radiation safety construction projects;
- Nuclear and radiation accident emergency response personnel;
- Radiation environmental monitoring personnel;
- Nuclear safety equipment inspection personnel;
- Experience feedback personnel for nuclear and radiation safety;
- Inspection personnel of the management system, etc.

(4) Qualification assessment and authorization are required for nuclear and radiation safety inspectors, safety reviewers and personnel developing regulatory standards; regular evaluation shall be performed for their performance. If possible, the safety reviewers and safety inspectors shall be classified according to the professional area, and targeted knowledge and skills training shall be carried out.

(5) Providing multi-channel and multi-level training opportunities, including:

- Pre-job training for fresh employees;
- Systematic training on nuclear and radiation safety knowledge;
- Position knowledge and skills training;
- Regular retraining for management official and technical official;
- Internal and external personnel exchange and exercise (temporary post);
- Internal and external professional qualification training and retraining;
- Various internal and external technical exchanges and seminars.

For details on human resources management requirements, please refer to NNSA/HQ-00-ZG-AP-008 *Instructions for Human Resource Management* and supporting working rules *Instructions for Training of Nuclear and Radiation Safety Regulation of NNSA* and *Methods for Organization and Management of the Trainings for Nuclear and Radiation Safety Inspectors.*

4.4 IT application and Knowledge Management

Information and knowledge are important resources for nuclear and radiation safety regulation. They are of great significance to personnel training, experience feedback, regulatory decision-making, knowledge and experience inheritance, regulatory technology and capability improvement, and continuous improvement of management systems.

Under the unified leadership of the Office of the Leading Group for Cyberspace Affairs (hereinafter referred to as OLGCA), the departments and organizations of the MEE (NNSA) will implement the arrangement of OLGCA and implement the

requirements for dual management of informatization. The following measures shall be taken to effectively manage all kinds of information and knowledge collected and generated during the work process:

(1) Identifying the information and knowledge categories and access channels to be collected, and designating special personnel for the monitoring, collection, sorting and maintenance of information. The management systems and procedures shall be developed for sensitive information related to national safety and intellectual property rights; effective management measures and technical methods shall be taken to ensure the appropriate safety and confidentiality of information and knowledge.

(2) According to the plan on informatization regulation and requirements for standards and regulations developed by the OLGCA, the top-level design shall be provided for the informatization construction of the nuclear and radiation safety regulation system; the overall planning and development shall be performed for professional database, knowledge management platform, cyberspace platform and publicity platform.

(3) The systematic, standardized and delicacy management shall be performed for various types of knowledge and information to integrate and improve the work platform and data platform, optimize the workflow, and achieve efficient data transmission, sharing, analysis and display. It is required to integrate various information and data resources to promote the timely, adequate and effective sharing and application of knowledge and information.

(4) The main application methods of information technology include:

- Development and application of office automation systems;
- Information disclosure and publicity website;
- Video conference system and data transmission platform;
- Design, development and application of professional databases and management systems;
- Design and application of online learning platforms.

For details on information and knowledge management requirements, please refer to NNSA/HQ-00-ZG-AP-009 *Instructions for Knowledge Management and Informatization Construction*.

4.5 International Cooperation

International cooperation is able to provide the MEE (NNSA) with important external supports. The International Department is the centralized management department of international cooperation, including an International Cooperation

Division for Nuclear Safety, which is responsible for international cooperation and exchanges, negotiation of international conventions and foreign affairs of international organizations in the area of nuclear and radiation safety. All departments and organizations are responsible for proposing their own needs and plans for international cooperation, and submit them to the International Department for review and approval. During the implementation of plans, it is required to strictly abide by the provisions of the state and the MEE (NNSA) and accept the guidance, management and supervision of the International Department.

The departments and organizations of the MEE (NNSA) shall take the following measures to implement effective management and control over the international cooperation in the area of nuclear and radiation safety:

(1) Developing and effectively implementing the international cooperation related management systems, procedures and annual work plans, and checking and tracking the implementation status.

(2) Expanding mechanisms and channels for mutual exchange visits to and from international agencies, conducting international information research and publicity on nuclear and radiation safety, and establishing good cooperative relations with relevant organizations such as the Ministry of Foreign Affairs, the Ministry of Science and Technology, and the China Atomic Energy Authority.

(3) Channels for international cooperation mainly include:

- Activities related to the implementation of *Nuclear Safety Convention* and *Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management;*
- Cooperation with international agencies such as the IAEA and OECD NEA;
- Bilateral cooperation with the regulatory bodies of the United States, France, Russia, Pakistan, Japan, South Korea and their technical support organizations;
- Regional cooperation with the EU, Japan and Korea.

(4) The main ways of international cooperation include:

- High-level meetings and communication;
- Negotiation, signing and implementation of international conventions;
- Preparation and revision of international safety standards and technical documents;
- Organizing or participating in the international meetings;
- Personnel training and exchange visits;
- Regular or irregular information exchange;

- Special technical seminars and exchange of experiences;
- Technical cooperation and research and regulatory support.

For details on the management requirements for international cooperation, please refer to NNSA/HQ-00-ZG-AP-010 *Instructions for International Exchange and Cooperation and Foreign Affairs Management*.

4.6 Financial Resource Management

The nuclear and radiation safety regulation departments of the MEE (NNSA) shall put forward the fund requirement for the implementation of the work according to the needs of the work, which will be submitted to the DSTF for review and approval after being summarized and coordinated by Department of Nuclear Facility Safety Regulation. The regional offices and the directly affiliated organizations are responsible for planning, coordinating and managing their financial resources, strictly complying with the relevant regulations of the state and MEE (NNSA), and accepting instruction, management, supervision and audit from the DSTF, Ministry of Finance and Auditing Administration.

The departments and organizations of the MEE (NNSA) shall take the following measures to implement effective management and control over the financial resources:

(1) Developing and effectively implementing the relevant management systems and procedures for financial resources, reasonably preparing annual budget plans, strictly enforcing budgets, conducting regular inspections, supervisions and auditing of their implementation, and seriously investigating and dealing with financial violations.

(2) Obtaining income by law and trying the best to save expenditures, strengthening economic accounting, implementing performance evaluation, and improving the efficiency of fund application.

(3) Strengthening asset management, rationally allocating and effectively using assets to prevent asset loss. Financial control and supervision shall be performed for economy activities to prevent financial risks.

For details on the management requirements for financial resources, please refer to NNSA/HQ-00-ZG-AP-011 *Instructions for Financial Resource Management*.

4.7 Technology Research and Development Project Management

The MEE (NNSA) allocates a certain amount of scientific research funding each year to support technology research and development projects for nuclear and radiation safety regulation. All departments and organizations shall take both short-term needs and long-term strategies into consideration, propose a project plan for scientific and technological research and development, which will be included into the scientific research project library by Department of Nuclear Facility Safety Regulation and submitted to the DSTF for review. During the implementation of projects, it is required to strictly abide by the requirements of the state and the MEE (NNSA) and accept the guidance, management and supervision of the DSTF.

The MEE (NNSA) has set up a Nuclear Safety Research Institute at the Nuclear and Radiation Safety Center, which is responsible for the preparation and implementation of important scientific research projects for nuclear and radiation safety regulation. Other core professional departments will take charge of subject studies in the area of respective responsibility and develop safety standards, technical guidelines, review methods and tools required for review and inspection in addition to daily safety reviews and inspection tasks.

The departments and organizations of the MEE (NNSA) shall take the following measures to implement effective management and control over the technology research and development projects:

(1) Identifying the needs of key research projects in the area of nuclear and radiation safety, initiating multi-channel reporting of research and development projects, conducting investigation and research in various professional areas, and seeking partners to conduct joint research when necessary.

(2) Developing and effectively implementing the management system, procedures and annual scientific research project plans for scientific and technological research and development projects, conducting regular inspection of the research and development process, and perform evaluation, acceptance and promotion of the project results.

(3) The main access channels of technology research and development projects include:

- National scientific and technological major special projects;
- Project of National Natural Science Foundation;
- Major special projects of instrument;
- Technology cooperation projects of IAEA

- International cooperation projects of EU;
- Cooperative research and development with nuclear energy related enterprises;
- Cooperative research and development with other national regulatory authorities and international agencies.

(4) Key research directions in the area of nuclear and radiation safety include:

- Reactor safety;
- Prevention and mitigation of severe accidents;
- Nuclear power plant site safety;
- Measures preventing and mitigating the impact of flying objects in nuclear power plants;
- Quality and reliability of nuclear safety equipment;
- Safety of nuclear fuel cycle facilities;
- Safety of nuclear technology application;
- Transportation of radioactive material and physical protection;
- Nuclear emergency and anti-terrorism;
- Radiation EIA review and radiation exposure control;
- Radioactive waste processing and nuclear facility decommissioning safety, etc.

In addition, independent safety analysis, evaluation, verification and computing capabilities are the core of regulatory technology research and development and capability building, including the configuration and construction of software and hardware facilities, the cultivation of technical talents, and the overall management and application of related computing software. In consideration of the wide coverage of this work and the high requirements for personnel capabilities, the MEE (NNSA) has established an inter-departmental joint research and development team for the overall planning, arrangement and implementation of related works. It is required to regularly check the progress and achievements of various activities, comprehensively promote the capability building of independent verification and computing so as to improve the independent verification and computing capability, strengthen the technical depth of safety review, and enhance the independence, authority and effectiveness of the review.

For the details on the management requirements for the technology research and development project, please refer to NNSA/HQ-00-ZG-AP-012 *Working Instructions for Scientific Research Management of Nuclear and Radiation Safety*.

4.8 Suppliers and External Technical Support Organization

All departments and organizations of the MEE (NNSA) shall take both short-term needs and long-term strategy into consideration, select appropriate suppliers and external technical support organizations, and effectively manage them so as to provide adequate, appropriate, stable and effective regulatory support for nuclear and radiation safety regulation.

The departments and organizations of the MEE (NNSA) shall take the following measures to implement effective management of the suppliers and external technical support organizations:

(1) Reasonably selecting suppliers and external technical support organizations based on work demands and competency and qualification requirements. Regular inspection and evaluation shall be performed for their actual performance to continually optimize the quantity and quality of qualified suppliers and external technical support organizations.

(2) Conducting regular or irregular communication at appropriate levels of mutual organizations to enhance mutual understanding, establish long-term and stable cooperative relationship, avoid disputes, and promote the prompt resolution of problems.

(3) Inviting the suppliers and external technical support organizations in the important experience exchange activities of the MEE (NNSA), sharing knowledge and experience, and actively helping them improve the quality of work and achieve continuous improvement.

For the details on the management requirements for suppliers and external technical support organizations, please refer to NNSA/HQ-00-ZG-AP-005 *Guideline for Procurement Control and Contract Management*.

V. Process Implementation

5.1 General Requirements for Process Management

Each work is a process that can be planned, implemented, managed, evaluated, and continuously improved. The departments and organizations of the MEE (NNSA) adopt the process method to analyze the task that they are responsible for, determine the input, output, resources required and activities to be carried out for each process, and perform effective management and control over each link. In addition, they identify the connections and interactions between different processes, and divide the activities of the management system into a set of interrelated process networks for planning and management to achieve the expected results more effectively and efficiently. The management and control flow of specific process is shown in Figure 5-1.

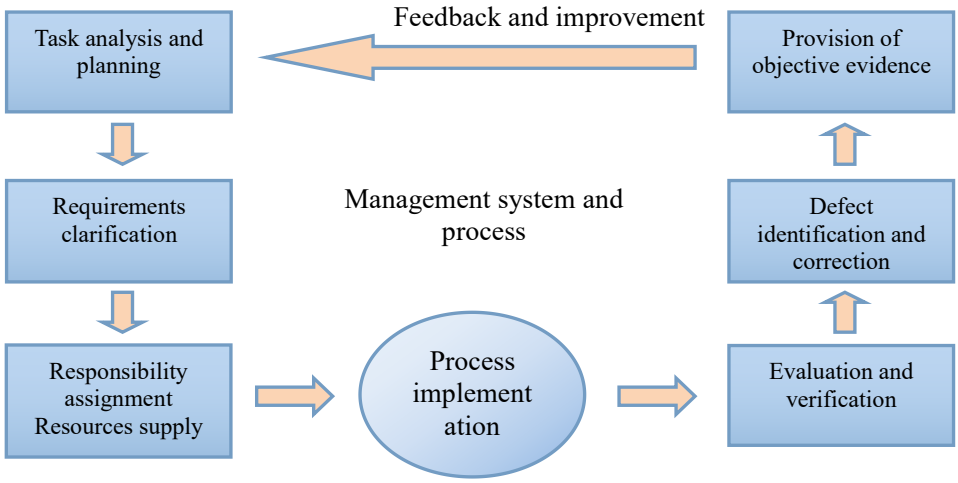


Fig.5-1 Management and Control Flow of Specific Process

The MEE (NNSA) analyzes the activities required to complete its regulatory mission and responsibilities, and divides them into a common management process and a core work process. The former mainly involves general activities of system management and operation; the latter mainly involves important regulatory activities and important aspects that affect the effective implementation of regulatory activities. It not only considers the requirements of relevant IAEA standards and technical documents, but also takes account of the specific reality and recent major problems contradictions requiring resolution of China's nuclear and radiation safety regulation.

The departments and organizations of the MEE (NNSA) shall develop and effectively implement the management programs or procedures for the above-mentioned processes according to their own functions and tasks, which shall be

defined as follows:

- Applicable management requirements, such as applicable legal and regulatory requirements;
- Responsibilities, authorities, and interface relationships;
- Specific work content, methods and processes;
- Documents or records to be prepared.

The departments and organizations of the MEE (NNSA) shall develop work plans for each process, determine the work scope, requirements, resources required, and priorities according to the requirements of the management program and procedures. It is required to record the results of the activities in detail, supervise the implementation of the activities, ensure effective coordination between related activities, and make the required documentation. It is also required to evaluate and verify the results of the activities, identify and correct existing problems in a timely manner, and conduct effective experience feedback to promote continuous improvement of work.

5.2 General Management Processes

5.2.1 Document Management

(1) Management duties and requirements

The MEE (NNSA) stipulates and controls the preparation, review, approval, release, distribution, and modification of documents required for the management system related activities, so as to ensure that the documents used in the work are complete, correct, and applicable. Department of Nuclear Facility Safety Regulation is responsible for the overall planning, coordination, making preparation and submission for approval of the documents required by the headquarters for implementing its duties. Each professional department is responsible for proposing requirements for the documents required by its own department, and arranging qualified personnel for preparation and review. The designated divisions of the regional offices and technical support organizations are responsible for the centralized management of documents of their own organizations.

(2) Main works

The departments and organizations of the MEE (NNSA) shall take the following measures to implement effective control over the document management process:

- Identifying all kinds of documents required to perform regulatory duties, making overall planning for such documents, and clearly defining the

requirements for preparing, including that for cover, LOGO design, format, content, and coding.

- Selecting qualified personnel to complete the preparation and review of documents, avoiding conflicts between documents, ensuring that documents are correct, applicable, coordinated, self-consistent, and easy to understand and implement. Performing effective management control over the preparation, review, approval, release, use and revision of documents.
- Regularly publishing a list of the latest valid document directory to ensure that the relevant personnel are able to obtain the required documents in a timely manner. Systematically reviewing and evaluating the management system documents, and if necessary, revising or upgrading in time to maintain the correctness and suitability of the documents. Strictly controlling the translation quality of documents to completely and correctly reflect the meaning of the original text.
- Internal documents requiring management control mainly include:
  a) Administrative management procedure and business management procedure;
  b) Technical management program, manual, plan and its implementation procedures and working instructions;
  c) Nuclear and radiation safety license or approval documents;
  d) Work planning or plans;
  e) Contracts or agreements;
  f) Literatures or publications;
  g) Documents to be disclosed to the media or the public;
  h) Various important reports on nuclear and radiation safety regulation, such as national reports for convention execution, safety review reports, safety inspection reports, and annual reports of the MEE (NNSA).
- Performing effective management of external documents as a basis for work or important input, so as to ensure timely collection, coding, delivery, response and use of such documents. External documents requiring management mainly include:
  a) International conventions and related rules, convention execution review procedures and returns;
  b) Applicable international safety standards, guidelines, instructions, technical standards and other technical documents;
  c) Applicable Chinese national laws, regulations, technical standards and

specifications;

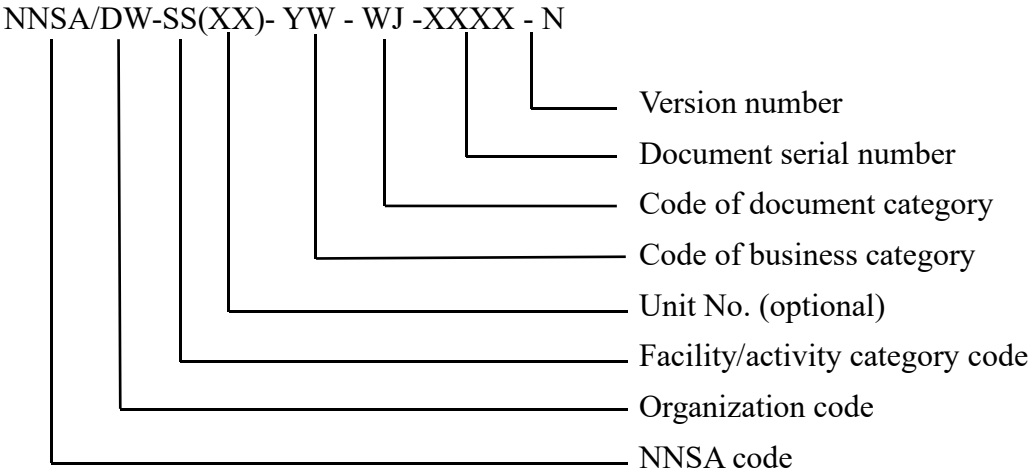
d) Documents to be implemented issued by the higher-level organization or other ministries and commissions of the same level;

e) Various types of documents submitted by the regulated party as important inputs for regulatory work;

f) Documents provided by the contractors or domestic and foreign partners as important inputs for regulatory work.

(3) Classification and coding rules of documents

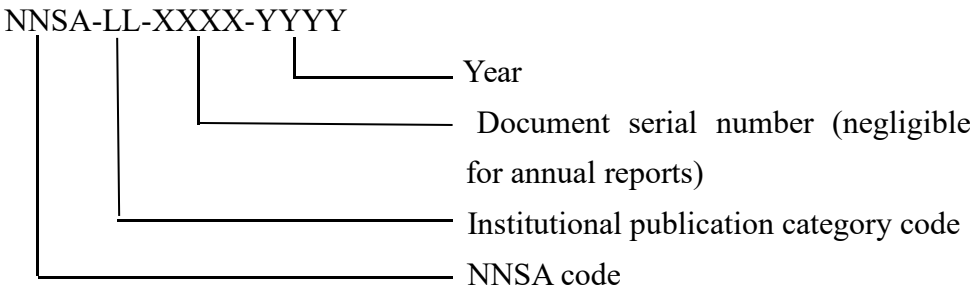
The classification and coding of China's nuclear and radiation safety management system documents shall be carried out according to the rules shown in Table 5-1. Such rules apply not only to the various management system documents generated and used within the regulation system, but also to related records, for the purpose of internal management of regulations and records, so that the working personnel can track and verify the relevant work, and ensure the integrity and traceability of the document records. The specific coding method is described as follows:



For example, the code for *Inspection Program for Nuclear Power Plant Construction Stage* is NNSA/HQ-01-JD-PP-001. For safety review and inspection related activities, the code of a specific nuclear facility can be added after the facility/activity category. For nuclear power plants, the unit number CNXX can be added. The order of the nuclear power unit code is determined according to the time of the construction license and is consistent with the number of the China unified nuclear power unit reported to the IAEA. For example, a regulatory inspection report of the Qinshan Nuclear Power Plant issued by the East China Regional Office can be coded as NNSA/ECRO-01(CN01)-JD-RT-003-2015.

The coding rules for regulatory documents such as nuclear safety regulations and

guidelines issued by the MEE (NNSA) are detailed in 5.3.1(4); the rules for the issuance of various administrative approval documents are detailed in 5.2.1 (6). The institutional publications issued by the NNSA system are coded according to the coding rules shown in Table 5-2. The specific coding methods are as follows:



For example: NNSA-ZH-0012-2015 represents the No. 12 NNSA comprehensive report in 2015; NNSA-NB-2015 represents the NNSA annual report in 2015; and NNSA-YW-0001-2016 represents the translation version of the NNSA regulations in 2016. NNSA-YW-1001-2016 represents the translation version of No.1 NNSA professional &technical document in 2016.

(4) Document preparation requirements

The supervisor of the documentation division shall select qualified personnel to ensure that the documents are accurate and applicable, the content and format meet the specified requirements and the code is unique, and the status and version information of the documents are indicated. The preparation of administrative management procedures and business management procedures shall at least include the following contents:

- Purpose and applicability;
- Reference documents and normative reference**;**
- Division of duties;
- Main work and requirements;
- Main working process;
- Evaluation and verification of work quality;
- Corresponding documents or records to be developed, etc.

The preparation requirements for technical management programs and their implementation procedures, work instructions and other documents are similar to that for the above mentioned management procedures. If necessary, the prerequisite requirements, focus, activity verification methods and acceptance criteria, tracking and handling of non-conformities and violations, response and handling of emergency situations, etc. shall be supplemented. The preparation of documents of other

categories will be defined depending on specific requirements.

Table 5-1 Coding rules for documents and records of China Nuclear and Radiation Safety Management System

Organization formulating documents	**Organization code**	**Facility/activity**	**Facility/ activety code**	**Business category**	**Business code**	**Document category**	**Document category code**
Headquarters [1]	HQ	General-purpose	00	Comprehensive management	ZG	Program/manual/ plan, etc.	PP
North China Regional Office	NCRO	Nuclear power plant	01	Preparation of codes and standards	FG	Administrative management procedures	AP
East China Regional Office	ECRO	Research reactor	02	Safety review license	SP	Business management procedure	MP
South China Regional Office	SCRO	Nuclear fuel cycle facilities	03	Safety related inspection and law enforcement	JD	Implementation procedures / working instructions	IP
Northwest China Regional Office	NWRO	Radioactive waste management	04	Nuclear and radiation accident emergency	YJ	License/approval documents	LA
Southwest China Regional Office	SWRO	Regulation of nuclear material	05	Radiation environmental monitoring	JC	Contract/agreement	CT
NorthEast China Regional Office	NERO	Nuclear safety equipment	06	Information disclosure and public participation	XG	Planning/plan	PL

Nuclear and Radiation Safety Center	NSC	Transportation of radioactive material	07	EIA review	HP	Report	RT
Radiation Monitoring Center	RMTC	Nuclear technology application	08	Personnel training and qualification management	PZ	Meeting information	MM
Other related authorities	EA	Uranium mining and milling	09	International cooperation	GH	Regulatory documents in the category of nuclear safety related regulations and guidelines	Separate coding
The regulated party	LH	Electromagnetic radiation	10	Science and technology research and development	KY	NNSA publications	Separate coding
Supplier/partner	SP	Others	XX	Base construction	JJ	Others[2]	XX
Others	XX			Others	XX		

Note [1]: documents issued by the Department of Nuclear Facility Safety Regulation, the Department of Nuclear Power Safety Regulation, and the Department of Radiation Source Safety Regulation may use HQ1, HQ2, and HQ3.
Note [2]: other documents and records to be archived as required by the MEE, such as the Bill of National People's Congress, the CPPCC Bill, and the commendation materials.

Table 5-2 Coding rules of NNSA publications

Category of institutional publications	Code	Description
Comprehensive reports of NNSA	ZH	It is an elaborate report on inter-system content in the area of nuclear safety, including comprehensive reports such as nuclear safety meeting proceedings, academic essays, collection of review literatures, annual documentations of a department of the NNSA, nuclear safety system research report and comprehensive report such as management report of NNSA.
Assessment reports of NNSA	PJ	It includes the nuclear safety evaluation report, safety analysis report and EIA review report for a specific facility.
Special reports of NNSA	ZT	It is the report on the professional content in the area of nuclear safety, such as a subject research report.
Annual Report of NNSA	NB	It is the annual report on the work carried out by the NNSA in the current year.
Translation version of nuclear and radiation safety related documents	YW	It is divided into translation of nuclear safety codes and translation of nuclear safety professional & technical documents. The translation of the nuclear safety codes is a translation of the documents of the IAEA and relevant national laws and regulations as to nuclear safety. The document serial number is 0XXX. The translation of nuclear safety professional & technical documents is a translation of nuclear and radiation safety technical documents except the translation of nuclear safety codes. Document serial number is 1XXX. For example: NNSA-YW-0001-2016 represents the translation version of the No.1 Nuclear Safety Code in 2016. NNSA-YW-1001-2016 represents the translation version of No.1 nuclear safety professional & technical documents in 2016.

(5) Review, approval and modification of documents

The document reviewer shall have relevant business knowledge and experience and understand the relevant background materials so as to ensure the suitability,

correctness and exercisability of the document contents. Different degrees of control may be imposed on the review and approval of documents based on the significance of documents, such as department review and approval, Department Affairs Meeting/Office Heads Working Meeting review, Administrators Working Meeting/Ministers Special Meeting review, consultation and review of Nuclear Safety and Environment Advisory Committee, review and countersign of relevant ministries and commissions. High-level control shall be imposed on important documents.

During the implementation of the executive documents, the documents shall be revised subject to changes in laws and regulations, adjustments in the organization and division of duties, and changes in working methods and processes. The original procedure for review and approval shall be followed after the revision of the document; and a new version of the document shall be issued to terminate the former version.

(6) Issuance of documents

The MEE (NNSA) issues relevant documents in the name of NNSA certificates, documents, letters and office letters, which are in the form of the GHAZ [XXX] No.X, GHAF [XXX] No.X, GHAH [XXX] No.X and GHABH [XXX] No.X.

Document issued in the name of MEE mainly include review and approval documents for MEE environmental impact report, MEE letter, documents of MEE General Office, letters of MEE General Office and departmental letter of MEE, etc. The review and approval opinions for radiation safety license and the import and export of radioisotopes are issued in the form of certificates or forms, namely GHFZ [XXX] and GHFS [XXX] No.X, after being approved by the leader of MEE.

The business scope of nuclear and radiation safety regulation specified in different types of documents is as follows:

A. Administrative review and approval project issued in the name of MEE

HS [XXX] No.X: approval of the environmental impact report (form) of nuclear and radiation construction projects (reconstruction and decommissioning).

B. Letter of the MEE

HH [XXX] No.X: negotiating with relevant ministries and commissions of the State Council, directly affiliated organizations or the people's governments of relevant provinces, autonomous regions and municipalities; other items that need to be formulated in the name of the MEE.

C. Documents of the General Office of the MEE

HB [XXX] No.X: requesting and reporting to the General Office of the State Council; the documents as to the management of radiation environmental safety

issued to the environmental protection departments (bureaus) of the provinces, autonomous regions and municipalities, and the departments directly under the State Council in the name of the General Office of the MEE, or issuance of general documents such as work plan and work schedule.

D. Letter of the General Office of the MEE

HBH [XXX] No.X: non-general documents regarding the radiation environmental safety management work issued to the environmental protection departments (bureaus) of the relevant provinces, autonomous regions and municipalities or directly affiliated organizations in the name of the General Office of the MEE; negotiation with and reply to relevant ministries and departments and general office of directly affiliated organizations of the State Council or other organizations at the same level for radiation environmental safety management; other items requiring the letter issued in the name of the MEE.

E. Departmental letter of the MEE

HHS/D/FH [XXX] No.X: within the scope of the department duties, non-command and non-general business contacts with relevant organizations of the environmental protection system; general business works regarding the negotiation with or reply to organizations and enterprises and public institutions at the same level with no affiliation relationship. This record type of document letter is limited to letter.

F. Certificate issued in the name of NNSA

Approval and issuance of nuclear safety administrative licenses for nuclear power plants, research reactors, nuclear fuel cycle facilities, radioactive waste processing and disposal facilities, radioactive material transportation, nuclear safety equipment activities, etc. The approval and issuance of the radiation safety license and the approval of the import and export (transfer) of radioisotopes are issued in the name of the MEE.

G. Documents issued in the name of NNSA

- Issuance of technical guidelines and specifications.
- Notification on the issuance of nuclear safety administrative licenses for nuclear power plants, research reactors, nuclear fuel cycle facilities, radioactive waste processing and disposal facilities, radioactive material transportation, nuclear material management and control, emergency plan and nuclear safety equipment activities, etc.
- Approval and issuance of licenses for nuclear power plants and research reactor operators.
- Approval and reply to significant change request and special application of

nuclear power plants, research reactors, nuclear fuel cycle facilities, radioactive waste processing and disposal facilities, radioactive material transportation, nuclear material management and control, emergency plan and nuclear safety equipment activities, etc.

- Approval and reply to the application for next time of criticality after refueling and accident shutdown of the nuclear power plant; the release of the nuclear facility control point.
- Investigation and handling of major nuclear safety events and accidents; administrative penalties for violations of regulations by operating organizations in accordance with legal procedures.
- Other items requiring the issuance of documents in the name of the National Nuclear Security Administration.

H. Letter issued in the name of NNSA

- Approval comments on nuclear material license.
- The quality assurance program of the nuclear facilities, the in-service inspection program, the commissioning and maintenance program, the on-site emergency plan, and the acknowledgment of plan.
- Routine and special regulatory inspection report regarding the nuclear safety of nuclear power plants, research reactors, nuclear fuel cycle facilities, radioactive waste processing and disposal facilities, radioactive material transportation, nuclear material management and control, emergency preparedness and response and nuclear safety equipment activities, etc.
- Analysis and evaluation report on operating events regarding the nuclear power plants, research reactors, nuclear fuel cycle facilities, radioactive waste processing and disposal facilities, radioactive material transportation, nuclear material management and control and nuclear safety equipment activities, etc.
- Letter replying to general changes and modification application regarding the nuclear facilities, radioactive materials transportation, nuclear material management and control, emergency preparedness and response and nuclear safety equipment activities.
- Issuance of minutes of important meetings convened in the name of the NNSA and the meeting of the Nuclear Safety and Radiation Environment Expert Committee, the coordination meeting of the Nuclear Safety Administration and the operating organizations, and the joint meeting of the relevant organizations of the nuclear and radiation system.

- Notice on Holding the Post of Program Officer of Nuclear and Radiation Safety Regulation.
- Other items requiring the issuance of letters in the name of the National Nuclear Security Administration.

I. Letter issued in the name of NNSA Office

- Notice on Acceptance (Rejection) of application for nuclear safety administrative license of nuclear power plants, research reactors, nuclear fuel cycle facilities, radioactive waste processing and disposal facilities, radioactive material transportation, nuclear material management and control, emergency preparedness and response and nuclear safety equipment activities, etc.
- Notice on inspection activities for nuclear safety reviews.
- Notice on general meeting and activities convened in the name of the NNSA.
- The issuance of the minutes of the workshops and other meetings.
- Other items requiring letters issued in the name of NNSA Office.

J. Document of Program Officer

For departments and divisions that implement the system of Program Officer, the document of Program Officer can also be adopted. The document of Program Officer shall be drafted by the Program Officer, reviewed by the Division Head, and approved by the competent Director General of Department. The scope of business mainly includes:

- Transmission of documents and materials between the regional offices and the technical support organizations in the specific review and inspection work after the work task is released by the work order.
- Delivery of questionnaire regarding review to the regulated party after discussing and organizing the review questions.
- Notice on activities such as communication sessions and on-site verification during the project review process.

(7) External document control

Documents intended to be submitted to the MEE (NNSA) shall be reported to the General Office for approval and retransmission and received by the Division of Comprehensive Affairs of each department; documents intended to be submitted to professional departments shall be received by the Division of Comprehensive Affairs of each department. After receiving the document, it is required to register and number the document, and record the time of receipt, the department submitting

document, the main items and requirements of the document and the instructions of the ministerial leaders, etc., and submit it to the person in charge of the Division of Comprehensive Affairs for approval and handling.

In principle, comprehensive documents or important documents, as well as documents requiring countersign (reports requiring signing or official documents) shall be reported to the Department Director General for approval in the first place. Documents with higher requirements for time effectiveness can be first approved and submitted to the Business Office for timely processing. For documents directly approved and retransmitted by the General Office or received by the departments, the Department Director may submit them to the competent Vice Minister for review and approval.

Documents approved by the leader that involve more than two departments (offices) (included) or more than two divisions (offices) within the department (included), with no indication of the competent organization in the leader instruction, it shall be determined in the order of department and division (office) mentioned in the instruction. The first mentioned department or division is the competent organization, and other departments and divisions (offices) shall provide active cooperation. It is required to timely record information such as the requirements of the leadership of the department, the time of retransmission, the signer, and the handling situation.

For other external documents to be managed as described in 5.2.1(2), each professional department, regional office and technical support organization shall be responsible for implementing effective management measures.

The general approval process for documents of the MEE (NNSA) is shown in Figure 5-2. The regional offices and technical support organizations can refer to the above requirements to define their own document approval and control process. For details on document management requirements, refer to NNSA/HQ-00-ZG-AP-003 *Guideline for Document Management*.

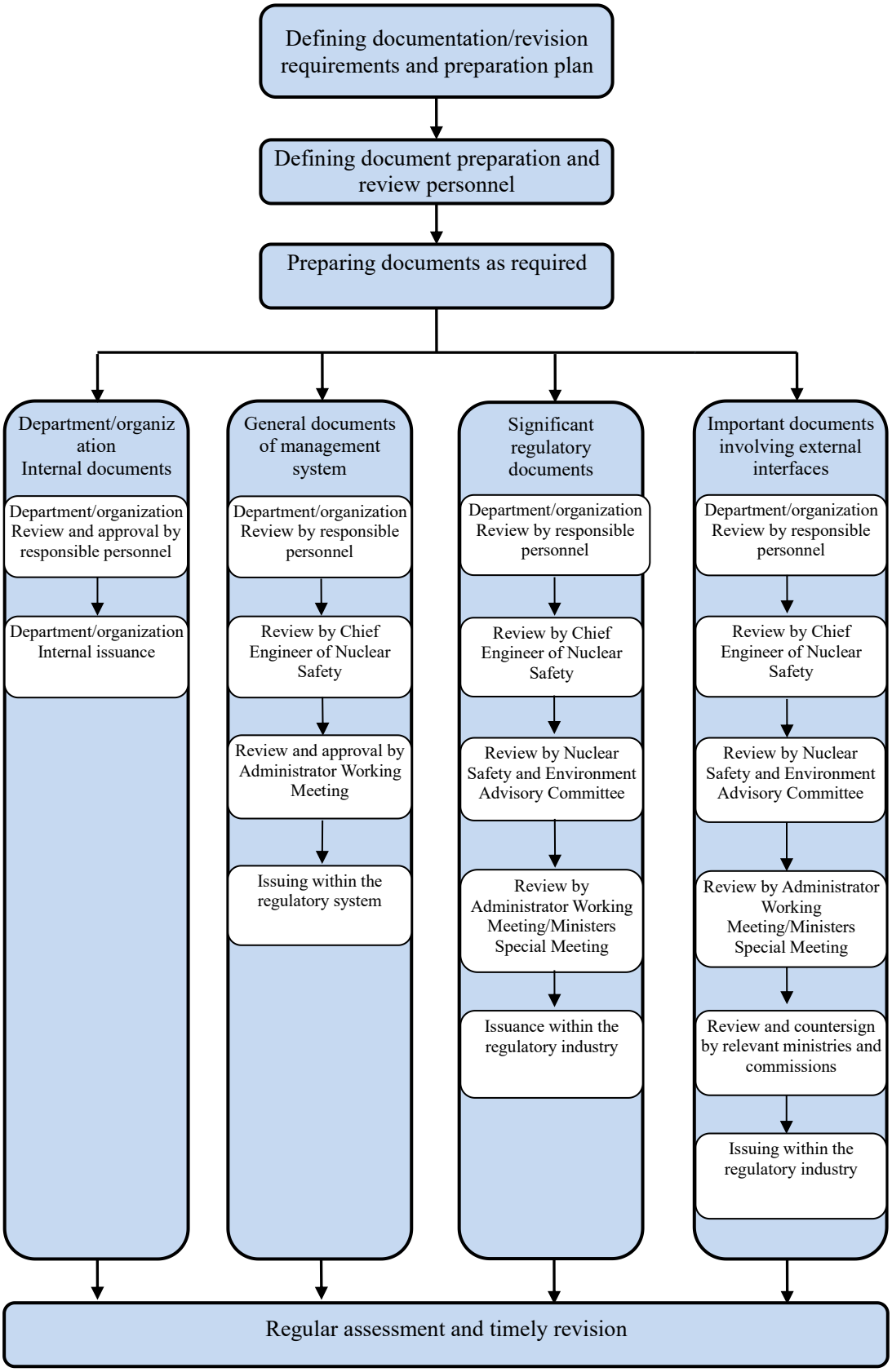


Fig.5-2 Diagram of General Document Approval Process of the MEE (NNSA)

5.2.2 Record Control

(1) Management duties and requirements

The MEE (NNSA) regulates and controls the collection, preparation, distribution, identification, archiving, storage, maintenance and disposal of the records for the documents generated or collected in general management and nuclear and radiation safety regulatory activities, so as to provide objective evidence of effective implementation of the management system and related processes, to preserve, query and use relevant documentation, and to ensure traceability of work.

The MEE (NNSA) implements grading approach and control over records:

- The general documents of the management system can be archived and managed by the department implementing the works;
- The important documents and materials, including the implementation documents and returns regarding the overall operation and the core work processes of the management system, shall be uniformly archived and managed by the records management departments of the departments or organizations;
- Returns of important regulatory activities, such as licensing/approval documents, review reports, nuclear safety inspection reports, codes and standards, annual reports, national reports, etc., shall be submitted to the General Office for archiving.

(2) Main works

The departments and organizations of the MEE (NNSA) shall take the following measures to make effective management of the record control process:

- Identifying document and materials generated or requiring collection at work; developing and effectively implementing record control procedures; clarifying management responsibilities and requirements; systematically collecting, organizing, keeping and maintaining various records to ensure their completeness, applicability, for the convenience of retrieval and use. The coding rules for records are given in 5.2.1(3).
- Various records will be collected, sorted and archived by the archives management department. The electronic archives management platform and database shall be gradually established by adopting the information technology. For documents and materials involving state secrets, it is required to strictly abide by the relevant provisions on the safety and confidentiality of the MEE; strictly abide by the agreement and commitment of both parties on the important documents and materials submitted by the

regulated parties.

- The storage life of various records shall be clear; strict management shall be performed for the borrowing, modification and destruction of records. It is required to regularly check and evaluate the records management status and management facilities, so as to find and correct problems in time.

(3) Storage, management and quality control of records

The project manager responsible for the specific implementation of the regulatory activities of the MEE (NNSA) is responsible for organizing and compiling important documents and records generated or collected during the execution of the project. The documents and records required to be archived by the archives management department of the MEE shall be handed over to the ministerial General Office for archiving; other documents and records shall be managed and archived by each department.

The archiving records shall be clear in writing, standard in format, and objective, true and complete in content, with clear and unique identification, indicating the storage life. Electronic documents shall be submitted and saved at the same time of archiving. Archives management and storage facilities allow easy inquiry and use of the records, and prevent the loss, damage or deterioration during storage. For the monitoring data and the analytical data issued by the radiation environmental laboratory in particular, it is required to indicate the date and the signature of the relevant personnel giving authorization to ensure that the monitoring and analysis results are legal and effective. The archives division shall regularly check the records storage facilities and records management status. If the record needs to be modified or supplemented, it shall be reviewed and approved by the original organization establishing the record or other authorized organization. The date and signature by the personnel giving authorization are required for record modification and supplement.

The general record control process of the MEE (NNSA) is shown in Figure 5-3. Types of important records to be kept by the headquarters, regional offices and directly affiliated organizations are shown in Table 5-2. For details on the management requirements for record control, please refer to NNSA/HQ-00-ZG-AP-004 *Guideline for Records and Archives Management.*

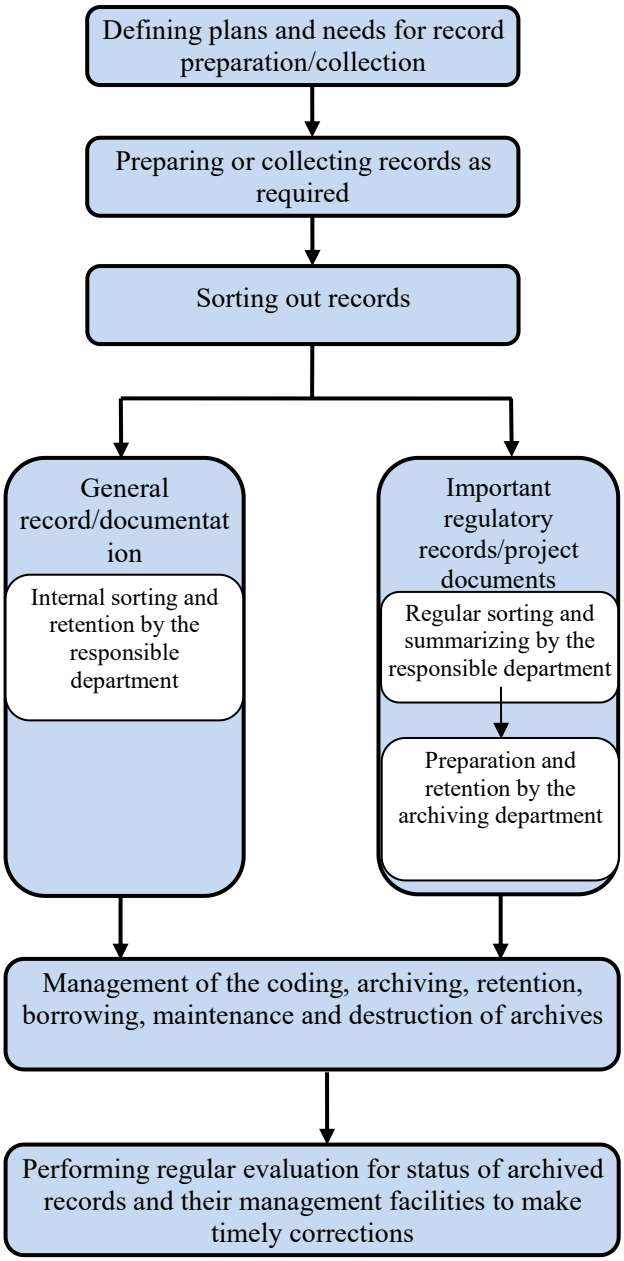


Fig.5-3 Diagram of General Record Control Process of the MEE (NNSA)

5.2.3 Procurement Control

(1) Management duties and requirements

The headquarters, regional offices and directly affiliated organizations of the MEE (NNSA) are responsible for the strict management and control of their procurement activities in accordance with the requirements of the MEE (NNSA) and receiving the instruction and supervision of the DSTF. The procurement department is responsible for the planning, management and implementation of the procurement activities; the use department is responsible for proposing specific procurement

projects and quality requirements, participating in the process inspection, verification and acceptance of important procurement projects; the financial and auditing department is responsible for the inspection and verification of implementation process and contract management of the procurement projects.

The procurement form of the MEE (NNSA) is classified as government centralized procurement, decentralized procurement and self-procurement. The scope and quota standards for centralized procurement shall be in line with the *Government Procurement Law*and the *Bidding and BidLaw*, the *Enforcement Regulations on Bidding and Bid Law* and the annual *Catalogue and Standards for Centralized Government Procumbent of Organizations Covered by the Central Government Budget* promulgated by the State Council. Procurement methods include competitive bidding (including supply in accordance with agreement, fixed-point procurement), limited competitive selected bidding, competitive negotiation, inquiry (including online bidding), single source, etc.

The MEE (NNSA) and its regional offices and directly affiliated organizations must strengthen coordination between each link of budget, planning, procurement, and payment. The procurement expenditure shall be included in the budgets of all organizations for unified accounting, unified management, and overall use.

(2) Contents of main works

The departments and organizations of the MEE (NNSA) shall take the following measures to implement effective control over the procurement process of facilities, equipment and services:

- Identifying the procurement needs, developing and effectively implementing procurement management systems, procedures, and procurement plans, and clarifying responsibilities and requirements. The scope of procurement control mainly includes:

a) Outsourcing of science and technology research and development projects;

b) Procurement of technical support services regarding regulation;

c) Procurement of items and services for important infrastructure construction projects;

d) Procurement of software and hardware platforms, databases, tools and related services regarding regulatory capability building;

e) Procurement of office facilities, equipment and consumables, etc.

- The grading approach shall be performed for procurement activities. For procurement of important items/services or bulk goods, it is required to

develop detailed procurement requirements, invite bidding and select qualified suppliers. Strict management shall be performed for contract negotiation, awarding and implementation.

- During the implementation of the contract, it is required to maintain effective communication with the supplier, review and acknowledge important technical documents, and check and witness important activities. The final submitted items or project deliverable documents shall be reviewed, verified and accepted; the non-conformities shall be controlled until they are effectively resolved.

The flowchart of general procurement control process of the MEE (NNSA) is shown in Figure 5-4. For the details on the management requirements for procurement control, please refer to NNSA/HQ-00-ZG-AP-005 *Instructions for Procurement and Contract Management*.

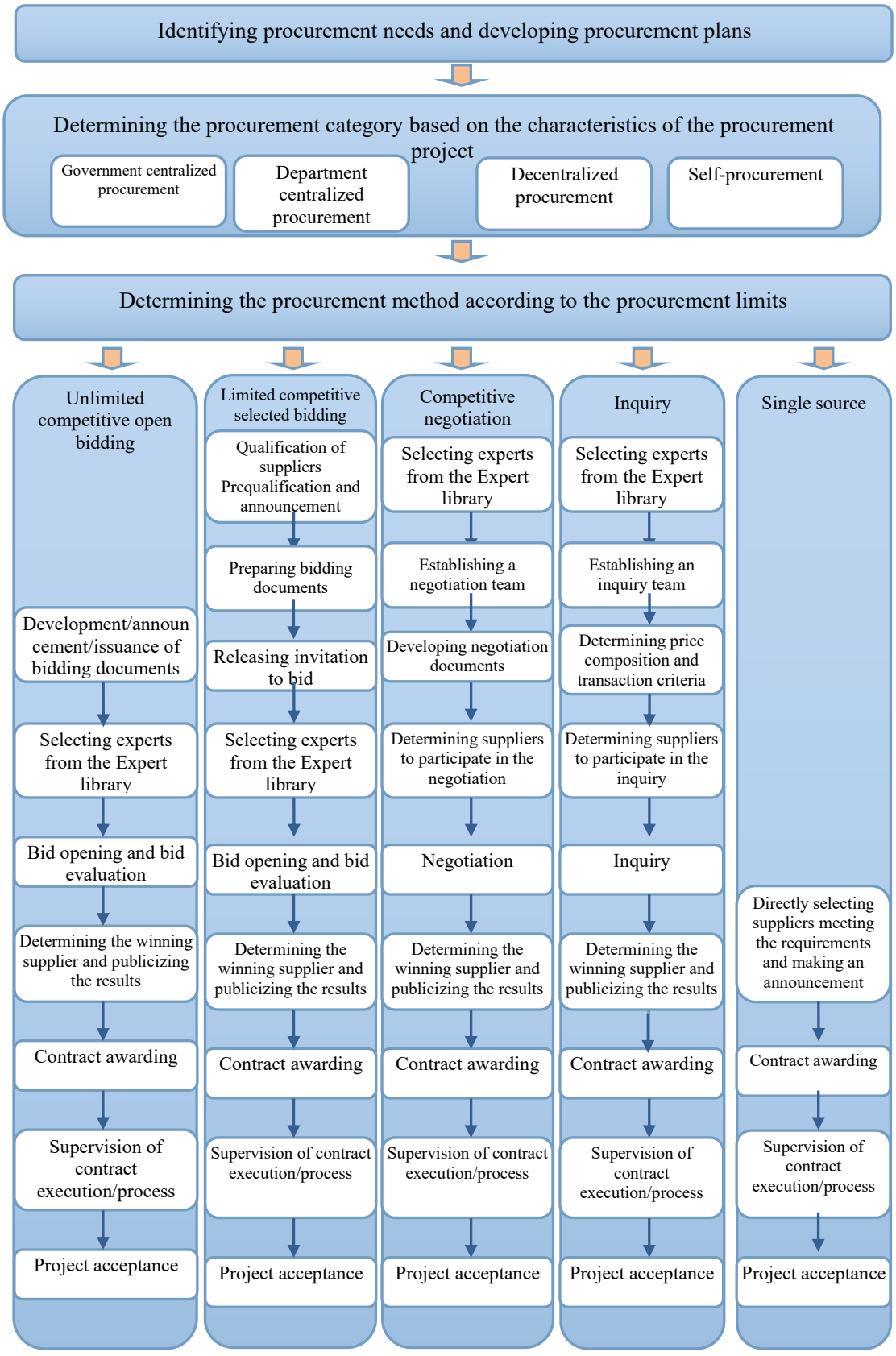


Fig.5-4 Diagram of Significant Equipment and Service Procurement Control Process of the MEE (NNSA)

5.2.4 Communication and Information Disclosure

Good communication and information disclosure are the bases for successful achievement of expected results and an important tool for improving regulatory effectiveness and transparency. The departments and organizations of the MEE (NNSA) will establish appropriate internal and external communication processes between different departments and organizations, strengthen the disclosure of regulatory information, establish vertical and horizontal links at different levels, and enhance mutual understanding and trust, so that all members, the whole industry, and the whole society will participate in nuclear and radiation safety regulation to promote the continuous improvement of nuclear and radiation safety levels.

(1) Internal communication

Managers and staff at all levels of the MEE (NNSA) shall understand the processes and requirements of the management system, their respective responsibilities, work goal and work standards, and communicate in good time to ensure the information required for the work and decision-making is timely available, complete, transparent, and usable, especially when making decisions that affect the normal operation of the organization. All staff shall master the appropriate communication methods and skills.

When a job involves two or more departments, it is required to define the assignment of responsibilities of each participating department, the information to be exchanged during the work, and the division of preparation, review and approval of the interface documents according to the requirements of the relevant procedures. Each department shall also designate a counterpart for each job, responsible for communication in a reasonable manner in daily work.

For internal interfaces and communication, the methods and measures adopted by the MEE (NNSA) include:

- Various formal or informal meetings, such as ministerial affairs meetings, ministerial executive meetings, ministers special meetings, Administrators Working Meetings, department affairs meetings/office heads working meetings, internal technical exchange meetings, information briefings, etc.;
- It is required to prepare and publish periodic reports, special reports and government affairs information, including biweekly scrolling work plan, monthly work plan, weekly inspection report, monthly work report, annual summary, important situation report, nuclear and radiation safety public opinion report, and government affairs information;
- It is required to clarify the vertical and horizontal interface relationships,

contact methods and channels of the three nuclear and radiation safety inspection professional departments, regional offices and technical support organizations. Tasks shall be issued in the form of task order/coordination order;

- Different communication methods such as verbal, written and electronic methods shall be adopted;
- For some sensitive information and data, it is required to follow confidentiality requirements and commitments.

A. Internal meeting system

A1. Ministerial meeting

It is made up of Minister, Vice Minister, members of the ministerial Party group, chief engineers, chief engineers of nuclear safety, responsible persons of the ministry-based discipline inspection and inspection team, and principal responsible persons of various departments. It is convened and presided over by the Minister or entrusted Vice Minister. It is usually held every Monday. The main responsible persons of the emergency center and the agency service center will attend the meeting; the Executive Deputy Head of the Ministerial Internet Information Office (the main responsible comrade of the information center) and the main responsible persons of the census office will attend the meeting dependently. The main responsible persons of the relevant organizations will attend the meeting as needed. The main tasks of the ministerial meeting are:

- Communicating, studying and implementing the guiding principles of the relevant meetings and documents of the Party Central Committee and the State Council as well as the instructions of the Party and state leaders;
- Informing the domestic and international situation, analyzing the ecology and environmental situation, and deploying important work of the MEE;
- Reviewing the draft laws, regulations and departmental rules drafted by the MEE;
- Discussing, deciding, and notifying major items in the work of the MEE;
- Items raised by the Ministers Special Meeting for consideration by the ministerial meeting and other items requiring discussion at the ministerial meeting.

A2. Ministerial executive meeting

It is made up of Minister, Vice Minister, members of the ministerial Party group, chief engineers, chief engineers of nuclear safety, and head of General Office. It is convened and presided over by the Minister or entrusted Vice Minister. It is usually

held every Monday. The responsible persons of the ministry-based discipline inspection and inspection team and main responsible persons of the departments, emergency center, and the agency service center will attend the meeting dependently; the Executive Deputy Head of the Ministerial Internet Information Office (the main responsible person of the information center) and the main responsible persons of the census office will attend the meeting. The main responsible persons of the relevant organizations will attend the meeting as needed. The main tasks of the ministerial executive meeting include:

- Communicating, studying and implementing the guiding principles of the relevant meetings and documents of the Party Central Committee and the State Council as well as the instructions of the Party and state leaders;
- Reviewing ecological and environmental quality standards and pollutant discharge standards;
- Reviewing the water functional zoning, ecological and environmental planning, special planning and schemes, special action plan for comprehensive improvement of ecological environment, major investment arrangements for ecological and environmental protection and their implementation;
- Reviewing the environmental assessment documents of construction projects reported to the State Council for review (approval) and other major construction projects; the environmental assessment for nuclear facilities (nuclear power plants, research reactors and critical devices, nuclear fuel reprocessing plants, high, medium and low-level radioactive waste disposal facilities) siting and environmental assessment for nuclear and radiation related planning;
- Reviewing important notices and reports submitted to the Party Central Committee and the State Council, important general-purpose documents and announcements of the MEE; documents and plans of the ecological and environmental protection work meeting held in the name of the State Council, the national ecological and environmental professional meeting approved by the State Council, and the annual national ecological and environmental protection work meeting held by the MEE; plans of the major activities held by the MEE and attended by the leaders of the Party Central Committee and the State Council; the annual meeting activity plan and the file issuance control plan;
- Plans and results of activities such as appraisal, attaining the required

standard, commendation, and demonstration performed in the name of the MEE;

- Discussing, deciding, and notifying major items in the work of the MEE; listening to reports on progress of significant activities and inspection of significant items;
- Significant items raised by the Ministers Special Meeting for consideration by the ministerial executive meeting and other items requiring discussion at the ministerial executive meeting.

A3. Ministerial leaders meeting

It is made up of Minister, Vice Minister, members of the ministerial Party group, chief engineers, and chief engineers of nuclear safety. It is convened and presided over by the Minister. It is usually held every Monday. The responsible persons of the ministry based discipline inspection and inspection team and main responsible persons of the departments, emergency center, and the agency service center will attend the meeting; the Executive Deputy Head of the Ministerial Internet Information Office (the main responsible comrade of the information center) and the main responsible persons of the census office will attend the meeting dependently. The main task is to report the progress of the recent daily routine management work, and to study the deployment of the next task.

A4. Ministers Special Meeting

Discussing and deciding specific business items in the work of the MEE; The Minister will convene and preside over the Ministers Special Meeting attended by the Vice Minister, the Party group members, the chief engineer, the nuclear safety chief engineer, and main responsible persons of the relevant departments and organizations. The leaders at the Vice Ministerial level shall convene and preside over the Ministers Special Meeting attended by the chief engineer, the chief engineer of nuclear safety, and the responsible persons of relevant departments and organizations in accordance with the division of duties and needs, and may invite other ministerial leaders to participate as needed. It shall be convened from time to time based on the needs. The responsible person of relevant departments and organizations will attend the meeting. Its main tasks are to study the items that need to be submitted to the ministerial affairs meeting and the ministerial executive meeting for review, and to coordinate and handle specific items in the daily management.

A5. Administrators Working Meeting

It is convened and presided by the Administrator of the NNSA or the entrusted Deputy Administrator. The Administrator and Deputy Administrator s will attend the

meeting. In principle, the Administrators Working Meeting will be held once a month. In case of emergency, it can be held at any time. Responsible personnel of the relevant regional offices and the directly affiliated organizations may attend the meeting based on the needs. The main tasks of the Administrators Working Meeting include:

- Communicating, studying and implementing the guiding principles of relevant meetings, documents and instructions;
- Reviewing and proposing suggestions to major decisions and important items concerning nuclear and radiation safety to be made by the Party group, ministerial affairs meetings, and ministerial executive meetings.
- Reviewing nuclear and radiation safety related policies, rules, plans, codes, standards, project plans and budgets, and research projects;
- Reviewing important administrative review items and major special projects regarding nuclear and radiation safety;
- Deploying key works regarding nuclear and radiation safety;
- Studying the important works of each directly affiliated organization and regional offices;
- Other important items that need to be discussed by the Administrators Working Meeting.

For projects involving policy, planning, codes, standards, systems, budget, science and technology R&D that requires the participation of other departments (administrations) of the ministry, the Administrators Working Meeting may be held together with the Ministers Special Meeting.

B. Internal Reporting System

B1. Special Report

- Notification of important situation

The notification of important situation represents a kind of information report prepared by the regional offices and nuclear and radiation safety center, approved by the major leader of corresponding organization, reported to the responsible Deputy Director and chief engineer of nuclear safety for review and copied to Department of Nuclear Facility Safety Regulation, Department of Nuclear Power Safety Regulation and Department of Radiation Source Safety Regulation.

- Report on public opinion regarding nuclear and radiation safety

The report on public opinion regarding nuclear and radiation safety is an overview of the two-week public opinion and includes the analysis, study, judgment and recommendations on the public opinion. It is prepared by the professional departments of nuclear and radiation safety regulation and the Nuclear and Radiation

Safety Center, submitted to the Minister and Vice Minister (Director), Chief Engineer of Nuclear Safety and Department Director General of the professional departments of nuclear and radiation safety regulation, and copied to the General Office, Department of Nuclear Facility Safety Regulation, Department of Nuclear Power Safety Regulation and Department of Radiation Source Safety Regulation, International Department, Department of Publicity and Education, regional offices, nuclear power department of National Energy Administration, Department II of the State Administration of Science, Technology and Industry for National Defense and the Nuclear Emergency Department. In case of emergency, it will be prepared by the professional departments and the Nuclear and Radiation Safety Center, submitted to the Minister and Vice Minister (Director), Department Directors of the professional departments of nuclear and radiation safety regulation after being approved by the major leader of corresponding organization, and copied to the General Office, Department of Nuclear Facility Safety Regulation, Department of Nuclear Power Safety Regulation and Department of Radiation Source Safety Regulation, International Department, Department of Publicity and Education, regional offices, electric power department of National Energy Administration, Department II of the State Administration of Science, Technology and Industry for National Defense and the Nuclear Emergency Department.

B2. Periodic Report

- Biweekly scrolling work plan
- Monthly work plan
- Weekly inspection report
- Work briefings
- Annual summary

B3. Information of Government Affairs

It provides important information for departments at all levels as an important reference for developing policies and guiding regulation. It is timely, dynamic, comprehensive, policy related and authoritative. The nuclear and radiation safety regulation departments, regional offices and technical support organizations are responsible for the preparation and compilation of their respective information. After approval by the Department Director General of the professional department, such information shall be uploaded to the intranet of the MEE (NNSA) by the nuclear and radiation safety regulation departments, regional offices and technical support organizations themselves. The main contents include:

- Important status of the implementation of the laws, regulations, policies,

measures, and important central works;

- Brief situation of the implementation of major decision-making and deployments, the guiding principles of important meetings and documents, and important leadership instructions of higher-level governments and departments;
- New situations, new measures and new experiences of main departments and organizations in the industry; public reflections on nuclear and radiation safety work issues, and the movement of nongovernmental organizations;
- Difficulties, problems and suggestions for nuclear and radiation safety related work;
- Important status of international environmental exchanges and cooperation, important achievements of environmental scientific research, opinions and suggestions provided by experts and scholars;
- Outstanding contributions, important achievements and typical deeds of the official and employees of this system;
- Important investigation reports and trends of oriented, dynamic and comprehensive policies;
- The important work and activities attended by the leaders of ministries and administrations as well as major business work and activities;
- Special information report submitted to the General Office of the CPC Central Committee and General Office of the State Council, including dynamic report and research report;
- Work deployment for shifts during festivals and holidays; record and summary of shift arrangement and on-duty works.

(2) External communication

A Communication with regulated parties

Regulators and regulated parties should keep open, appropriate, adequate and transparent communication and exchange, and establish mutual understanding, trust and support to ensure the transparency and effectiveness of nuclear and radiation safety regulation. Communication with licensees related to nuclear facilities, nuclear technology utilization and nuclear safety equipment shall be planned, organized and implemented by each professional department according to the assignment of responsibilities. Communication methods mainly include:

- Nuclear facilities/activities reporting system, including periodic reports, notifications of important activities, event reports, emergency event reports, etc.;

- Regular/irregular review dialogues and regulation dialogues with regulated parties;
- Organization of experience exchange meetings, information briefings, etc.;
- Oral, written, electronic and other different communication methods;
- Adherence to relevant confidentiality requirements and commitments for some sensitive information and data.

B Communication with the public and the media

The healthy, sustained and stable development of nuclear safety cannot be achieved without extensive participation, understanding, supervision and support from the public and the media. Department of Nuclear Facility Safety Regulation is responsible for the overall planning, and organizing the implementation of communication with the public and the media, with the cooperation of other relevant departments and organizations.

Main methods of communication with the public and the media mainly include:

- Important information about supervision activities is issued in time on the official website of the MEE(NNSA) (hereinafter referred to as MEE (NNSA), such as license issuance, important review and supervision activities and their results, reports on construction and operation events of nuclear facilities, radiation environmental monitoring results, and relevant information on nuclear and radiation accident emergency;
- Publicize the knowledge and information related to nuclear and radiation safety through websites, newspapers, periodicals, TV, publications and publicity materials;
- Set up a public opinion monitoring team to keep abreast of public opinion dynamics and organize experts to reply and respond to public concerns in a timely manner;
- Solicit public opinions by information publicity, distributing investigation questionnaires, and holding symposiums and hearings before the release of important regulatory documents or decisions and accept public questioning and supervision;
- Invite the media to participate in important experience exchange activities on nuclear safety regulation, and organizing experts to answer and explain questions of public concerns at media.

C Communication and cooperation with other government agencies

In order to carry out its regulatory duties, the MEE (NNSA) has business-related interface with the National Security Commission, the Ministry of Foreign Affairs, the

National Development and Reform Commission, the Ministry of Science and Technology, the Ministry of Justice, the Ministry of Finance, the Ministry of Human Resources and Social Security, the Ministry of Natural Resources, the Ministry of Commerce, the Ministry of Emergency Management, the National Audit Office, the National Atomic Energy Agency, the General Administration of Customs, the China Meteorological Administration, the National Energy Administration, local department of ecology and environment, etc. Daily communication with the above-mentioned government agencies is mainly planned and organized by each professional department under the MEE (NNSA) and supported and coordinated by its corresponding functional departments. Communication methods include written and oral forms, dialogues or the establishment of joint working groups.

D. Exchange and cooperation with other countries or international organizations

Main international partners of the MEE (NNSA) include the nuclear safety regulation authorities and their technical support organizations of the United States, France, Japan, South Korea, Pakistan and other countries with regard to bilateral and regional cooperation, and international agencies such as the IAEA, the OECD NEA and the EU in respect of multilateral cooperation.

The International Department is responsible for the centralized liaison, communication and coordination of the above interfaces, and the other relevant professional departments provide supports. Main methods include: oral and correspondence exchange, periodic communication dialogues, international experience exchange and discussion, participation in the formulation of laws and regulations, performance of conventions, construction of nuclear safety networks in Asia and worldwide, exchange visits and trainings, regular information interchange, participation in joint research and other related activities and meetings, etc.

E. Communication and cooperation with suppliers and external technical support organizations

The responsible department or organization of the MEE (NNSA) that signs procurement or consignment agreements shall designate a counterpart contact person for daily communication and liaison with suppliers and external technical support organizations during project implementation, ensuring that both parties can reach an agreement on the specific requirements of the contract or agreement. Important information between both parties shall be transferred in written form and corresponding records shall be kept.

The managers of the MEE (NNSA) shall establish a long-term and stable

partnership with suppliers and external technical support organizations based on a long-term strategic perspective. However, it is also necessary to check and evaluate their independence on a regular basis when providing regulatory supports. Once any violation of the principle of regulatory independence is found, it shall be stopped in a timely manner and the supplier or technical support organization shall be disqualified if necessary.

(3) Disclosure of information on nuclear and radiation safety regulation

According to the states requirements on disclosure of government affairs for government departments at all levels, the MEE (NNSA) has formulated the *Guideline for Communication with the Public on Nuclear and Radiation Safety* and the *Information Disclosure Plan for Nuclear and Radiation Safety Regulation*, which clearly define the scope of application, assignment of responsibilities, and contents, timing, methods and channels of information disclosure.

The General Office of the MEE (NNSA) is the leading department for disclosure of government affairs. The nuclear and radiation safety regulation information disclosure is under the centralized management of Department of Nuclear & Radiation Safety Regulation of MEE (NNSA). Each professional department handles the review and approval of information disclosure related to its own business as required according to the assignment of responsibilities, and prepares the annual summary of information disclosure.

The provincial ecology and environment department where the nuclear facility is located is responsible for the information disclosure of radiation environmental monitoring data around the facility. The Radiation Monitoring Technology Center is responsible for the disclosure of national or regional radiation environmental monitoring data and information. The Nuclear and Radiation Safety Center is responsible for the operation and maintenance of the NNSA (NNSA) website and WeChat and the distribution of their information.

A. Principles and main contents of information disclosure

Information disclosure follows the principles of fairness, objectivity, timeliness and convenience for people. Information on nuclear and radiation safety regulation within the scope of its duties is disclosed in accordance with the appropriate approved procedures and work requirements. The content of information disclosure is divided into three categories: social disclosure, internal disclosure and non-disclosure.

Social disclosure: It is divided into two types, daily regulation information and sensitive information. Main contents of the daily regulation information include: national nuclear and radiation safety laws, regulations, guidelines, standards, policies

and planning, administrative licensing related to nuclear and radiation safety, public announcement and notification information on acceptance, proposed approval and approval of EIA (EIA) documents during the construction phase of nuclear facility projects, safety inspection reports on nuclear safety-related activities, overall safety status of nuclear facilities, radiation environmental quality, and other information required to be disclosed as stipulated by laws and administrative regulations. Public opinion risks should be investigated and judged before sensitive information is disclosed. After information release, the corresponding nuclear and radiation safety regulation professional department shall organize and carry out public opinion collection and guidance in accordance with the procedures on monitoring of public opinion on nuclear and radiation safety and relevant contingency procedures. Sensitive information includes, but is not limited to, project approval information, nuclear facility safety event information, nuclear facility safety regulatory inspection reports, experience feedback, event evaluation or investigation reports that are prone to attract public attention, and other highly sensitive information that may cause widespread public attention after disclosure.

Internal disclosure: In addition to information required by laws and regulations to be disclosed to the public, information related to important processes of regulation activities, such as important nodes, key links, major items, important planning and plans, etc., which are not classified or sensitive, can be disclosed internally within the MEE (MEE).

Non-disclosure: According to the *Basic Catalogue for Active Disclosure of Government Information of the MEE* and the *Provisions on the Scope of State Secrets for Environmental Protection*, nuclear and radiation safety regulation information exempted from disclosure and falling within the scope of state confidentiality shall not be disclosed.

B. Methods and processes of information disclosure

Relevant information is disclosed to the public in a timely and accurate manner in accordance with the law, mainly through the NNSA website, official microblog, official WeChat public accounts, China Environmental News, official journals, annual reports, administrative service halls and other means accessible for the public to know. Citizens, legal bodies and other organizations may, in accordance with laws, apply for nuclear safety related information to the Nuclear and Radiation Safety Regulation Department under the State Council, the competent department of nuclear facilities and the provincial People’s government where the nuclear facilities are located. The disclosure of government information involving state secrets, commercial secrets and

personal privacy, such as nuclear materials and nuclear facilities security and safeguard, shall be carried out in accordance with the relevant national provisions. See Figure 5-5 for the disclosure process of nuclear and radiation safety regulation information.

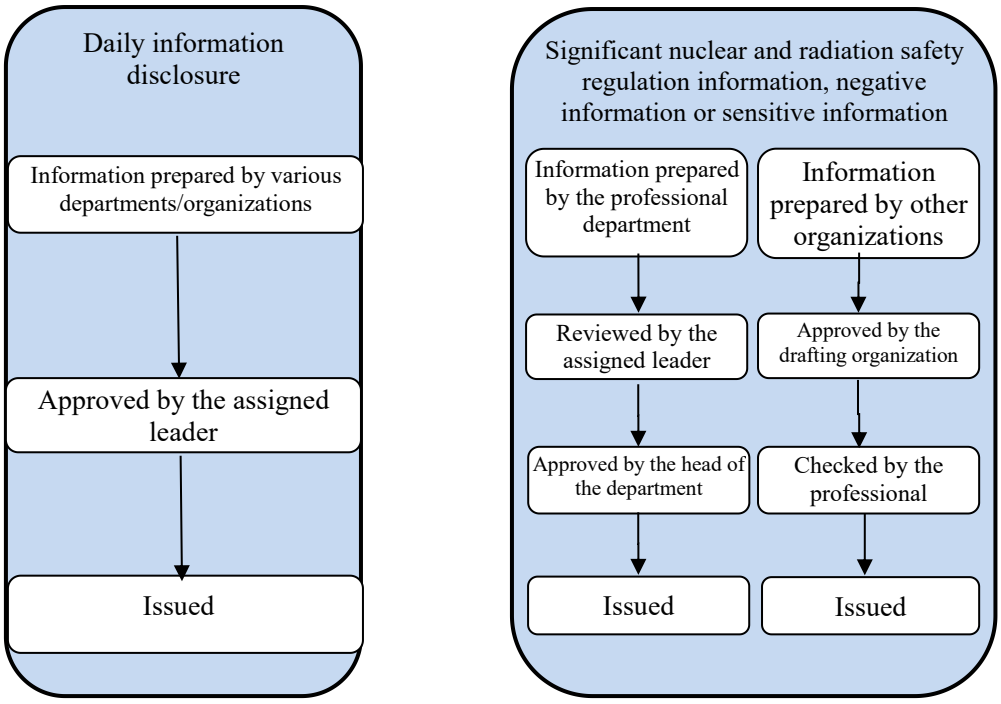


Figure 5-5 Disclosure Process of Nuclear and Radiation Safety Regulation Information of the MEE (NNSA)

C. Administrative reviewing and approving items to be announced/notified by the MEE (NNSA)

- Issuing of operator licenses for civil nuclear facilities;
- Reviewing comments on siting of civil nuclear facilities;
- Issuing of construction permits for civil nuclear facilities;
- Issuing of operating licenses for civil nuclear facilities;
- Reviewing and approving of civil nuclear facilities decommissioning;
- Reviewing and approving of EIA documents for nuclear and radiation construction projects;
- Approving of civil nuclear material permits;
- Issuing of welder qualification certificates for civil nuclear safety equipment;
- Issuing of permits for design, manufacture, installation and NDT organizations of civil nuclear safety equipment;
- Issuing of registration confirmation certificates for overseas organizations of civil nuclear safety equipment;
- Issuing of qualification certificates for NDT personnel of civil nuclear safety equipment.

D. Important regulatory documents publicly released by MEE (NNSA)

- Approving and issuing of administrative permits or licenses for nuclear facilities/activities;
- Release of nuclear and radiation safety standards, technical guidelines and specifications;
- Investigation and disposal of major nuclear safety events and accidents, as well as administrative penalties imposed on operating organizations in breach of laws and regulations in accordance with legal procedures;
- Routine and non-routine regulatory inspection reports on nuclear safety;
- Analysis and evaluation reports on operation events of nuclear facilities/activities;
- Issuance of important minutes of meetings from the Nuclear Safety and Environment Expert Commission, the coordination meeting of the Nuclear Safety Administration and operating organizations, and the joint meeting of relevant organizations of the nuclear and radiation system.
- Notification on acceptance (rejection) of application for nuclear safety administrative licensing for nuclear facilities/activities and nuclear and radiation safety licenses;
- Notification on surveillance activities for nuclear safety review, etc.

See NNSA/HQ-00-ZG-AP-002, *Guideline for Conference Management*, NNSA/HQ-00-ZG-AP-006, *Guideline for Internal Information Reporting* and NNSA/HQ-00-XG-MP-007, *Guideline for Communication with the Public on Nuclear and Radiation Safety* for detailed management requirements on communication and information disclosure.

5.2.5 Organization Change Management

China's nuclear and radiation safety management system is established under specific internal and external conditions, while the internal and external conditions of the organization is always changing. Various departments and organizations of the MEE (NNSA) shall continuously monitor these changes, analyze the impact of changes in the internal and external conditions on the management system, organizational goals, policies and strategies of regulatory bodies, and make adjustments and changes accordingly to adapt to the changing needs.

Main factors affecting organizational changes include:

- Major adjustments in national nuclear energy development policies and planning;

- Major changes in the states social and political environment;
- Important adjustments in the national management model or the scope of regulatory functions;
- Transfer and change of nuclear facilities at important stages;
- Introduction or innovation of new reactor types, new technologies, new materials and new processes;
- New requirements from international safety standards and national laws and regulations;
- Development and change of nuclear and radiation safety review and inspection techniques;
- Important changes in the organizational structure or management mode of the regulated party;
- Trends in the safety performance of the regulated party;
- Improved requirements and expectations on nuclear safety by the public and other parties concerned.

In order to respond to the new situation, new tasks and new requirements, the MEE (NNSA) should fully consider the potential risks that may be caused by changes in organizational structure and management mode, as well as the relevant factors and processes affected, when planning and implementing organizational changes and management system improvement, and then make an overall, unified arrangement.

5.3 Core Processes

5.3.1 Formulation of Codes, Standards and Policy Planning

(1) Work basis and assignment of responsibilities

Codes and standards and policy planning on nuclear and radiation safety are the basis for all regulatory activities. According to the relevant national laws and regulations and the division of functions of government departments under the State Council, the MEE (NNSA) is responsible for preparing and formulating policies, planning, laws, administrative regulations, departmental rules, systems, standards and specifications related to nuclear safety, radiation safety, electromagnetic radiation, radiation environmental protection, and nuclear and radiation accident emergency response, and organizing the implementation.

The Regulation and Standard Department under the MEE (NNSA) is responsible for the centralized management of coordination, review and report for approval of regulations, standards and relevant policies and planning, providing relevant support

and guidance to the professional department. Department of Nuclear & Radiation Safety Regulation is responsible for drawing up the draft laws and regulations on nuclear and radiation safety, and formulating relevant policies, planning and standards.

(2) Basic principles and requirements

The formulation of nuclear and radiation safety regulations, standards and policy planning should adhere to the general principles of being systematic, scientific, open, transparent, rigor and law-based. Not only the international advanced experience shall be assimilated to ensure that the regulatory contents are consistent with the latest international safety standards, but also the systematic structure and contents of China's regulations shall be complete, stable, continuous, self-consistent and inter-coordinated, to fully reflect the actual needs and practical experience of China's nuclear safety regulation and improve operability.

The formulation and revision of the laws should be incorporated in the legislative plan of the National People's Congress, and their drafts and formulation instructions should be submitted to the National People's Congress or its Standing Committee for deliberation and approval by vote. The formulation and revision of administrative regulations shall be incorporated in the legislative plan of the State Council and submitted to its Legislative Affairs Office for deliberation and then review and approval by the State Council. The formulation and revision of departmental rules should be incorporated in the legislative plan of the MEE (NNSA) and submitted to the ministerial meeting for deliberation and approval.

(3) Main work content

All departments and organizations of the MEE (NNSA) shall take the following measures to effectively control the formulation and revision process of codes and standards and policy planning:

- Conduct extensive investigation, identify formulation requirements of codes and standards and policy planning, make overall planning for their preparation, and submit them to the relevant organization for review and approval.
- Establish a working group, formulate a work plan, prepare a draft document, submit them to experts and relevant authorized organizations for review, investigation and demonstration, and solicit public opinions through public announcement.
- After document release, relevant organizations and personnel shall be trained and publicized to reach a consensus and ensure the effective implementation

of laws, regulations, standards and policy planning.

- Carry out mid-term inspection or post-evaluation on the implementation, and revise regulations and standards or make planning adjustments in a timely manner if necessary.
- Formulate and keep updated the list of the latest applicable code and standard documents on nuclear and radiation safety. Evaluate systematically the suitability of the current code and standard system on a regular basis, and make supplement, revision or improvements in a timely manner as required.

(4) Coding rules for regulatory documents, including nuclear safety regulations and guides

NNSA's system regulatory documents include nuclear and radiation safety regulations (code name: HAF), regulatory normative documents on nuclear and radiation safety (code name: HAG), nuclear and radiation safety guides (code name: HAD), and technical documents on nuclear and radiation safety (code name: HAJ).

1) Nuclear and radiation safety regulations

Nuclear and radiation safety regulation (HAF) documents are classified into 10 series according to the technical areas they cover. The specific standard coding format is: HAFxxx/yy/zz-nnnn, where “HAF” is the abbreviation of Chinese phonetic alphabet for nuclear and radiation safety regulations. The first “x” among “xxx” is the code of each series, and the second and third “xx” is the sequence number; “yy/zz” is the code of the nuclear safety regulations or the corresponding detailed rules for implementation and their annexes; “nnnn” is the year of approval and issuance. The arrangement of each series of regulations is as follows:

- HAF0xx/yy/zz-nnnn General series
- HAF1xx/yy/zz-nnnn Nuclear power plant series
- HAF2xx/yy/zz-nnnn Research reactor series
- HAF3xx/yy/zz-nnnn Non-reactor nuclear fuel cycle facility series
- HAF4xx/yy/zz-nnnn Radioactive waste management series
- HAF5xx/yy/zz-nnnn Nuclear material control series
- HAF6xx/yy/zz-nnnn Civil nuclear safety equipment regulation series
- HAF7xx/yy/zz-nnnn Radioactive material transportation regulation series
- HAF8xx/yy/zz-nnnn Radioisotopes and radiation-emitting device regulation series
- HAF9xx/yy/zz-nnnn Radiation environmental series

2) Normative documents on nuclear and radiation safety regulation

Normative documents on nuclear and radiation safety regulation (code name:

HAG) are the general term of administrative documents that are formulated and issued by NNSA within its statutory scope of responsibilities in accordance with statutory procedures for the safety technical requirements and safety management requirements of nuclear safety management personnel concerned, which are generally binding and can be applied repeatedly. They include policy statements, management measures, management procedures, management requirements, detailed rules for implementation, comments, insights, action guidance, technical roadmaps, licensing files, qualification review and approval documents, etc.

Normative documents on nuclear and radiation safety regulation are classified into 10 series according to the technical areas they cover, corresponding to nuclear safety regulations. Such documentations are time-sensitive, so their release, implementation, revision and annulment should be announced on the corresponding platforms (annual reports or websites, etc.).

Their specific coding standard format is: HAGxxx/yy-nnnn, where “HAG” is the abbreviation of Chinese phonetic alphabet for normative documents on nuclear and radiation safety regulation; “xxx” is the code of the corresponding host nuclear and radiation safety regulations; “yy” is the sequence number; “nnnn” is the year of approval and issuance.

HAG0xx/yy-nnnn General series
HAG1xx/yy-nnnn Nuclear power plant series
HAG2xx/yy-nnnn Research reactor series
HAG3xx/yy-nnnn Non-reactor nuclear fuel cycle facility series
HAG4xx/yy-nnnn Radioactive waste management series
HAG5xx/yy-nnnn Nuclear material control series
HAG6xx/yy-nnnn Civil nuclear safety equipment regulation series
HAG7xx/yy-nnnn Radioactive material transportation regulation series
HAG8xx/yy-nnnn Radioisotopes and radiation-emitting device regulation series
HAG9xx/yy-nnnn Radiation environmental series

3) Nuclear and radiation safety guides

Nuclear and radiation safety guides (HAD) are inferior to the document system of nuclear and radiation safety regulations (HAF). The coding principle of nuclear and radiation safety guides corresponds to that of nuclear and radiation safety regulations, and is also classified into 10 series according to technical areas. The specific coding standard format is: HADxxx/yy-nnnn, where “HAD” is the acronym of Chinese phonetic alphabet for nuclear and radiation safety guides; “xxx” is the code of the corresponding host nuclear and radiation safety regulations; “yy” is the sequence

number; “nnnn” is the year of approval and issuance.

HAD0xx/yy-nnnnn General series

HAD1xx/yy-nnnn Nuclear power plant series

HAD2xx/yy-nnnn Research reactor series

HAD3xx/yy-nnnn Non-reactor nuclear fuel cycle facility series

HAD4xx/yy-nnnn Radioactive waste management series

HAD5xx/yy-nnnn Nuclear material control series

HAD6xx/yy-nnnn Civil nuclear safety equipment regulation series

HAD7xx/yy-nnnn Radioactive material transportation regulation series

HAD8xx/yy-nnnn Radioisotopes and radiation-emitting device regulation series

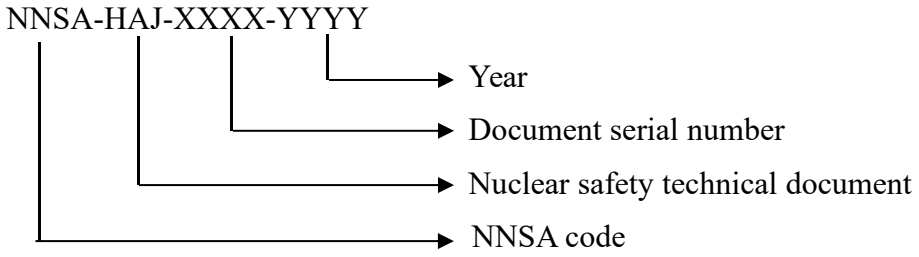
HAD9xx/yy-nnnn Radiation environmental series

4) Technical documents on nuclear and radiation safety

Technical documents on nuclear and radiation safety (HAJ) include nuclear safety regulation technical documents and specialized nuclear and radiation safety technical documents, such as technical procedures, technical guidance, technical evaluation, technical standard formats and contents, technical manuals, technical insights, design guidelines, safety guidelines, technical reports, etc.

As the NNSA's directory document on nuclear safety technology, the technical documents on nuclear and radiation safety are prepared generally based on the technical publications of the IAEA or other agencies, drawing on foreign nuclear safety technology information, and prepared by incorporating China's specific engineering and management practices. The specialized nuclear safety technical documents are special technical documents that are generated during the nuclear safety inspection and evaluation activities by NNSA, and summarize and describe procedures, methods and practical experiences in the safety regulation practice of specific nuclear facilities.

The coding method of nuclear safety technical documents is as follows. For document serial number, 0XXX represents regulatory technical documents and 1XXX represents specialized technical documents. For example, NNSA-HAJ-0001-2015 represents the NNSA's No.1 Document of legislative nuclear safety technical documents of the year of 2015.



The general process for the formulation of nuclear and radiation safety codes and standards and policy planning is shown in Figure 5-6, and the relevant management requirements are detailed in NNSA/HQ-00-ZG-MP-001, *Guideline for the Formulation and Revision of Nuclear and Radiation Safety Policy Planning and Codes and Standards*.

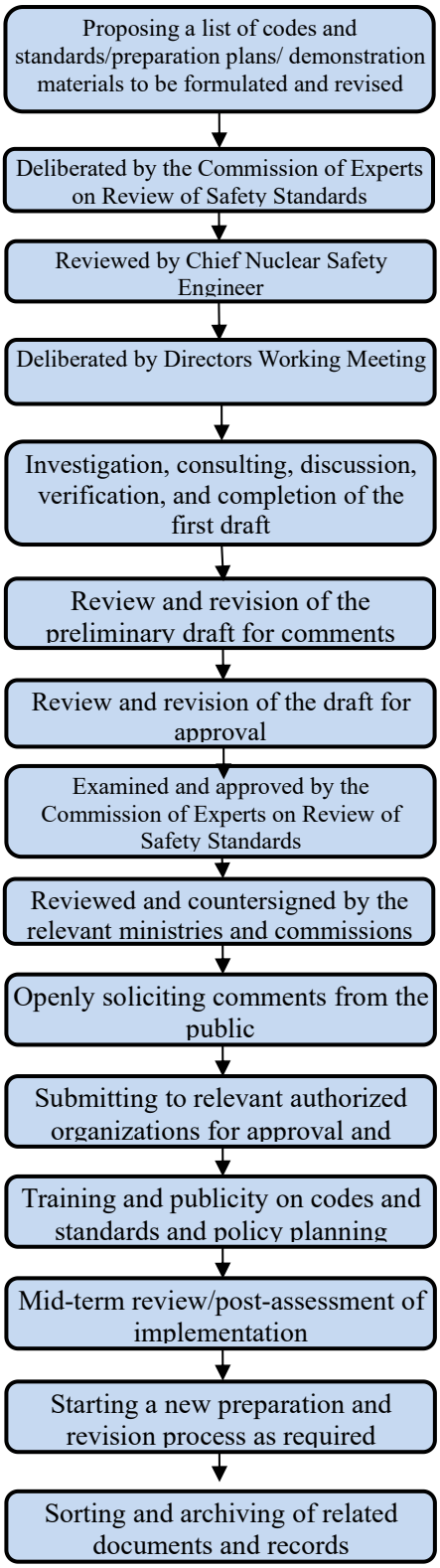


Figure 5-6 General Process for the Formulation of Nuclear and Radiation Safety Codes and Standards and Policy Planning

5.3.2 Nuclear and Radiation Safety Review and Licensing

(1) Work basis and assignment of responsibilities

According to the relevant nuclear safety laws and regulations, various departments and organizations of the MEE (NNSA) plan and organize the implementation of safety review and licensing activities for the nuclear facilities/activities within their responsibilities:

- **Department of Nuclear Facility Safety Regulation:** Be responsible for the approval of nuclear material control, safety review and licensing of nuclear safety equipment design, manufacture, installation and NDT activities, and qualification management of personnel important to safety.
- **Department of Nuclear Power Safety Regulation**: Be responsible for safety review and licensing of nuclear safety, radiation safety and radiation environmental protection of nuclear facilities, including nuclear power plants, research reactors, critical assemblies, etc.;
- **Department of Radiation Source Safety Regulation**: Be responsible for safety review and licensing of nuclear fuel cycle facilities, radioactive waste treatment and disposal facilities, nuclear facilities decommissioning projects, nuclear technology utilization projects, uranium (thorium) mines and associated radioactive mines, electromagnetic radiation-emitting devices and facilities, and nuclear safety, radiation safety and radiation environmental protection in the transportation of radioactive materials.

The specific implementation of safety review task is mainly undertaken by internal and external technical support organizations. The Nuclear and Radiation Safety Center is fully responsible for the evaluation of various projects and is subject to the guidance and supervision by the professional department. For important projects, external technical support organizations are assigned to carry out parallel safety review, to ensure the suitability and correctness of review conclusions.

(2) Purpose of safety review

The purpose of safety review is intended to determine whether the documents submitted by the license applicant meet the requirements of the national nuclear safety codes and standards, and whether there are sufficient safety measures to protect the plant personnel, the public and the environment from excessive radiation. Nuclear and radiation safety review is the technical basis of nuclear facilities/activities licensing system. Only after their pass in the safety review can the MEE (NNSA) issue a license to allow the licensee to carry out relevant activities in accordance with law.

The purpose of the review of different nuclear power plant licenses is as follows:

- **Review Comments on NPP Siting**: To determine the suitability between the nuclear power plant and the selected site from a safety perspective.
- **Construction License of NPP**: To review the design principles of NPP, and draw conclusions on whether the design of NPP meets the requirements of nuclear safety codes and standards and whether the NPP can operate safely after completion.
- **Operating License of NPP:** To determine whether the results of trial operation are consistent with the design, and check and approve the revised operating limits and conditions.
- **Approval for NPP Decommissioning:** To determine whether the decommissioning steps of NPP and the status of each decommissioning stage meets the safety requirements.

The MEE (NNSA) organizes technical support organizations to conduct a comprehensive review and evaluation for the application materials submitted by nuclear facilities/activities organizations in accordance with the requirements of nuclear and radiation safety-related codes and standards, to confirm:

- Nuclear facilities/activities are consistent with safety objectives, principles and guidelines;
- The information in the materials submitted by the operator is accurate, can prove that the facilities or activities are safe and meet the regulatory requirements;
- Technical solutions, especially new solutions, can reach required safety level as proved or examined by inspection / test or both.

(3) Main work content

All departments and organizations of the MEE (NNSA) shall carry out the following activities to ensure the effective implementation of safety review:

- Formulate and effectively implement the safety review program and working procedure for all types of nuclear facilities/activities, accept licensing applications, obtain required resources, conduct formal review for review materials, organize the implementation of technical reviews, and prepare corresponding review and licensing documents.
- Maintain open communication and dialogues with the reviewed party, clarify ambiguities, and respond to and solve the questions raised during the review. When necessary, field investigation, workshops, special research or independent review and calculation shall be carried out.
- Carry out business training on know-how and review techniques for safety

reviewers, so that they have the knowledge, experience and ability required for the areas under review, and evaluate their work performance on a regular basis.

- Supervise and control the review process and review quality, and perform periodical assessment for the independence and inspection quality of external technical support organizations and external experts.

(4) Standard safety review program

The headquarters of the MEE (NNSA) organizes the development of a standard safety review program for all kinds of nuclear facilities/nuclear technology utilization to provide technical guidance for safety review. The review program shall include as a minimum the following:

- Purpose and scope of application of safety review;
- Responsibility of safety review;
- Technical basis of safety review;
- Acceptance criteria of safety review;
- Steps and procedures of safety review;
- Organizational and technical interface of safety review;
- Records and reports of safety review results;
- Safety review conclusions, etc.

For the safety review of specific nuclear facilities/activities, the undertaker may carry out and detail the safety review according to the specific requirements of the facilities/activities on the basis of the standard safety review program.

(5) Categories of licensing items

A. Licensing items of nuclear facilities

According to the *Regulation of the People's Republic of China on the Supervision and Management for Civil Nuclear Installations*, the State implements a licensing system for civil nuclear facilities, including nuclear power plants, research reactors and critical assemblies, nuclear fuel cycle facilities and radioactive waste disposal facilities. The operators of nuclear facilities may carry out corresponding construction, operation and decommissioning activities only after obtaining relevant licenses or approval documents.

The types of licenses for NPPs include:

- Review Comments on NPP Siting;
- Construction License of NPP;
- Operating License of NPP;
- Approval for NPP Decommissioning;

- Operator license and senior operator license;
- Other documents requiring examination and approval, etc.

The types of safety licenses for research reactors, critical assemblies and other civil nuclear facilities are basically similar to those for nuclear power plants. The approval for renewal of operation licenses and the approval for beyond-design-lifetime operation licenses have been added to research reactors and critical assemblies.

B. Licensing items for nuclear technology utilization

According to the *Law of the People's Republic of China on the Prevention and Control of Radioactive Pollution* and the *Regulations on the Safety and Protection of Radioisotopes and Radiation-emitting devices*, organizations that produce, sell and use radioisotopes and radiation-emitting devices are required to provide relevant materials and apply for a license. The MEE (NNSA) basically adopts by equivalent IAEA's classification method of radioactive sources and establishes a safety regulation system for radioactive source radiation safety. Ecology and environment departments at all levels carry out two-level certification and four-level inspection on nuclear technology utilizers. Licenses for workplaces and organizations that produce radioisotopes (except for the preparation of PET radiopharmaceuticals for private use), sell and use Class-I radioactive sources (except for medical use), and sell (including fabricate) and use Class-I radiation-emitting devices and Class-A unsealed radioactive material shall be approved and issued by the MEE (NNSA), while licenses for other nuclear technology utilizers shall be approved and issued by the provincial ecology and environment departments.

C. Other licensing items

The licenses issued or approved by the MEE (NNSA) also include those for civil nuclear safety equipment design, manufacture, installation and NDT, qualification licenses for special technicians of civil nuclear safety equipment, licenses for civil nuclear material activities, licenses for radioactive solid waste treatment and storage and disposal, licenses for radioactive material transportation and licenses for transportation container design and manufacture, etc.

(6) Documents to be reviewed for nuclear facility license application

A. Documents to be reviewed for nuclear facility construction license application

- Application for the construction of nuclear facilities;
- Preliminary safety analysis report;
- EIA document;

- Quality assurance document;
- Other materials required by laws and administrative regulations.

B. Documents to be reviewed during the construction of nuclear facilities

- Revisions to important documents reviewed or approved by regulatory bodies;
- Modifications of the design important to safety;
- Report on major non-conformance items;
- Report on construction events;
- Waiver request;
- Other relevant documents required by NNSA.

Documents required for review of radioactive waste treatment, storage and disposal facilities during construction shall follow the same requirements.

C. Documents to be reviewed for nuclear facility operating license application:

- Application for nuclear facility operation;
- Final safety analysis report;
- Quality assurance document;
- Emergency plan;
- Other materials required by laws and administrative regulations.

D. Documents to be reviewed during the operation of nuclear facilities

- Revisions to important documents reviewed or approved by regulatory bodies;
- Application for modification of operating limits and conditions.
- Application for modification of items important to safety;
- Formulation and revision of regulations and procedures important to safety;
- Waiver request;
- Refueling program and its modification;
- First criticality application of the unit after refueling;
- Application for startup after accident shutdown;
- Non-irradiated and irradiated fuel storage scheme;
- Accident shutdown event report and disposal plan;
- Operational event announcement and report;
- Reloading report and its modification;
- Reloading safety evaluation report and its modification;
- Summary report on shutdown for reloading;
- Test, inspection and maintenance report;

- Summary report on physical test;
- Summary report on unit startup;
- Periodic safety review report;
- Other relevant documents required by NNSA.

Documents required for review of radioactive waste treatment, storage and disposal facilities during operation shall follow the same requirements.

E. Documents to be reviewed for application for operating license renewal of research reactors and critical assemblies:

- Periodic safety review report on nuclear facilities;
- Final safety analysis report on nuclear facilities (revised);
- Quality assurance program on nuclear facilities (operation phase) (revised);
- Other relevant documents required by NNSA.

F. Documents to be reviewed for application for operating license of research reactors and critical assemblies (beyond design lifetime):

- Report on demonstration of nuclear facilities operation safety (the report shall cover the contents of periodic safety review);
- Final safety analysis report on nuclear facilities (revised);
- Quality assurance program on nuclear facilities (extended operation phase) (revised);
- Other relevant documents required by NNSA.

G. Documents to be reviewed for nuclear facilities decommissioning licensing:

- Application for nuclear facilities decommissioning;
- Safety analysis report;
- EIA documents;
- Quality assurance documents;
- Other materials required by laws and administrative regulations.

(7) Conditions to be reviewed and confirmed for licensing of radioisotopes and radiation-emitting device activities

Organizations that produce, sell or use radioisotopes and radiation-emitting devices must apply for a radiation safety license. Prior to license applying, an EIA document shall be prepared and submitted to the corresponding environmental protection department for review and approval or for records.

The transfer, import and export of radioisotopes (radioactive sources and unsealed radioactive materials) shall be approved in advance and kept on record afterwards. The use of radioisotopes across provinces must be kept on record in

advance and canceled afterwards. Waste radioactive sources returned to the manufacturer or sent for storage shall be kept on record afterwards. Radioactive sources shall be managed by codes, which shall be allocated during their production or import. Codes shall correspond to radioactive sources one by one and accompany them for lifetime.

A. Organizations that produce, sell and use radioisotopes and radiation-emitting devices applying for a license

- There are specialized technical personnel with corresponding know-how, protection knowledge and health conditions that are commensurate with the capacity of production, sales and use activities they are engaged in;
- There are sites, facilities and equipment that meet the national environmental protection standards, occupational health standards and safety protection requirements;
- There are dedicated safety and protection management organizations or full-time and part-time safety and protection management personnel, and necessary protective equipment and monitoring instruments are in place;
- There are perfect safety and protection management rules and regulations as well as emergency measures for radiation accidents;
- There are handling capacity or practicable disposal schemes to ensure that the radioactive exhaust gas, liquid or solid waste meet the target-hitting discharge standards, if radioactive waste gas, waste liquid or solid waste is generated.

B. Radioisotopes importing organizations included in the catalogue of restricted imports and exports applying for a license.

- The organization has already obtained a license that is consistent with its activities;
- The organization has disposal schemes after the expiration of service life of imported radioisotopes, among which, the imported Class-I, Class-II and Class-III radioactive sources shall be attached with a commitment for recycling by the original exporter;
- Imported radioactive sources shall have mark numbers and necessary instructions. Among them, the mark numbers of Class-I, Class-II and Class-III radioactive sources shall be engraved on the radioactive source body or leak-tight cladding body, while the mark numbers of Class-IV and Class-V radioactive sources shall be indicated in the corresponding instructions.

- If the imported radioisotope is sold to other organizations for use, there shall be a written agreement signed with the user and a copy of the license obtained by this user.

C. Radioisotopes transferrer applying for a license

- The parties transferring out and receiving radioisotopes hold a license that is consistent with their activities;
- Receiving parties have disposal schemes after the expiration of the service life of radioisotopes;
- Both parties have already signed a written transfer agreement.

(8) Conditions to be reviewed and confirmed for radioactive materials transportation licensing

A. Design of radioactive material transportation container

- Design of Class-I radioactive material transportation container: It is necessary to review the general design drawing and its design specifications, design safety evaluation report and quality assurance program.
- Design of Class-II radioactive material transportation container: Prior to application for manufacture, the designer shall submit the general design drawing and its design specifications and design safety evaluation report to the nuclear safety regulation department under the State Council for records.
- Design of Class-III radioactive material transportation container: The designer shall prepare and arrange the certification documents that conform to the national radioactive material transportation safety standards, and keep them on record for future reference.

B. Manufacture of radioactive material transportation container

- Manufacture of Class-I radioactive material transportation container: The organizations concerned shall have specialized technical personnel commensurate with the manufacture activities they are engaged in, production conditions and testing methods matching up to the manufacture activities involved, as well as a sound management system and a perfect quality assurance system.
- If Class-I radioactive material transportation containers are fabricated by overseas organizations, it is necessary to review the following materials:
  a) A photocopy of the design approval file issued by the national nuclear safety regulation department where the designer is located;
  b) Design safety evaluation report;
  c) Certification materials for relevant performance of the manufacturer;

d) Quality conformity certificates;

e) Explanatory materials conforming to the laws and administrative regulations of the people's Republic of China and the national safety standards for the transportation of radioactive materials or the standards reviewed by the nuclear safety regulation department under the State Council.

C. Transportation of Class-I radioactive materials

- Review the nuclear and radiation safety analysis report on the transportation of radioactive materials, including the name, quantity, transportation container model, transportation mode, radiation protection measures, emergency measures, etc.

(9) Conditions to be reviewed and confirmed for the storage and disposal licensing of solid radioactive waste

A. Storage of solid radioactive waste

- There exists the legal person qualification;
- Organizational structure shall be such that it is capable of ensuring the safe operation of storage facilities and more than three specialized technical personnel in the areas of radioactive waste management, radiation protection and environmental monitoring, including one registered nuclear safety engineer as a minimum;
- There are facilities and sites for receiving and storing solid radioactive waste, as well as equipment for radioactive detection, radiation protection and environmental monitoring, which conforms to the relevant national standards for the prevention and control of radioactive contamination and the provisions of the environmental protection department under the State Council;
- There is a sound management system and a quality assurance system that meets the nuclear safety regulation requirements, including a quality assurance program, a storage facility operation monitoring plan, an radiation environmental monitoring plan and an emergency scheme.

B. Disposal of radioactive solid waste

- There exists the legal person status of a state-owned or state-holding enterprise.
- There shall be an organizational structure and specialized technical personnel capable of ensuring the safe operation of disposal facilities. Low- and medium- level solid radioactive waste disposal organizations shall have

more than 10 specialized technical personnel in radioactive waste management, radiation protection and environmental monitoring, including at least 3 registered nuclear safety engineers. For high-level solid radioactive waste and solid radioactive waste disposal organizations, there shall be more than 20 specialized technical personnel in radioactive waste management, radiation protection and environmental monitoring, 5 of who as a minimum shall be registered nuclear safety engineers.

- There are facilities and sites for receiving and disposing of solid radioactive waste, as well as equipment for radioactive detection, radiation protection and environmental monitoring, which conforms to the relevant national standards for the prevention and control of radioactive contamination and the provisions of the environmental protection department under the State Council. Low- and medium- level solid radioactive waste disposal facilities shall meet the safety isolation requirements of more than 300 years after closure. Deep geological disposal facilities for high-level solid radioactive waste and solid radioactive waste shall meet the safety isolation requirements of more than 10,000 years after closure.
- There is a corresponding amount of registered capital. Low- and medium-level solid radioactive waste disposal organizations shall have a registered capital of not less than 30 million Yuan. For high-level solid radioactive waste and solid radioactive waste disposal organizations, their registered capital shall not be less than 100 million Yuan.
- There is a financial guarantee to ensure the disposal activities will continue until the expiration of the institutional control period.
- There is a sound management system and a quality assurance system that meets the nuclear safety regulation requirements, including a quality assurance program, a disposal facility operation monitoring plan, an radiation environmental monitoring plan and an emergency scheme.

(10) Conditions to be reviewed and confirmed for civil nuclear safety equipment design, manufacture, installation and NDT licensing

- There exists the legal person qualification;
- There is at least 5-year work performance related to or similar to the activities to be carried out;
- There are specialized technical personnel who are qualified and suitable for the activities to be carried out. Among them, those involved in the welding and NDT activities of civil nuclear safety equipment shall obtain appropriate

qualification certificates;

- There are workplaces, facilities and equipment suitable for the activities to be carried out;
- There is a sound management system and a perfect quality assurance system as well as a quality assurance program that meets the nuclear safety regulation requirements.

(11) Level-to-level management of licensing approval

The classification management and level-to-level examination and approval are used for the administrative approval of nuclear and radiation safety regulation.

Category-A administrative approval (Ministerial Executive Meeting):

a) EIA (EIA) for the new siting of nuclear facilities (nuclear power, research reactors, spent fuel reprocessing facilities, high-, medium- and low-radioactive waste disposal facilities);
b) EIA for nuclear and radiation-related planning;
c) Projects deemed as necessary to be submitted to the Ministerial Executive Meeting for study and discussion after review by the Ministers Special Meeting.

Category-B administrative approval (Ministers Special Meeting):

a) EIA for the siting of the newly-built, renovation and expansion project at the same site of nuclear power plant and research reactor;
b) EIA for newly-built 1000 kV AC and above, 800 kV DC and above UHV transmission and transformation projects;
c) EIA for siting of newly-built uranium mining and milling project;
d) Projects deemed as necessary to be submitted to the Ministers Special Meeting for study and discussion after review in the Department Affairs Meeting.

Category-C administrative approval (Administrators Working Meeting):

a) EIA of the projects at the nuclear power plant construction and operation phases, relevant construction permits and operating licenses, and the approval for the initial fuel loading (the first unit covered in the final safety analysis report of the project);
b) EIA of the projects at the research reactor (critical assembly) construction and operation phases, relevant construction permits and operation licenses, and the approval for the initial fuel loading;
c) EIA of each phase and nuclear safety licensing of the nuclear fuel cycle project (except for EIA for the new siting of spent fuel reprocessing facilities

and EIA of each phase of the nuclear fuel cycle facility renovation and expansion project at the same site of spent fuel reprocessing facilities);

d) EIA of the newly-built, renovation and expansion project at the same site of the radioactive waste disposal facilities, EIA of the projects at the construction and operation phase, and relevant construction and operation licenses;
e) Examination and approval of high-level waste and spent fuel transportation projects;
f) First issuance of civil nuclear facility and equipment licenses;
g) Projects deemed as necessary to be submitted to the Administrators Working Meeting for study and discussion after review in the Department Affairs Meeting.

Category-D administrative approval (Department Affairs Meeting):

a) On-site emergency plans of nuclear facilities;
b) Radiation safety licenses;
c) Approval for the initial fuel loading of subsequent units of the nuclear power plant project in the same period;
d) EIA and nuclear safety licensing for each stage of the renovation and expansion project of nuclear fuel cycle facilities of the same site;
e) EIA and nuclear safety licensing for each stage of nuclear-related research projects;
f) EIA for top secret and non-nuclear projects of individual nuclear-related organizations;
g) Approval for the design and manufacture of radioactive material transportation container;
h) Relevant licenses stipulated in the regulations on the safety of radioactive waste management;
i) Other EIAs for uranium (thorium) mining and milling projects;
j) First registration of civil nuclear safety equipment of overseas organizations;
k) Nuclear reactor operator licenses;
l) Decommissioning approval, decommissioning EIA and final-state acceptance;
m) Projects deemed by the department director general as necessary to be studied and discussed in department affairs meetings.

Category-E administrative approval: other administrative approval items that require no deliberation in the meeting.

The general safety review and administrative approval process of the MEE (NNSA) is shown in Figure 5-7. Relevant management requirements are detailed in:

NNSA/HQ-00-SP-MP-002, *Guideline for Administrative Approval and Licensing Management of Nuclear and Radiation Safety*

NNSA/HQ-01-SP-PP-004, *Program for Standard Review of Nuclear Power Plant Safety Analysis Report*

NNSA/HQ-00-SP-PP-006, *Program for EIA Document Review of Nuclear Facilities*

NNSA/HQ-06-SP-PP-007, *Program for Licensing Review of Civil Nuclear Safety Equipment*

NNSA/HQ-03-SP-PP-009, *Program for Safety Review of Uranium Enrichment Facilities*

NNSA/HQ-03-SP-PP-011, *Program for Safety Review of Uranium Fuel Element Manufacture Facilities*

NNSA/HQ-03-SP-PP-013, *Program for Safety Review of Radioactive Waste Disposal Facilities*

NNSA/HQ-04-SP-PP-015, *Program for Safety Review of Radioactive Material Transport*

NNSA/HQ-07-SP-PP-017, *Program for Radiation Safety Review of Nuclear Technology Utilization Projects*

NNSA/HQ-08-SP-PP-019, *Program for Review of EIA Documents of Electromagnetic Construction Projects*

NNSA/HQ-08-SP-PP-021, *Program for Review of EIA Documents of Nuclear Facilities Utilization Projects*

NNSA/HQ-09-SP-PP-022, *Program for Review of EIA Documents of Uranium Mining and Milling*

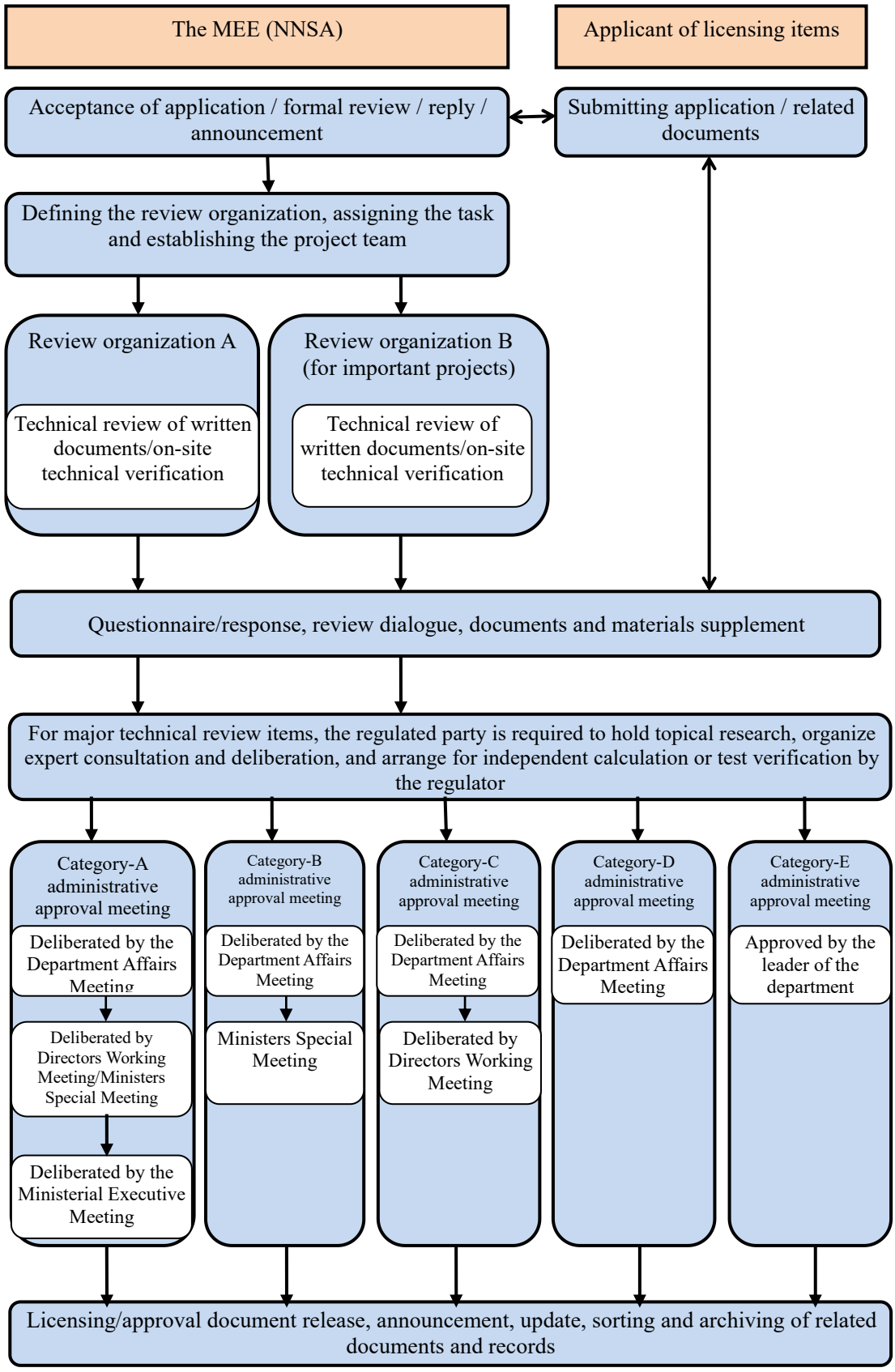


Figure 5-7 Administrative Approval Processes of the MEE (NNSA)

5.3.3 Nuclear and Radiation Safety Regulatory Inspection and Enforcement

(1) Work basis and assignment of responsibilities

According to the relevant nuclear safety laws and regulations and three stipulations (functional distribution, internal organization and staffing), the headquarters of the MEE (NNSA) and regional offices plan the nuclear facilities/activities under their responsibilities and organize the implementation of nuclear and radiation safety inspection and law enforcement. Departments I, II and III have the same assignment of responsibilities as described in Section 5.3.2.

Specifically, regional offices and local environmental protection departments are responsible for supervising various projects, subject to the guidance and supervision of the professional department. The Nuclear and Radiation Safety Center provides full technical support in various areas. For individual important inspection projects, both external technical support organizations and external technical experts may be commissioned to provide support.

(2) Purpose and scope of application

Supervising and inspecting the implementation of the nuclear and radiation safety management requirements and license conditions, the MEE (NNSA) judges the nuclear and radiation safety management capability of the regulated organizations and the safety performance of nuclear facilities or activities, and urges to correct what does not meet the nuclear and radiation safety management requirements and license conditions. Mandatory measures may be taken when necessary to ensure nuclear and radiation safety.

Safety inspection of nuclear facilities is applicable to all items and activities related to nuclear safety at each phase of manufacture, construction, operation and decommissioning. Safety inspection of nuclear technology utilization is applicable to all items and activities that affect the nuclear and radiation safety of the staff, public and environment. The scope of regulatory inspection is mainly that included in the conditions specified in the nuclear and radiation safety license, and that determined to be inspected in the licensing process. It is defined in the nuclear and radiation safety license and written documents during the process of nuclear and radiation safety administrative approval, regulatory inspection.

(3) Main work content

All departments and organizations of the MEE (NNSA) shall carry out the following activities to ensure the effective implementation of safety inspection:

- Formulate and effectively implement safety inspection programs, procedures

and inspection plans for various nuclear facilities/nuclear activities, organize the implementation of on-site inspection, and prepare corresponding inspection records and reports.

- The document on which the inspection is based consists of two parts. One is the general requirements, i.e. the provisions of relevant nuclear and radiation safety laws, administrative regulations, departmental rules, national standards, safety guidelines and other legislative documents. The second is characteristic requirements, i.e. the requirements directly related to the regulated organizations, for instance, those requirements on the application documents and relevant written commitments of the regulated organizations, nuclear and radiation safety management, etc.
- Report, assess and track problems identified in inspection until their effective solution. Make investigation and analysis for important non-conformances and events, and carry out topical research when necessary.
- Penalties imposed by China's nuclear and radiation safety laws and administrative regulations include warnings, fines or confiscation of illegal gains, improvement within a timeframe, suspension of work or operation for rectification, revocation of nuclear safety licenses, etc. Except for warnings, other penalties (including partial suspension of work) are mandatory.
- Formulate and effectively implement training programs for nuclear safety inspectors and radiation safety inspectors; select, train, assess, qualify and authorize nuclear and radiation safety inspectors, so that they have the knowledge, experience and competence for the supervised areas, and evaluate their working performance on a regular basis.
- Inspect and verify the inspection processes and inspection quality, and perform periodical assessment on the independence and inspection quality of external technical support organizations and external experts.
- Establish nuclear and radiation safety monitoring database and management system, to promote the application of IT technology, and carry out internal and external information exchange and experience feedback.

(4) Main modes of working

The MEE (NNSA) mainly adopts the following methods to perform nuclear and radiation safety inspection for nuclear facilities/activities:

A. Daily inspection

Daily inspections refer to daily activities by regional offices, including field

walk-downs, special subject investigations, management review of abnormalities or non-conformances, activity witness, periodic report review, and meeting attendance. For organizations involved in important nuclear facility or equipment activities, the daily inspection is mainly made by the site inspection team (member).

B. Routine inspection

Routine inspections refer to the regulatory inspection activities carried out in accordance with the established procedures for the inspection items already identified in the inspection program or the annual regulatory inspection plan. According to the implementation organizations of the regulatory inspection, they can be divided into the one organized by the MEE (NNSA) and the other ones organized by regional offices. According to the category of regulatory inspection activities, routine nuclear safety inspections include comprehensive inspection, control point inspection and special inspection.

C. Non-routine inspection

Non-routine inspections refer to the ones made by regulatory bodies based on the requirements, which respond to unexpected, unplanned or abnormal conditions or events.

Non-routine inspections may, or may not, be notified with an advance notification depending on the specific inspection project. The inspection with an advance notification may be implemented following the routine inspection procedures. For the inspection without advance notification, the way with no notification, no information, no report listening and no accompanying reception as well as direct to the grass-roots level and direct to the field may be used in order to obtain quick and accurate familiarization and understanding.

(5) Nuclear and radiation safety inspection program

Each professional department under the MEE (NNSA) organizes the formulation of standard inspection program for nuclear facilities/activities, including as a minimum:

- Purpose, basis and scope of regulatory inspection;
- Assignment of responsibilities and work interfaces for regulatory inspection;
- Main points and contents of regulatory inspection at different stages of nuclear facilities;
- Methods and steps of regulatory inspection;
- Acceptance criteria;
- Records and reports of regulatory inspection results;
- Response and disposal of emergencies;

- Conclusions of regulatory inspection, etc.

For the regulatory inspection of specific nuclear facilities/activities, the regional office may develop and detail the program according to the specific facility requirements on the basis of the standard inspection program. Detailed regulatory inspection implementation procedures shall be formulated for systems, equipment and activities important to safety.

(6) Enforcement actions with respect to license/licensee violations

There are corresponding enforcement provisions in nuclear safety laws and regulations. Formulate enforcement procedures, integrate and detail the enforcement requirements for various nuclear facilities/activities, and clarify the following requirements:

- Notification, identification and determination of violations;
- Initiation, implementation, tracking and verification of enforcement processes;
- Responsibilities and authority levels of site inspectors, regional offices and headquarters in enforcement;
- Response and disposal of emergencies;
- Communication and joint enforcement with other relevant government departments;
- Dispute settlement or legal arbitration under possible circumstances;
- Relevant legal aid and technical support;

Business training for law enforcement officials;

- Information collection, analysis and feedback on violations and enforcement actions.

The general nuclear and radiation safety inspection process of the MEE (NNSA) is shown in Figure 5-8.

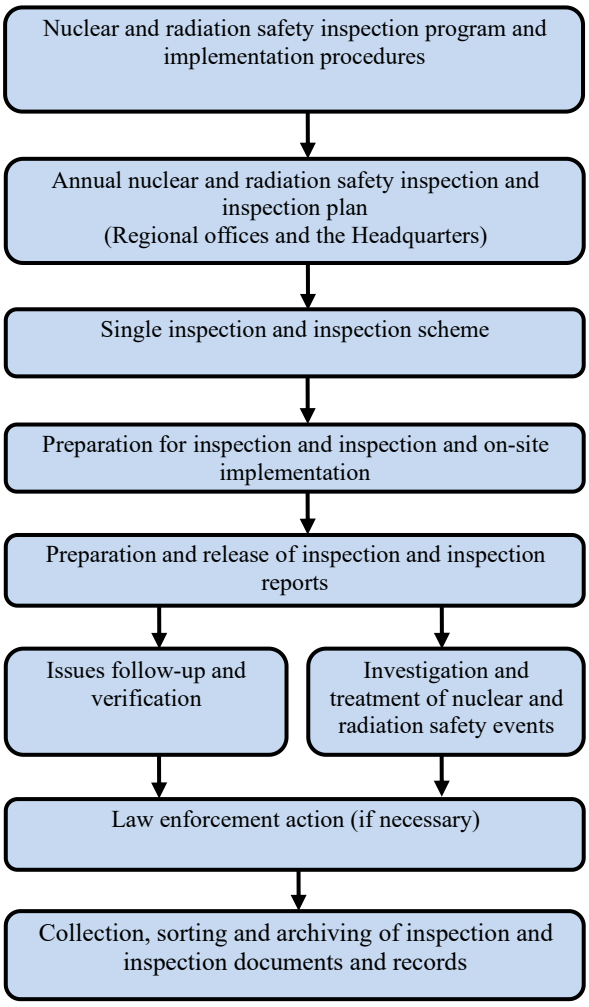


Figure 5-8 General Process of Nuclear and Radiation Safety Inspection of the MEE (NNSA)

(7) Nuclear facilities safety inspection

A. Management requirements and responsibilities

According to the *Regulations on the Safety Regulation for Civilian Nuclear Installations of the People's Republic of China*, the policy of Safety First should be followed in the siting, design, construction, operation and decommissioning of civil nuclear facilities; sufficient measures should be taken to ensure quality and safety operation, prevent nuclear accidents and minimize potential adverse impacts, and protect the staff, the public and the environment from excessive exposure and contamination beyond the national limits, that is, exposure and contamination should be reduced to an ALARA level (as low as reasonably achievable).

B. Nuclear safety regulatory inspection of nuclear facilities under construction

Main points of nuclear safety regulatory inspection include:

- Compliance of relevant nuclear safety regulations and guidelines on design/construction/commissioning, execution of license conditions and implementation of nuclear safety management requirements;
- Conformity and effectiveness of the implementation of design/construction/commissioning quality assurance programs;
- Experience feedback of design, construction and commissioning;
- Staffing, training, qualification assessment and authorization of safety/quality-related personnel;
- Suitability and conformity of technical standards and relevant technical documents;
- Implementation of design, construction, installation and commissioning activities important to safety;

Inspection, test, verification and acceptance of items or activities important to safety;

- Management and control of design and engineering changes important to safety;
- Investigation and disposal of construction events, non-conformances and major quality issues;
- Management and control of supervisors and important contractors/suppliers, etc.

C. Nuclear safety regulatory inspection of nuclear facilities under operation

Key items of nuclear safety regulatory inspection include:

- Compliance of relevant operation-related nuclear safety regulations, guidelines and license conditions;
- Conformity and effectiveness of the implementation of the operation quality assurance program;
- Nuclear safety culture construction and operational experience feedback and risk management;
- Staffing, training, qualification assessment and authorization of personnel important to safety;
- Suitability, conformity and effectiveness of various management programs and procedures;
- Implementation of activities important to safety, including operation, maintenance, periodic test, shutdown outage, power plant improvement, radiation protection, fire protection, physical safeguard, emergency preparedness and response, etc.;

- Monitoring of safety performance indicators and investigation and disposal of operational events;
- Management and control of important contractors, suppliers, technical support organizations, etc.

(8) Regulationof civil nuclear safety equipment

A. Management requirements and responsibilities

According to the requirements in the State Council Decree No. 500, the *Regulations on the Supervision and Management for Civil Nuclear Safety Equipment*, the Nuclear Safety Regulation Department under the State Council shall evaluate and verify the personnel, workplaces, facilities and equipment and quality assurance system of organizations involved in design, manufacture, installation, and NDT of civil nuclear safety equipment. Only when the requirements are satisfied can such organizations be allowed to carry out above-mentioned activities.

The MEE (NNSA) has established a Nuclear Safety Equipment Regulation Technology Center in the Nuclear and Radiation Safety Center. This technology center is specifically responsible for the technical review of licensing applications and the safety inspection of imported nuclear safety equipment, under the guidance and supervision of the professional department. The Northern China Regional Office performs daily inspection on civil nuclear safety equipment activities in the whole country, routine and non-routine nuclear safety inspections for the licensees and overseas registered organizations and on-site inspection of equipment important to nuclear safety. Daily inspection on field erection of civil nuclear safety equipment and inspection and testing of imported nuclear safety equipment shall be carried out by various regional offices.

B. Safety inspection of imported nuclear safety equipment

The MEE (NNSA) and its subordinated inspection agency conduct safety inspections on imported civil nuclear safety equipment in accordance with law. Safety inspection mainly includes port inspection and release review, inspection of unpacked declaration materials, unpacking regulatory inspection (unpacking witness inspection) as well as witness inspection (safety performance inspection) involving safety performance test at the installation and commissioning phase before fuel loading. Imported civil nuclear safety equipment that has not been subjected to safety inspection or that has failed safety inspection shall not be used for civil nuclear facilities in China. After passing the safety inspection, commodity inspection shall be done by the exit and entry inspection agency.

C. Regulatory inspection of nuclear safety equipment organizations and

activities

It includes comprehensive inspection, special inspection and checkpoint inspection. The key items of inspection are:

- Compliance of license conditions;
- Qualification of relevant personnel;
- Implementation of quality assurance program;
- Conformity of technical standards and relevant technical documents in use;
- Implementation of important processes of design, manufacture, installation or NDT of civil nuclear safety equipment;
- Investigation and disposal of major quality issues and implementation of rectification requirements;
- Acceptance and identification of design, manufacture, installation or NDT of civil nuclear safety equipment;
- Manufacturing supervision of operating organizations.

The process of regulation of civil nuclear safety equipment is shown in Figure 5-9.

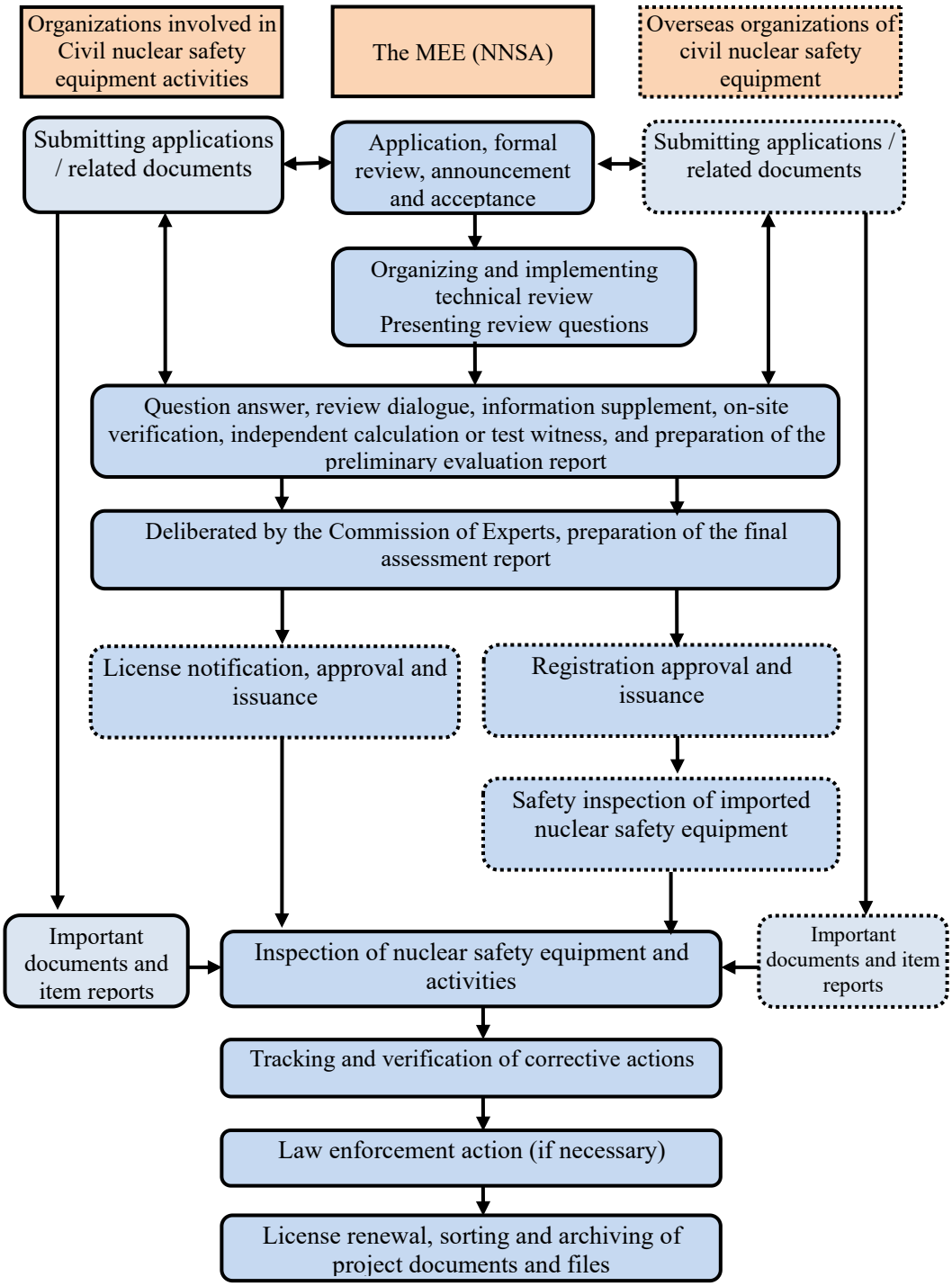


Figure 5-9 The Regulation Process of the MEE (NNSA) for Civil Nuclear Safety Equipment

(9) Safety regulation of radioisotopes and radiation-emitting devices

A. Level-to-level inspection principle

The MEE (NNSA) exercises unified inspection over the safety and protection of radioisotopes and radiation-emitting devices throughout the country. The competent environmental protection departments of the local people's governments at or above the county level exercise inspection and management over the safety and protection of radioisotopes and radiation-emitting devices within their respective administrative areas.

Ecology and environmental departments at all levels shall, in accordance with the principles of unified national inspection, local departments assuming their respective responsibilities, two-level certification, four-level inspection, direct national management of high risks, and low risks under the governance of local departments, local emergency prevails, level-to-level reporting response , etc., assume such responsibilities as radiation safety license issuance, EIA document approval, approval and records of radioisotope-related activities, inspection and management of radiation personnel training and personal dose monitoring, radiation accident emergency response and daily regulatory inspection.

B. Main contents of regulatory inspection

- Basic information of nuclear technology utilizers, for example, the use of radioisotopes and radiation-emitting devices, quantity of sale, full-life management and dynamic tracking of radioactive sources, etc.;
- Information on radiation safety and environmental protection management organizations or full-time personnel responsible for radiation safety and environmental protection management, etc.;
- Radiation safety and protection conditions of sites and facilities, including radiation shielding function, safety interlocking function, alarm devices, zoning management, warning signs, work signal indication, radiation monitoring of sites and surrounding environment, etc.;
- Personal safety and protection status, such as personnel qualification, training and personal dose monitoring, etc.;
- Security status of radioisotopes, including storage management, registration and inventory, etc.;
- Radiation safety management system and its implementation, including post responsibilities, operation procedures, equipment maintenance and repair system, instrument calibration, ledger management, archives management, radioactive waste management, radiation accident emergency management,

etc.;

- Implementation of national laws and regulations, such as EIA approval, as-built acceptance, approval and records of radioisotope-related activities, etc.;
- Rectification implementation of inspection comments by the regulatory authorities.

C. Regulatory inspection by regional offices and local ecology and environment departments

Regional offices shall, in accordance with the inspection program and technical procedure for regulatory inspection, supervise and inspect the licensees. The provincial ecology and environment departments may follow the same practice. Based on this, they may develop and detail regulatory inspection in consideration of nuclear technology utilization organizations under their jurisdictions, and formulate their respective inspection programs and technical procedures. Regional offices supervise the performance of local ecology and environment departments.

(10) Control of nuclear materials and regulation of radioactive material transportation

According to the *Regulations on Nuclear Materials Control of the People's Republic of China* and the *Regulations on the Management of Transport Safety of Radioactive Articles*, the MEE (NNSA) is responsible for the control and safety inspection of physical protection of civil nuclear materials and the nuclear and radiation safety regulation of radioactive material transportation throughout the country, to ensure the safe and legal use of nuclear materials, to prevent theft, damage, loss, illegal transfer and use and protect the safety of the state and the people, protect the environment and promote the development and utilization of nuclear energy and technology.

Department of Nuclear Facility Safety Regulation and Department of Radiation Source Safety Regulation of the MEE (NNSA) are respectively responsible for organizing the formulation of the inspection program for nuclear material management and radioactive material transportation standards. The framework structure of this program is similar to that of nuclear facilities. Inspection points and main contents are based on the characteristics and regulatory requirements of nuclear material management and radioactive material transportation, mainly including:

- Operation of quality assurance system of the organization designing, fabricating and using radioactive material transportation containers;
- Control verification of design, manufacture and transportation processes;

- Safety analysis of transportation processes;
- Online monitoring and control;
- Radiation level and personal dose monitoring;
- Radiation protection and safety measures;
- Emergency preparedness and response for nuclear and radiation accidents;
- Education and training on safety and protection of the staff, etc.

(11) Inspection and management of radioactive waste management

A. Management requirements and responsibilities

According to the *Regulations of the People's Republic of China on Radioactive Waste Management*, China implements a safety licensing system, regulatory inspection system, reporting system, EIA system, emission licensing system and effluent and environmental monitoring system for radioactive waste management. The MEE (NNSA) is responsible for the safety regulation of radioactive waste throughout the country. Local competent ecology and environment departments at or above the county level and other departments concerned are responsible for the relevant management of radioactive waste in their respective administrative areas.

China's radioactive waste mainly comes from nuclear power plants, research reactors and critical assemblies, nuclear fuel cycle facilities, nuclear technology utilization and the development and utilization of uranium (thorium) mineral resources. The MEE (NNSA) has stipulated corresponding management requirements and regulatory measures for different levels of radioactive waste, and has established a national radioactive waste management information system jointly with other government departments for information sharing.

B. Main contents of radioactive waste regulatory inspection

The MEE (NNSA) is responsible for organizing the formulation of the inspection program for radioactive waste management standards. The framework structure of this program is similar to that of nuclear facilities. Key inspection items include:

- Operation of radioactive waste management rules and regulations and quality assurance system;
- Classification management of radioactive waste;
- Status of radioactive waste storage and radiation monitoring facilities and equipment;
- Establishment and implementation of facility operation plan and radiation environmental monitoring plan;
- Radiation protection and health management of personnel;

- Emission control of radioactive waste gas and liquid;
- Emergency preparedness and response for radiation accidents;
- Staffing, training and qualification management of specialized technical personnel;
- Management and control of the siting, construction, operation and closure of radioactive waste disposal facilities at various phases.

(12) Inspection and management of uranium mining and milling and associated radioactive mineral radiation environmental

Department of Radiation Source Safety Regulation of the MEE (NNSA) is responsible for organizing the formulation of the inspection program for uranium mining and milling standards. The framework structure of this program is similar to that of nuclear facilities. Key inspection items include:

- Operation of uranium mining and milling rules and regulations and quality assurance system;
- Approval of EIA documents and implementation of three-simultaneity system (i.e., the pollution prevention facilities shall be designed, constructed and put into operation simultaneously with the main project);
- Status of radiation monitoring, protection facilities and equipment and pollution prevention facilities;
- Wastewater treatment and discharge control;
- Control of solid radioactive waste generation;
- Environmental management of tailings impoundment;
- Radiation monitoring and evaluation of effluent and surrounding environment;
- Emergency preparedness and response for radiation accidents;
- Decommissioning plan and treatment of uranium mining and milling, etc.

For more information on the management requirements on nuclear and radiation safety inspection and law enforcement, please find in:

NNSA/HQ-00-JD-MP-001, *Guideline for Nuclear and Radiation Safety regulatory inspection*

NNSA/HQ-01-JD-PP-001, *Inspection program for Nuclear Power Plant Construction Phase*

NNSA/HQ-01-JD-PP-002, *Inspection program for Nuclear Power Plant Commissioning Phase*

NNSA/HQ-01-JD-PP-003, *Inspection program for Nuclear Power Plant Operation Phase*

NNSA/HQ-02-JD-PP-005, *Nuclear Safety Inspection program for Research Reactors (Operation Phase)*

NNSA/HQ-06-JD-PP-008, *Inspection program for Civil Nuclear Safety Equipment*

NNSA/HQ-03-JD-PP-010, *Inspection program for Nuclear Fuel Cycle Facilities*

NNSA/HQ-04-JD-PP-014, *Inspection program for Radioactive Waste Disposal Facilities*

NNSA/HQ-07-JD-PP-016, *Inspection program for Radioactive Waste Transportation*

NNSA/HQ-10-JD-PP-019, *Inspection Program for Environmental Protection of Electromagnetic Construction Projects*

NNSA/HQ-08-JD-PP-020, *Inspection Program for Radiation Safety and Protection in Nuclear Technology Utilization*

NNSA/HQ-09-JD-PP-023, *Safety Inspection Program for Radiation environmental in Uranium Mining and Milling*

5.3.4 EIA Review for Nuclear and Radiation Construction Projects

(1) Management requirements and assignment of responsibilities

According to the *Law of the People's Republic of China on EIA*, the environmental impact that may arise from the implementation of planning and construction projects shall be analyzed, anticipated and evaluated, countermeasures and actions to prevent or mitigate adverse environmental impacts shall be proposed, and methods and systems for tracking and monitoring shall be adopted. EIA must be objective, open and fair, comprehensively considering the possible impacts of planning or construction projects on various environmental factors and the ecosystems they constitute, so as to provide scientific basis for decision-making.

The nuclear facility operators or nuclear technology utilizers are responsible for preparing EIA documents, which shall be submitted to the MEE (NNSA) for review and approval, and shall be publicized for public comments and suggestions. Only after approval can the relevant license documents be issued. MEE (NNSA), in conjunction with relevant departments of the State Council, shall organize the establishment and improvement of the basic database of EIA and evaluation indicator system.

Various professional departments of the MEE (NNSA) are responsible for EIA review of the utilization of nuclear facilities and technology within their respective regulation areas. Technical support organizations, including the Nuclear and Radiation Safety Center, shall undertake the technical review of EIA documents, under the

guidance and inspection of the Professional department.

(2) Main work content

All departments and organizations of the MEE (NNSA) shall carry out the following activities to ensure the effective implementation of EIA review:

- Formulate and effectively implement the standard EIA review program and working procedure for various nuclear facilities/activities, accept review applications, obtain required resources and review materials, organize the implementation of technical reviews, and prepare corresponding review documents.
- Main contents of the technical review include:
  a) Control indicators;
  b) Evaluation of nuclide;
  c) Scope of evaluation;
  d) Waste management and source item analysis;
  e) Investigation and analysis of radiation environmental quality;
  f) Radiation environmental impact analysis;
  g) Radiation environmental management and radiation monitoring;
  h) Existing problems and suggestions for improvement measures, etc.
- Maintain open communication and dialogues with the reviewed party, clarify ambiguities, and respond to and solve the questions raised during the review. When necessary, field investigation, topical research or independent review and calculation shall be carried out.
- Carry out business training on know-how and review techniques for EIA reviewers, so that they have the knowledge, experience and ability required for the areas under review, and evaluate their work performance on a regular basis.
- Supervise and control the EIA review process and quality, and perform assessments for the qualification and review quality of external technical support organizations.
- Establish an EIA review database and management system, to promote the application of IT technology, and carry out internal and external information exchange and experience feedback.

(3) Standard review program of EIA documents

The headquarters of the MEE (NNSA) organized the development of a standard EIA review program for nuclear facilities/nuclear technology utilization to provide guidance for technical review. The review program shall include as a minimum the

following:

- Review purpose and scope of application;
- Responsibility for review;
- Technical basis of review;
- Acceptance criteria for review;
- Review procedures;
- Organizational and technical interface of review;
- Records and reports of review results;
- Review conclusions, etc.

(4) Classification management of EIA

According to the degree of impact of construction projects on the environment, the state implements classification management of its EIA:

- If the project is likely to cause significant environmental impacts, an environmental impact statement shall be prepared to make a comprehensive evaluation on the resulting environmental impact;
- If the project is likely to cause slight environmental impacts, an environmental impact report form shall be prepared to analyze or specifically evaluate the resulting environmental impacts;
- If the project has little impacts on environment and no EIA is required, complete the environmental impact registration form.

The EIA classification management catalogue for construction projects shall be formulated and published by the competent administrative environmental protection department under the State Council.

(5) EIA of uranium mining and milling and associated radioactive mineral development and utilization organizations

According to the provisions in the *Law of the People's Republic of China on the Prevention and Control of Radioactive Pollution*, organizations that develop, utilize or close uranium (thorium) mines shall prepare an environmental impact statement before applying for a mining license or going through formalities for approval of the commence of decommissioning, which then shall be submitted to the competent administrative environmental protection department under the State Council for approval. Organizations that develop and utilize associated radioactive minerals shall prepare an environmental impact statement before applying for a mining license and submit it to the competent administrative environmental protection department of the people's government at or above the provincial level for review and approval. For mineral resources development and utilization projects that have been included in the

Catalogue of Regulation of Radiation Environmental for Development and Utilization of Mineral Resources (First Batch), and in which the single uranium (thorium) nuclide content in raw ores, intermediate products, tailings (slag) or other residues exceeds 1 Becquerel/g (1Bq/g), the construction organization shall entrust an EIA institution with the business scope of nuclear industry assessment to prepare a special file on radiation environmental impact assessment and a special file on radiation environmental as-built acceptance. The special file on radiation environmental impact assessment shall be included in the EIA document, established simultaneously with the EIA document of the project, and submitted together. The assessment category shall follow the *Catalogue of Classification Management for EIA of Construction Projects*.

(6) EIA of Nuclear facility operators

According to the provisions in the *Law of the People's Republic of China on the Prevention and Control of Radioactive Pollution*, nuclear facility operators shall prepare an environmental impact statement and submit it to the MEE (NNSA) for review and approval before going through formalities for approval of nuclear facility siting, as well as before applying for and obtaining nuclear facility construction and operation licenses and going through the procedures for approval of decommissioning. Without approval, the relevant department shall not issue licenses or handle approval documents.

(7) EIA of Nuclear Technology Utilization Organizations

According to the provisions in the *Law of the People's Republic of China on the Prevention and Control of Radioactive Pollution*, organizations that produce, sell and use radioisotopes and accelerators, neutron generators and radiation-emitting devices containing radioactive sources shall prepare an EIA statement and submit it for review and approval to the competent administrative environmental protection departments of the people's governments in provinces, autonomous regions and municipalities directly under the Central Government before applying for a license. Without approval, the relevant department shall not issue licenses.

Classification and level-to-level management is required for nuclear technology utilization according to the *Catalogue of Classification Management for EIA of Construction Project*. In terms of nuclear technology utilization and construction projects (excluding the nuclides or radiation-emitting devices added at the licensed sites that do not exceed the types of licensed activities and are not higher than the level of the licensed scope):

- For projects that production of radioisotopes (except for the preparation of

radiopharmaceuticals for PET); use of Class I radioactive sources (except for medical use); sale (including construction) and use of Class I radiation-emitting devices workplaces of Class-A unsealed radioactive materials; environmental impact statements must be prepared;

- For projects that preparation of radiopharmaceuticals for PET; medical use of Class I radioactive sources; use of Class II/III radioactive sources; production and use of Class II radiation-emitting devices; workplaces of Class-B/C with unsealed radioactive materials (except for radioactive particle sources for implantation therapy by medical institutions); radiolabelled experiment conducted for in the field, environmental impact report forms must be prepared for projects;
- For projects that sale of Class I/II/III/IV/V radioactive sources; use of Class IV/V radioactive sources; use of radioactive particle sources for implantation therapy by medical institutions; sale of unsealed radioactive materials; sale of Class-II radiation-emitting devices. product, sold, use of Class-III radiation-emitting devices, the environmental impact registration form must be completed.

In terms of the decommissioning of nuclear technology application projects:

- For decommissioning of projects that production of radioisotopes (except for the preparation of radiopharmaceuticals for PET) ; workplaces of Class-A with unsealed radioactive materials, environmental impact statements must be prepared;
- For decommissioning projects that preparation of radiopharmaceuticals for PET; workplaces of Class-B with unsealed radioactive materials; water well-type gamma irradiation-emitting devices; places where Class I/II/III radioactive sources other than water well-type gamma irradiation-emitting devices are used and contamination exists; use of Class I/II irradiation-emitting devices and contamination exists, environmental impact report forms must be prepared;
- For projects that workplaces of Class-C with unsealed radioactive materials; use of class I/II/III radioactive sources other than water well-type gamma irradiation-emitting devices and contamination does not exist. Environmental impact report forms must be prepared.

The general review process for EIA of nuclear and radiation safety construction projects of the MEE (NNSA) is shown in Figure 5-10. For more information on relevant management requirements, see NNSA/HQ-00-SP-MP-002, *Guideline for*

Administrative Approval and Licensing Management of Nuclear and Radiation Safety.

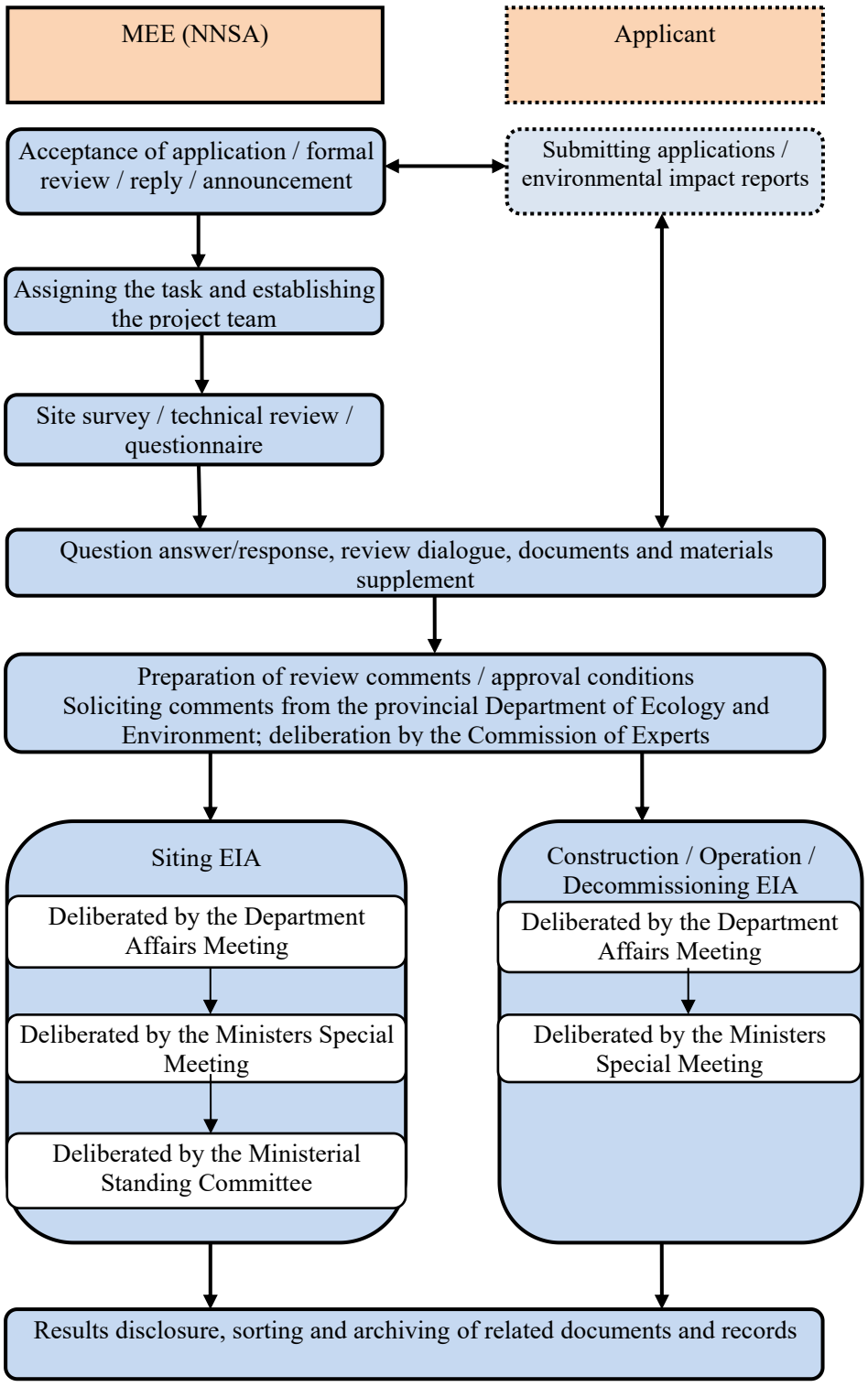


Figure 5-10 General Review Process for EIA of Nuclear and Radiation Safety Construction Projects

5.3.5 Nuclear and Radiation Accident Emergency and Radiation Radiation Environmental Monitoring

(1) Management requirements and assignment of responsibilities

According to the *Law of the People's Republic of China on the Prevention and Control of Radioactive Pollution*, the *Law of the People's Republic of China on Emergency Response*, the *Emergency Management Regulations of Nuclear Accidents at Nuclear Power Plants*, the *Regulations on the Safety and Protection of Radioisotopes and Radiation-emitting Devices* and other laws and regulations, the MEE (NNSA) is responsible for supervising the emergency preparedness and response of nuclear facilities and radioactive sources (including Class I radioactive sources) that cause major or extraordinarily major radiation accidents, review and approval of emergency plans/contingency plans of nuclear facility operators, nuclear and radiation emergency response and accident investigation and disposal, etc.

According to the provisions in the *Law of the People's Republic of China on the Prevention and Control of Radioactive Pollution*, the state establishes a radioactive contamination monitoring system. The competent administrative environmental protection department under the State Council, in conjunction with other relevant departments under the State Council, organizes an environmental monitoring network to monitor and manage radioactive contamination in real time. The MEE (NNSA) is responsible for the unified regulation of the radiation environmental monitoring in the whole country. In conjunction with other relevant departments under the State Council, it establishes an environmental monitoring network. According to the assignment of responsibilities, it organizes the radiation environmental monitoring and regulatory monitoring of nuclear facilities and key radiation sources, organizes the inspection of the radiation environmental management by local ecology and environment departments, and monitors the effluents of other nuclear facilities as required.

Department of Nuclear Facility Safety Regulation of the MEE (NNSA) is the centralized management department for this element. The regional offices are specifically responsible for the radiation environmental management of nuclear facilities, the daily inspection of nuclear and radiation emergency preparedness and the inspection of emergency response on accident sites. The MEE (NNSA) has established a Nuclear and Radiation Emergency Technology Center in the Nuclear and Radiation Safety Center, which is fully responsible for the daily preparation and emergency response of nuclear and radiation emergencies and other technical supports.

(2) Emergency plans for nuclear and radiation accidents

A three-level emergency organization system has been formed for nuclear accident emergency in China, which consists of nuclear accident emergency organizations of the state, those of the Provinces (autonomous regions and municipalities) where the nuclear facilities are located and those of nuclear facility operators. The National Nuclear Accident Emergency Coordination Committee takes the lead in organizing the formulation and implementation of the national nuclear accident emergency plan. The MEE (NNSA) is a member of this committee. The provincial government where the nuclear facilities are located is responsible for organizing the formulation and implementation of off-site emergency plans and submitting them to this Committee for approval. The nuclear facility operator is responsible for formulating and implementing the on-site emergency plans, and submitting them to the MEE (NNSA) for approval.

The MEE (NNSA) is responsible for organizing the formulation and implementation of the national radiation accident emergency plan, as well as investigation and disposal of major radiation emergency response and accidents. The provincial radiation accident emergency plan is formulated and implemented by the provincial and municipal ecology and environment departments. The MEE (NNSA) organizes the formulation and implementation of the MEE *(NNSA) Emergency Plan for Nuclear Accidents* and *the MEE (NNSA) Emergency Plan for Radiation Accidents* in accordance with its responsibilities. Emergency plans/contingency plans at all levels shall be prepared, approved and revised on a regular basis as required.

(3) Main work content

All departments and organizations of the MEE (NNSA) shall carry out the following activities to ensure the effective implementation of nuclear and radiation accident emergency:

- Formulate and effectively implement MEE (NNSA)'s nuclear and radiation emergency plan, environmental monitoring program, management procedures and implementation procedures;
- Review the on-site emergency plans of nuclear facility operators and supervise their implementation;
- Prepare accident emergency and radiation environmental monitoring training materials, and conduct periodic emergency personnel trainings;
- Manage and maintain basic installations at the emergency hall and monitoring laboratory, including facilities, equipment, etc.;
- Develop and maintain emergency and monitoring related information platforms, databases and analysis software;

- Organize and carry out emergency drills on nuclear and radiation accidents on a regular basis;
- Liaison and information exchange with the National Nuclear Emergency Coordination Committee, relevant ministries and local environmental protection departments;
- Temporary control of nuclear facilities/installations in case of environmental emergencies;
- Daily management, preparation and on-duty of nuclear and radiation accident emergency;
- Collection, sorting and retention of relevant documents, materials and records;
- Release of nuclear and radiation accident emergency and radiation environmental monitoring information.

The MEE (NNSA) nuclear and radiation accident emergency organization system is shown in Figure 5-11.

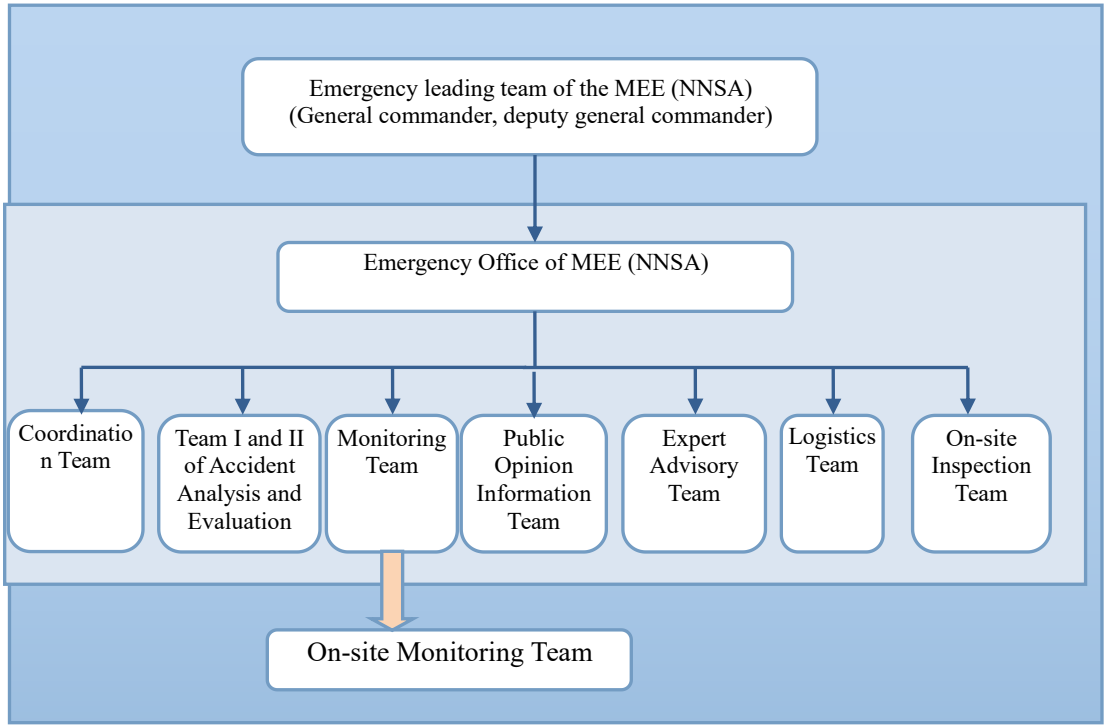


Figure 5-11 The MEE (NNSA) Nuclear and Radiation Accident Emergency Organization System

(4) Radiation environmental monitoring network

China's radiation environmental monitoring includes regional radiation environmental quality monitoring of China's land and territorial waters, regulatory monitoring of radiation environmental surrounding ionization or electromagnetic radiation facilities, and early warning monitoring and emergency monitoring of accidents (events) of nuclear and radiation facilities. The competent ecology and environment departments of 31 provinces (municipalities and autonomous regions) participate in and are responsible for the radiation environmental monitoring within their respective jurisdictions. The radiation environmental monitoring network structure is shown in Figure 5-12.

A. Radiation environmental quality monitoring

The national control points for radiation environmental quality monitoring in the national radiation environmental monitoring network basically cover all municipalities directly under the Central Government, provincial capitals, major rivers, major lakes, major international rivers and offshore waters and other important environment-sensitive points in mainland China (excluding Taiwan Province). The monitoring objects cover air, water, soil, biological and other environmental media. The data of radiation environmental quality are mainly obtained through monitoring of national control points for development and publication of the annual report on

radiation environmental quality nationwide. Main conclusions are released through the national environmental status bulletin and the official website of MEE (NNSA).

B. Regulatory monitoring of radiation environmental

The National Radiation Environmental Monitoring Network undertakes the regulatory monitoring of the radiation environmental around nuclear power plants and nuclear and radiation facilities. The MEE (NNSA) has installed multiple monitoring points and environmental safety warning monitoring points for the five types of nuclear and radiation facilities under the State's key inspection. The radiation environmental monitoring system has been arranged around nuclear power plants and other important nuclear facilities to monitor changes in their radiation environmental in real time. According to the source items, plane layout, meteorology and hydrology of each monitoring point, the surrounding natural environment conditions and the distribution of sensitive points, a regulatory monitoring plan for radiation environmental shall be formulated in accordance with the requirements of the *National Radiation Environmental Monitoring Plan (Interim)* and the *Technical Specifications for Radiation Environmental Monitoring*.

C. Emergency monitoring

In case of nuclear accident emergency, the radiation environmental monitoring shall be performed mainly by the nuclear facility operators and local nuclear and radiation environmental monitoring departments, led and coordinated by the off-site Emergency Responses Committee (the local provincial government) to enable the resources and activities of all related parties are coordinated efficiently for unified action. The MEE (NNSA) Nuclear and Radiation Accident Emergency Technology Center and Radiation Environmental Monitoring Technology Center provide comprehensive technical support.

At the early phase of nuclear accident, nuclear and radiation surrounding the site is monitored mainly by relying on the emergency nuclear and radiation monitoring source and workforce on the site of the NPP operators. At the later phase, nuclear and radiation are monitored mainly by relying on off-site monitoring source and forces due to the possible recovery activities in a large area. At the middle phase of an accident, environmental monitoring is performed by both on-site and off-site parties.

D. Occupational exposure monitoring

Occupational exposure monitoring is to measure the radiation exposure of occupational workers in their work duties, focusing on personal dose monitoring. If personal dose monitoring is not feasible, the occupational exposure of the staff can be evaluated according to the workplace monitoring results and the exposure location

and time data after approval by the review and management department, so as to maintain a comprehensive picture of the radiation exposure to the staff and provide technical support for effective improvement and optimization of radiation protection.

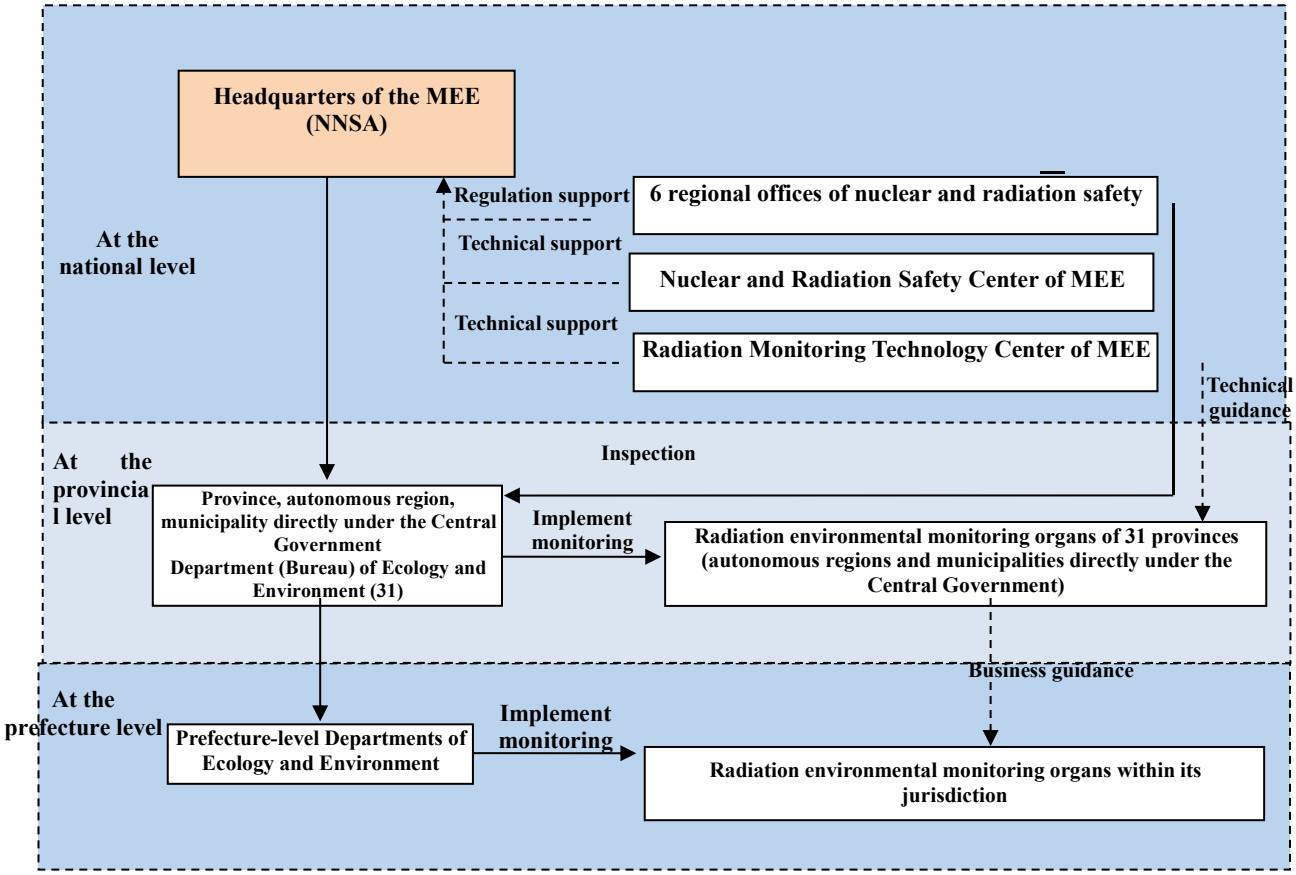


Figure 5-12 Radiation environmental Monitoring Network

For management requirements on nuclear and radiation accident emergency response and radiation environmental impact monitoring, see the following documents and their implementation procedures:

NNSA/HQ-00-YJ-MP-009, *Nuclear Accident Emergency Plan*

NNSA/HQ-00-YJ-MP-010, *Radiation Accident Emergency Plan*

NNSA/HQ-00-JC-MP-006, *Guideline for National Radiation Monitoring*

5.3.6 Qualification and Certification Management

(1) Management requirements and assignment of responsibilities

According to the requirements of relevant national laws and regulations on nuclear and radiation safety, the MEE (NNSA) is responsible for the qualification management of personnel involved in posts important to nuclear and radiation safety, mainly including:

- Registered nuclear safety engineer;
- Nuclear safety inspector;
- Radiation safety inspector;
- Reactor operator/senior reactor operator;
- Welder and Welding operator;
- NDT personnel, etc.

The above-mentioned important posts cover the qualification requirements not only for personnel engaged in nuclear and radiation safety regulation, but also for the personnel of the licensees in positions important to safety. Standardizing personnel selection, training, assessment and qualification management mechanisms, personnel in posts important to nuclear and radiation safety will have and continue to maintain the necessary nuclear safety cultural attainments and adequate know-how, skills and experience.

Department of Nuclear Facility Safety Regulation of the MEE (NNSA) is responsible for the centralized qualification management of employees in posts important to nuclear and radiation safety, and the Nuclear and Radiation Safety Center is responsible for relevant technical support.

(2) Main work content

All departments and organizations of the MEE (NNSA) shall carry out the following activities to ensure the effective qualification management of employees important to nuclear and radiation safety:

- Formulate and effectively implement training and assessment programs, procedures and training plans for personnel in various posts important to safety, and organize personnel training, assessment, certification granting, qualification management and retraining on a regular and zoning basis.
- Select and recruit qualified experienced trainers in the industry, develop necessary training materials and examination question bank, establish clear requirements for training institutions and conduct qualification examination, supervise and evaluate the training process and training effect.
- Establish a database, management system and work platform for personnel in posts important to safety, to promote the application of IT technology, and carry out internal and external information exchange and experience feedback and continuously improve training.

(3) Registered nuclear safety engineer

According to the requirements of the *Interim Provisions on the Vocational Qualification System for Registered Nuclear Safety Engineers*, in order to improve the

quality of specialized nuclear safety technical personnel and standardize the management of key posts in nuclear safety, the vocational qualification system is adopted for specialized technical personnel engaged in key positions of nuclear safety in organizations that apply nuclear energy and technology and provide technical services for nuclear safety. The MEE (NNSA) has organized and formulated the examination syllabus for registered nuclear safety engineers according to the requirements of documents and practical operation needs, and organized national universal examinations on a regular basis.

Personnel with corresponding educational background and engaged in nuclear and radiation safety-related posts for a specified number of years may apply for the examination after passing the qualification examination. After passing the examination, they will obtain a vocational qualification certificate for registered nuclear safety engineer. Only after registration, can they practice as a registered nuclear safety engineer and receive periodic continuing education. The scope of practicing of registered nuclear safety engineers includes: nuclear safety review, nuclear safety inspection, nuclear power plant manipulation and operation, nuclear quality assurance, radiation protection, radiation environmental monitoring and other areas closely related to nuclear safety as specified by the MEE (NNSA).

(4) Nuclear safety inspector

According to the *Regulations on the Safety Regulation for Civilian Nuclear Installations of the People's Republic of China* and its detailed rules of implementation and the requirements of the *Certificate Management Measures for Nuclear and Radiation Safety Inspectors*, nuclear safety inspectors shall meet certain conditions, including educational background, work experience, competence and basic professional qualities, etc., to ensure the quality of nuclear safety inspection. In accordance with laws and regulations and work needs, the MEE (NNSA) prepares the teaching program for nuclear safety inspectors and the requirements for the management of nuclear safety inspector certificates, so as to conduct personnel selection, training and assessment.

Only when personnel are subject to the initial training organized by the MEE (NNSA) and pass the assessment, and then participate in the intermediate or advanced training on nuclear and radiation safety regulation organized by this ministry and pass the assessment or obtain the vocational qualification for registered nuclear safety engineers, can the nuclear safety inspector certificate be granted for them by MEE (NNSA). The certificate holder shall engage in nuclear safety regulatory inspection according to the roles and responsibilities, area coverage and validity specified in the

certificate, and shall be entitled to corresponding rights and obligations.

(5) Radiation safety inspector

According to the *Regulations on the Safety and Protection of Radioisotopes and Radiological Devices* and the *Certificate Management Measures for Nuclear and Radiation Safety Inspectors*, the competent administrative environment protection departments at or above the county level shall be staffed with specialized radiation safety inspectors, who are engaged in and proficient in radiation protection. Such inspectors shall be subjected to periodic professional knowledge training and assessment organized by the administrative environmental protection department under the people's government at or above the provincial level.

The MEE (NNSA) prepares a unified training program for nuclear and radiation safety inspectors. Only when personnel from the MEE (NNSA) and its regional offices are subject to the initial training organized by the MEE (NNSA) and pass the assessment, and then participate in the intermediate or advanced training on nuclear and radiation safety regulation organized by this ministry and pass the assessment or obtain the vocational qualification for registered nuclear safety engineers, can the certificate of radiation safety inspectors be granted for them by MEE (NNSA).

Only when provincial radiation safety inspectors are subject to the primary or advanced provincial radiation safety regulation training organized by the MEE (NNSA) and pass the assessment or obtain the vocational qualification for registered nuclear safety engineers, can the certificate of radiation safety inspectors be granted for them by MEE (NNSA). For radiation safety inspectors below the provincial level, they shall be subject to the training organized by the provincial environmental protection department and pass the assessment, and are granted a radiation safety inspector certificate by such department. The certificate holder shall engage in radiation safety inspection according to the roles and responsibilities, area coverage and validity specified in the certificate, and shall be entitled to corresponding rights and obligations.

The process of qualification management for nuclear and radiation safety inspectors is shown in Figure 5-13.

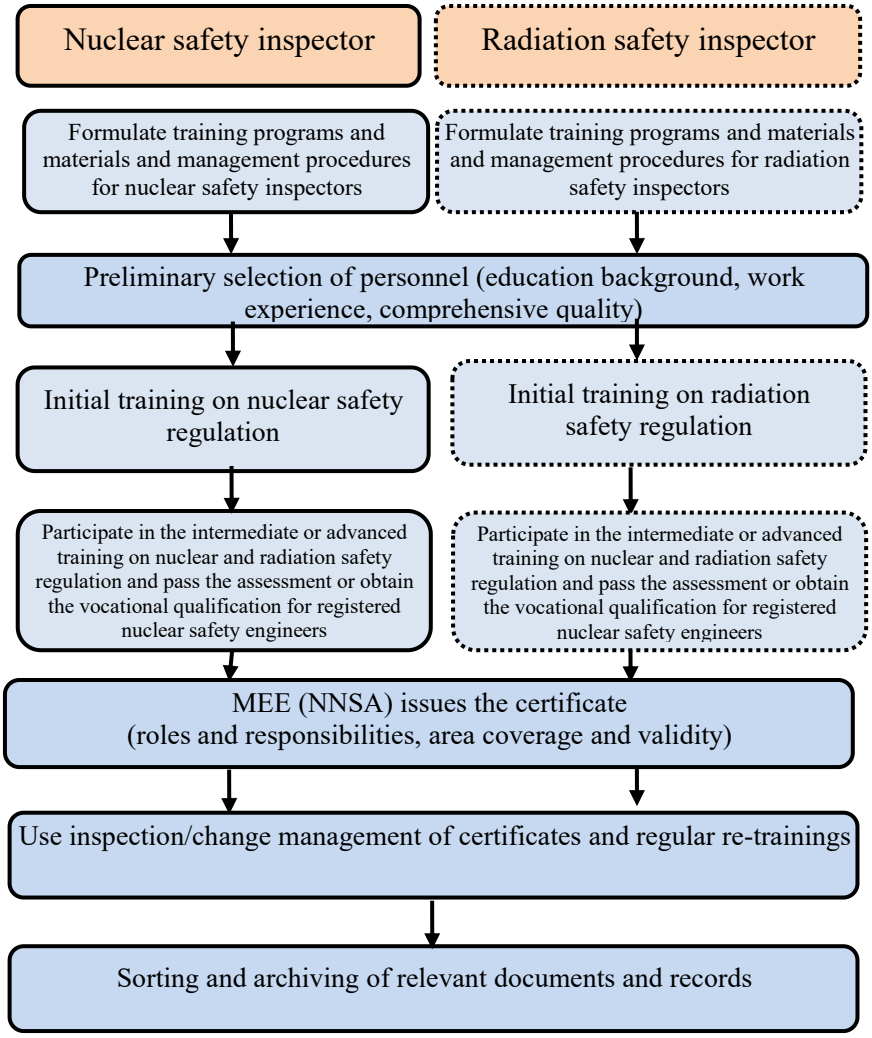


Figure 5-13 Qualification Management Process for Nuclear and Radiation safety inspectors (Central Level)

(6) Reactor operator

According to the *Regulations on the Safety Supervision and Management for Civil Nuclear Facilities* and its detailed rules of implementation, the nuclear facility control systems can only be operated by holders of the nuclear power plant operator or senior operator license of the People's Republic of China. The operator license is valid for two years. In the case of absence from the assigned job for more than six months, the original license will be invalid automatically. In addition, clear requirements have been made for the issuance and management of operator licenses in the *Issuance and Management Procedures for Operator License of Nuclear Power Plants*.

According to the regulations, the competent authority of the nuclear industry shall issue the *Management Methods for License Examination of Nuclear Power Plant*

Operators, and *Standards for License Examination of Nuclear Power Plant Operators*, to specify the examination activities for plant operation personnel. The *Specification of Health Standards and Medical Surveillance for Nuclear Power Plant Operators* define clearly the health requirements for operators and the specific requirements for medical surveillance over operation personnel.

According to relevant requirements, nuclear power plant operating organizations shall formulate and implement a training program for reactor operators, organize a series of strict professional knowledge and skill trainings, and participate in license examination and qualification examination organized by the nuclear power plant operator qualification examination committee. The license examination includes paper examination, simulator test and oral test. The MEE (NNSA) conducts on-site regulatory inspection for the examination process and the assessment process generating the examination results. After passing the examination and qualification examination, the results shall be submitted to the nuclear power plant operator qualification examination committee of the MEE (NNSA) for approval, and the MEE (NNSA) shall issue the reactor operator license or senior operator license. The management of civil research reactor operators follows the management mode of the nuclear power plant operating personnel. The process of qualification examination and management for reactor operators is shown in Figure 5-14.

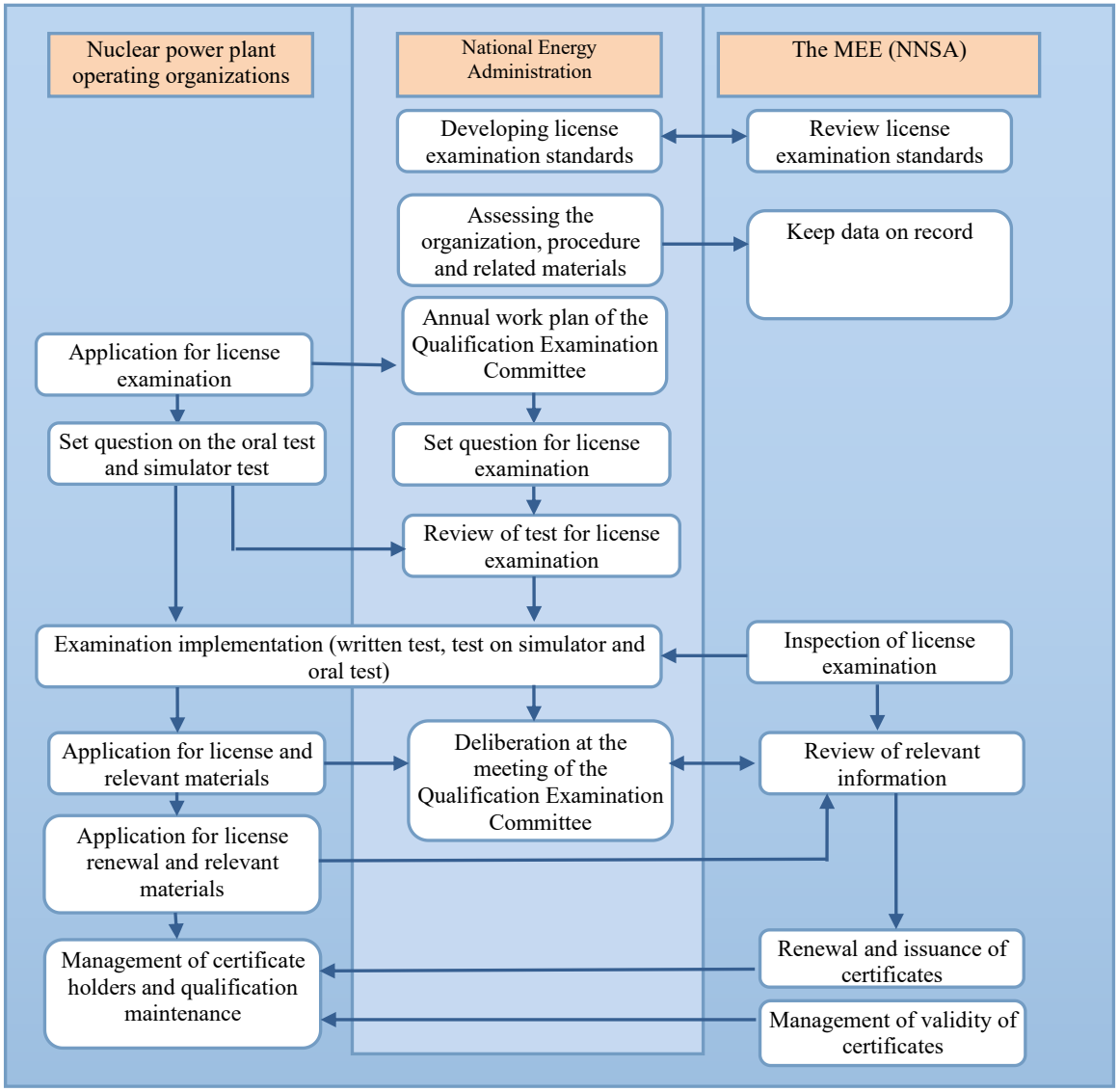


Figure 5-14 The Process for Nuclear Power Plant Reactor Operator License Examination and Qualification Management

(7) Nuclear safety equipment welding and NDT personnel

According to the requirements of the *Regulations on the Supervision and Management for Civil Nuclear Safety Equipment*, the MEE (NNSA) is responsible for approving and issuing qualification certificates for welders, welding operators and NDT personnel of civil nuclear safety equipment, supervising welding and NDT activities, and checking and approving the qualification of overseas organizations engaged in NDT activities of civil nuclear safety equipment in China. The above-mentioned personnel must take the theoretical examination and operation skill test and obtain the qualification certificate before engaging in the welding or NDT activities for civil nuclear safety equipment of the corresponding methods and levels.

For qualification management requirements for personnel important to nuclear and radiation safety, see NNSA/HQ-00-PZ-MP-012, *Guideline for Training of Nuclear and Radiation Safety Inspectors* and NNSA/HQ-00-PZ-MP-013, *Guideline for Qualification Management of Special Personnel in Nuclear Safety*.

5.3.7 Experience Feedback

All departments and organization of the MEE (NNSA) should carry out extensive internal and external experience feedback in all areas under their responsibilities, providing important references for inspection priorities identification, inspection quality and efficiency improvement, and inspection decisions implementation. Main tasks include:

- Formulate and effectively implement internal and external experience feedback systems and procedures, identify experience feedback needs and information collection channels, and designate specially-assigned persons to collect, select, analyze, evaluate and feedback information important to internal and external nuclear and radiation safety on a regular basis.
- The core contents of experience feedback in each business sector mainly include:
  a) Analysis and feedback of important domestic/international nuclear and radiation safety events, including nuclear and radiation events, nuclear facility operation and construction events, etc.;
  b) Monitoring and trending of safety performance indicators of nuclear facilities/activities;
  c) Dynamics of development and revision of national/international nuclear and radiation safety standards;
  d) Development and progress in technology and management of the nuclear energy industry;
  e) Trending of latest nuclear and radiation safety regulation practices and development, etc.
- Use information technology to develop and use experience feedback databases and management systems to gradually establish experience feedback networks and information platforms between regulators and regulated parties, so as to improve the quality, timeliness and range of influence of experience feedback.
- Regularly organize and carry out important information and experience exchange and topical research inside and outside the regulatory system, and

periodically prepare and issue annual experience feedback reports, special reports of experience feedback and specific study reports in various areas.

- Inspect and supervise experience feedback activities inside the regulatory system and regulated parties on a regular basis, continuously improve the experience feedback, promote full exchange and sharing of information and experience, and build a learning-oriented organization in an all-round way.

For detailed requirements on experience feedback, see NNSA/HQ-00-ZG-MP-008, *Guideline for Experience Feedback on Nuclear and Radiation Safety*.

VI. Assessment and Improvement

6.1 General Requirements

In order to ensure that the various work contents and requirements of China nuclear and radiation safety management system can be effectively observed and implemented, and to achieve continuous improvement, managers at all levels of various departments and organizations of the MEE (NNSA) formulate and implement relevant systems and procedures, continuously monitor the work quality of various elements and activities of the management system, and evaluate the effectiveness of the operation of the management system; identify the problems in the operation of the system and the development and changes of the internal and external environment of the organization in a timely manner, continuously adjust the objectives, policies and strategies of the organization and improve and create working methods; continuously improve the quality and efficiency of regulatory activities to better fulfill the regulatory responsibilities given by laws and regulations and meet the needs and expectations of the public and all relevant parties.

Managers at all levels of the MEE (NNSA) continuously monitor and evaluate the management system through various means, including self-assessment, independent assessment, internal assessment and external assessment, as shown in Figure 6-1. The development and evaluation of nuclear safety culture is described in Section 2.4.

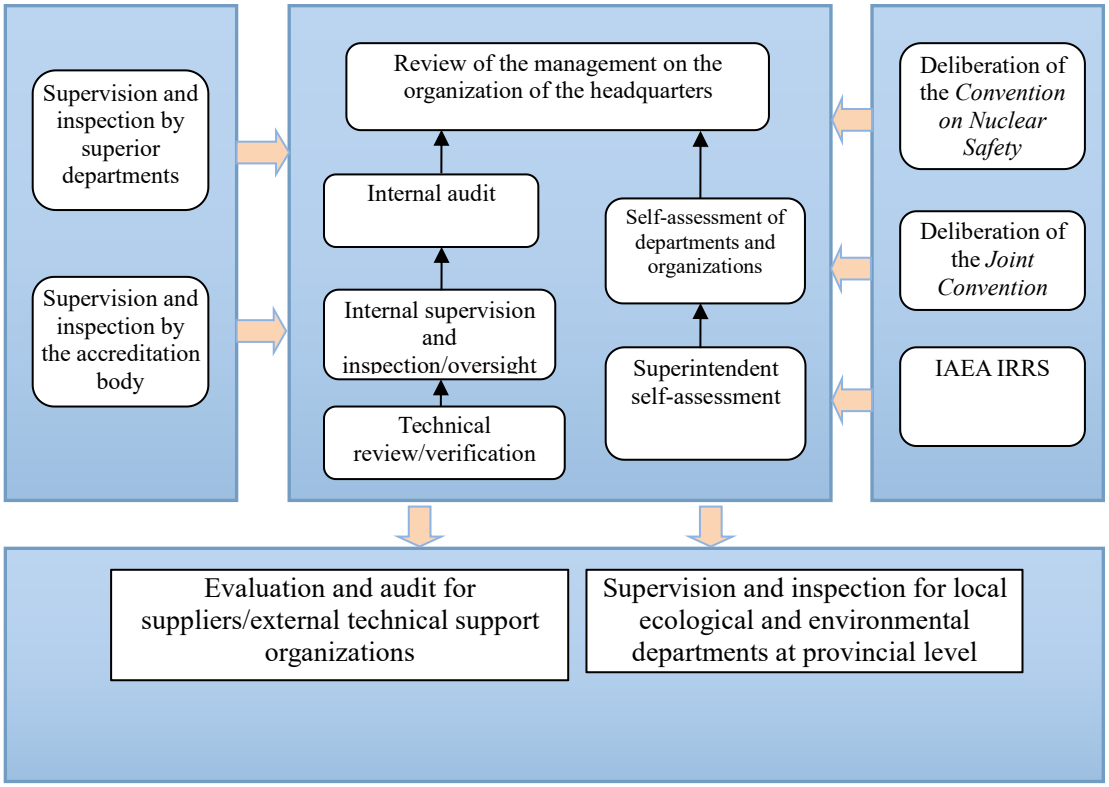


Figure 6-1 Monitoring and Assessment Methods for China Nuclear and Radiation Safety Management System

6.2 Self-assessment

(1) Management self-assessment

The MEE (NNSA) inspects and determines the key tasks performed by various departments/organizations and their progress, identifies problems, provides necessary management coordination and support, and ensures that various activities can hit the predetermined targets through regular meetings, including Ministers Special Meeting, Administrators Working Meeting, Department Affairs Meeting, Office Heads Working Meeting, semi-annual and annual summary meetings, etc. Among them, the more formal self-assessment methods include annual superintendent self-assessments and annual departmental/organizational self-assessments.

The annual summary report of each department and organization at headquarters must make self-assessments on the department's annual work performance. As a minimum, the followings shall be described as important inputs for the review of the management departments of the entire regulation system:

- Main work performance and status of task completion;
- Major regulatory activities implemented this year;
- Important issues identified during the regulatory process and their handling;

- Safety performance and trend of the licensees under regulation;
- Progress of internal and external nuclear safety culture development;
- Investigation and analysis on satisfaction of relevant parties;
- Analysis of changes in internal and external conditions of the organization;
- Areas for improvement in the management system;
- Next year's work priorities and planned improvements, etc.

(2) Management review

Senior managers of the MEE (NNSA) organize a systematic review for the management system at least once a year, focusing on inspecting the implementation of the comprehensive management program, identifying, evaluating and correcting the weaknesses in the management system and the factors hindering the realization of the organization's objectives, and determining whether reforms or improvements are necessary for policies, objectives, strategies, plans and processes. The personnel involved in the management review include the main management official and technical backbone of various departments and organizations.

Department of Nuclear Facility Safety Regulation is responsible for drafting the report on the operation of China nuclear and radiation safety management system on the basis of annual summary and self-assessment reports of relevant departments/organizations and submitting it to the management review meeting for discussion. The report covers the followings as a minimum:

- Overall evaluation of the operation of the management system;
- Important work achievements this year and progress of organizational planning;
- Major regulatory activities completed and the realization of safety objectives;
- Results of internal and external monitoring and evaluation and the implementation of corrective actions;
- Internal and external nuclear safety culture status and improvement;
- Follow-up improvement actions of the management system;
- Management system documents to be supplemented, revised or improved;
- Future regulatory challenges and coping strategies.

6.3 Internal Independent Assessment

(1) Technical review and verification of activities/documents

The most commonly used independent assessment method in the operation of China nuclear and radiation safety management system is the technical review and

verification of activities/documents. Each department and organization shall, in accordance with the importance of the activities or documents to be executed, carry out one or more of the following technical review and verification methods for the activities under their responsibilities:

- Designate qualified technicians for technical review;
- Hold internal technical review meetings in the department/organization;
- Organize external expert review meetings;
- Select control points to supervise and witness important activities;
- Independent review, calculation or test verification for important items under regulation.

The personnel involved in the above-mentioned technical review and verification are qualified and competent in the technical area under review, have sufficient qualifications and experience, authorities and organizational independence, and do not directly participate in the work under review and verification.

(2) Supervision and inspection/work oversight system

In order to ensure the smooth implementation of government decrees and improve work efficiency, the MEE (NNSA) implements a supervision and inspection/work oversight system. All departments and organizations designate specially-assigned personnel to inspect and urge the followings:

- Work arrangement and instruction requirements of superior departments and senior leaders;
- Related important items of other government departments to be handled by MEE (NNSA).
- Implementation of the agreed items at the national and system-wide important conferences on ecological environment protection and nuclear safety;
- Progress of key tasks;
- Supervision and inspection of local ecological environmental protection departments.

(3) Inspection and evaluation of suppliers/contractors

All departments and organizations of the MEE (NNSA) shall, according to the contractual requirements, inspect and verify the important points of the activities performed by their suppliers or project contractors. When the project is completed or finished, strict verification and acceptance shall be made for final products and achievements. They shall conduct a periodic inspection and evaluation on the overall performance of suppliers/contractors as important bases for maintaining their

qualified supplier qualifications in the future.

(4) Audit of management system

The MEE (NNSA) audits regularly the management system in a systemic manner. Importance shall be attached to checking whether the requirements of this system are implemented strictly and effectively, evaluating the suitability of work performance and leadership, the effectiveness of each process in satisfying and achieving the organizational objectives and planning, and the safety culture of the organization, and determining the improvements to be made.

Department of Nuclear Facility Safety Regulation of the MEE (NNSA) is responsible for the organization, management and coordination of the audit of the management system. Main tasks include:

- Develop audit procedures and plans of the management system, select and train audit team leaders and auditors, and organize audits for the system;
- Organize the formulation and implementation of improvement action plans for the problems identified in the system audit;
- Follow up the implementation of action plans and continuously improve the management system.

The audit team is responsible for the implementation of the management system. The audit team leader is appointed by the senior management of MEE (NNSA), and various departments and organizations select and dispatch auditors to participate in the audit. Members of the audit team shall be subject to the training of IAEA IRRS on reviewers, or the training of nuclear facility quality assurance auditors.

The audit of China nuclear and radiation safety management system follows IRRS methods and procedures, as shown in Figure 6-2. It involves the professional departments of the headquarters, regional offices and technical support organizations and activity areas under their responsibility. The methods used mainly include: document record review, personnel interview, on-site walk-downs, observation and witness of the activity execution process, etc. Audit results shall be reported directly to the senior management of the MEE (NNSA) in an official document, as well as all relevant departments and organizations.

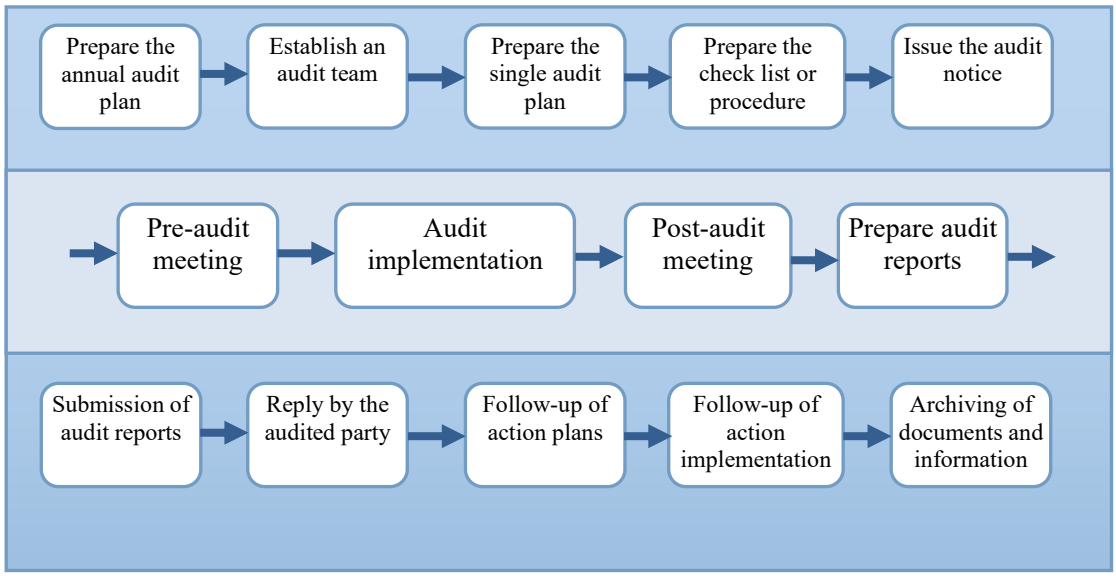


Figure 6-2 General Audit Process for China Nuclear and Radiation Safety Management System

6.4 External Independent Assessment

(1) Laboratory accreditation and inspection

The Radiation Environmental Monitoring Laboratory of the MEE (NNSA) bears a major responsibility in the radiation environmental monitoring and information dissemination throughout the country. In order to ensure reliable and accurate monitoring data, the Radiation Environmental Monitoring Laboratory shall establish a laboratory quality assurance system in conformity with relevant national requirements, apply for national laboratory accreditation, and regularly accept supervision and inspection by external accreditation bodies.

All departments and organizations plan, manage and coordinate the related third-party accreditation, supervision and inspection of their respective laboratories. Main tasks include:

- Formulation and implementation of laboratory quality management manuals, systems and procedures;
- Preparation, implementation and coordinated management of laboratory accreditation and supervision and inspection;
- Formulation and implementation of the improvement action plans for problems identified in supervision and inspection;
- Continuous improvement of laboratory management manuals, procedures, and working processes.

(2) Peer review of implementation of international convention

China has acceded to a series of international conventions in nuclear safety. Among them, the implementation of the *Convention on Nuclear Safety* and the *Joint Convention on the Safety of Spent Fuel Management and Radioactive Waste Management* is organized by the MEE (NNSA), which regularly prepares China's national reports, attends the Review Meeting, and is reviewed by international peers.

The International Department of the MEE (NNSA) is responsible for the organization, management and coordination of the execution of the two international conventions. Main tasks include:

- Formulate and effectively implement the procedures for execution, earnestly fulfill the responsibilities and obligations stipulated in international conventions, and actively participate in activities under the framework of the Convention;
- Conduct self-assessment of nuclear and radiation safety at the national level and organize the preparation of China's national reports;
- Organize responses to questions raised by parties on China's national reports and the attendance of execution review conferences, and accept peer review by the international community;
- Organize the formulation and implementation of corresponding action plans for problems identified in peer review, so as to ensure that the obligations of the Convention for the parties and the requirements from the review conference are effectively implemented in China;
- Organize and participation in the deliberation of other parties, and actively participate in the development and revision of the Convention rules and other related activities, etc.;
- Collect, select, analyze and feedback the international nuclear and radiation safety dynamics and important information obtained in the execution of the Convention, so as to improve the domestic nuclear and radiation safety regulation.

(3) IAEA IRRS

The MEE (NNSA) applies to IAEA for peer review of China nuclear and radiation safety regulation authorities by the international community on a regular basis. According to the latest IAEA safety standards and good practices in international nuclear safety regulation, the MEE (NNSA) identify areas for improvements in nuclear and radiation safety regulation from an external perspective, draw on the lessons learned from other countries, and continuously improve the regulation level.

The International Department of the MEE (NNSA) is responsible for the organization management and coordination of IRRS peer reviews, supported by related departments and organizations. Main tasks related to IRRS activities include:

- Liaison, preparation, implementation and coordination management of IRRS peer reviews;
- Organize self-assessment of nuclear and radiation safety regulation and prepare self-assessment reports;
- Organize the formulation and implementation of improvement action plans for the problems identified in peer review;
- Continuous improve management system documents and working processes through experience feedback.

6.5 Continuous Improvement

The management department of the MEE (NNSA) shall, in response to the above-mentioned problems raised through various monitoring and evaluation methods and in consideration of daily management and regulation practices, formulate improvement action plans in a timely manner, define responsibilities, provide resources, and track and check the effectiveness of improvement measures. Senior managers of various departments and organizations assign departments to review and confirm the implementation and effectiveness of improvement measures.

In addition, the following important factors shall be taken into consideration when improving the management system:

- Major modifications of international nuclear safety objectives and standards;
- Significant changes in the nuclear energy development policy and environment;
- Test analysis results of nuclear facility/activity safety performance objectives;
- Lessons learned from other countries or organizations;
- Innovation and advancement in nuclear and radiation safety technology;
- Rational suggestions from relevant parties, etc.

For management requirements on assessment and improvement, see NNSA/HQ-00-ZG-AP-013, *Guideline for Assessment and Improvement*.

Annex 1

Guideline for the Preparation and Management of Procedures and Systems

1. Purpose

This guideline is formulated in order to effectively organize, manage and implement the preparation of the procedures and systems of China nuclear and radiation safety management system of the MEE (NNSA), and to ensure that the documents developed are complete, correct, applicable, coordinated, self-consistent, and easy to be understood and implemented

2. Scope of Application

This guideline is applicable to the planning, preparation, review, approval, release, distribution, periodic evaluation and continuous improvement of the General Principles of the MEE (NNSA) management system and its supporting procedures.

3. Terms and Definitions

The MEE (NNSA)

It is the nuclear and radiation safety regulatory body of China, which is fully responsible for the regulation of the national nuclear safety, radiation safety and radiation environmental protection, and implements unified and independent regulation of the nationwide civil nuclear facilities and nuclear technology application. Its central level consists of the headquarters, six regional offices and two technical support organizations (one directly subordinated organization and one multi-identity technical support organization). Provincial and municipal and other local ecology and environment departments also assume some functions of nuclear and radiation safety regulation.

Management System

It is a complete and coordinated management system. In this system, all elements of the organization are integrated to achieve the organization's goals. The elements include organization structure, resources and organizational working process. Personnel, facilities and equipment, organizational culture and written organizational policies and procedures are also part of the management system. The organizational

procedures must specify all requirements that the organization shall meet, and are stipulated by stakeholders, IAEA safety standards and other applicable laws and standards.

4. Organization Structure and Assignment of responsibilities

Considering that the preparation and management of management system procedure is of extensive coverage and a long-term systematic task, a leading team, coordination team and preparation team are established to consolidate the overall coordination and management for the construction of the nuclear and radiation safety system.

(1) Leading Team

Lead the construction of the nuclear and radiation safety regulation procedure and system, approve the relevant work arrangements, the General Principles and the procedure and system, evaluate the applicability of the General Principles and the procedure and system on a regular basis, and organize revision and upgrade in a timely manner when necessary. The team leader is Administrator of NNSA. Team members include Chief Nuclear Safety Engineer of MEE, director general of all nuclear safety professional departments, heads of regional offices and internal technical support organizations.

(2) Coordination Team

Be responsible for the implementing arrangement of the leading teams; formulation and implementation of the General Principles and the procedure and system establishment and revision plan. Organize the planning, establishment and revision and review of the General Principles and the procedure and system, regularly report the progress, determine the preparation requirements and standard templates of the procedure and system, provide recommendations and suggestions on common issues, and follow up and urge the establishment and revision of the procedure and system. Office Head of the Nuclear Facility Safety Regulation Department serves as the team leader. Team members include the heads of offices/chief of Division of Comprehensive Affairs of each professional department.

(3) Preparation Team

Be responsible for making the preparation requirements and standard templates of the procedure and system, and for the preparing and maintaining of the General Principles. Be responsible for preliminary reviewing of the formulated documents, and propose recommendations for improvement according to verified experience

feedback from application of the General Principles and the procedures and system.

Senior personnel in the management system area are designated as the team leader. Team members include the division heads in charge of management system operation and technical backbones in all professional departments, regional offices and internal technical support organizations.

(4) Various relevant departments and organizations

In accordance with the division of business, they are responsible for the planning, preparation, submission for approval and interpretation of the procedures and systems. They shall strictly abide by the requirements of the General Principles and the procedures and systems, provide feedback for the problems identified in the implementation of system documents and give suggestions on modification. If necessary, revise and upgrade the procedures and systems under charge.

The Nuclear Facility Safety Regulation Department is responsible for the centralized management of Level I and Level II documents, including releasing the latest list of procedures and systems of the management system and organizing the evaluation of the General Principles and Level II documents on a regular basis. The Nuclear and Radiation Safety Center designates specially-assigned persons to upgrade and maintain the management system on a regular basis. Six regional offices, led by the Northern China Regional Office, organize the preparation and maintenance of inspection documents. Each organization is responsible for the preparation and maintenance of their Level IV documents.

5. Objectives, Principles and Work Approaches

(1) Objectives

Through the top-level design, scientific formulation and effective implementation of the General Principles and the procedures and systems, promote the modernization of the nuclear safety regulators management philosophy, management methods and management process, provide systematic, scientific, standardized, information-based and delicate methods and tools for regulation, and provide a system guarantee for the modernization of the nuclear and radiation safety regulation system and the modernization of the regulatory capacity.

(2) Principles

Being systematic, complete and standardized;

Being hierarchical, coordinated and self-consistent;

Being appropriately detailed and easy to operate;

Knowledge transfering and experience sharing.

(3) Work approaches

Preparation of the General Principles of Safety Management System

In conformity with the requirements of China nuclear and radiation safety regulations and regulatory practices, drawing on the relevant IAEA safety standards and international good practices, and in conjunction with the development and changes in internal and external environment of the MEE (NNSA), the *General Principles of China Nuclear and Radiation Safety Management System* is formulated for the entire nuclear and radiation safety regulatory system.

Planning and preparation of the procedures and systems

On the basis of the General Principles of the management system, the top-level design of the procedures and systems is carried out to create a complete and hierarchical framework to minimize unnecessary overlap and avoid conflicts or omissions. The procedures and systems should be prepared in a standardized and normalized manner, and each task/regulation activity shall be ensured under responsibility, rule-based, well documented and verified. Strengthen the ideology of managing people with the system, and embody the core requirements related to internal management in the procedures and systems as much as possible, making it a long-term mechanism.

Transfer and development of regulation practices

Identify and extract good practices accumulated from the regulation system over the years, and make them communicated and promoted among different sectors to balance transfer and development. It is necessary to provide adequate communication, discussion and cooperation in the implementation of the top-level design of the procedures and systems and adhere to the basic principles while maintaining open and flexible.

Continuous improvement and perfection

All relevant personnel shall be organized to study the General Principles and the procedures and systems after their release, which shall be strictly observed in the work. Periodic evaluation and feedback shall be conducted for the implementation and effect of the General Principles and the procedures and systems, and timely improvement shall be made when necessary.

6. File Structure and Preparation Requirements of Management System

6.1 Tier Structure of Management System Documents

The management system documents of the MEE (NNSA) are divided into four levels.

(1) Level I

The General Principles describes the general structure, contents and requirements of the management system.

(2) Level II

Guideline and technical management programs for each management element and business sector, which are divided into three modules, including guidelines for integrated management, guidelines for business management and general technical management programs.

Module A: Guidelines for Integrated management

These guidelines focus on the internal management of administrative affairs and comprehensive affairs of the MEE (NNSA) regulation system, involving the main processes and elements of management responsibilities, support and guarantee, general management process and evaluation and improvement in the management system.

Module B: Guidelines for Business management

These guidelines focus on the internal management and control of the important regulation functions of the MEE (NNSA), involving the main processes and elements of the core process of the management system. The emphasis is placed on the management, clarifying responsibilities, and streamlines interfaces to ensure that various activities are under responsibility, rule-based, well documented and verified.

Module C: General technical management programs

The programs focus on core processes with emphasis on the technology. In accordance with the requirements of applicable codes and standards, it is necessary to define the general key regulation points, regulation contents, regulation methods and frequency of the lifetime of nuclear facilities and the whole process of nuclear activities.

(3) Level III

It refer to detailed rules/procedures, supporting procedures of general technical management program, special technical management program and its supporting procedures, and applicable rules and regulations quoted or referenced by Level II documents.

(4) Level IV

Each professional department, regional offices and directly subordinated

organization shall establish their internal procedures and systems respectively in conformity with actual practices.

See Annex 1 for the list of Level II and Level III procedures and systems.

6.2 Requirements for Preparation of Management System Documents of Various Levels

6.2.1 Requirements for Preparation of the General Principles of the Management System

According to the requirements of relevant IAEA safety standards and the national regulation practice, the General Principles of the management system shall fully address the organizational policies, objectives and planning of the MEE (NNSA), organizational structure and management responsibilities, construction of nuclear safety culture, resources and management required for the fulfillment of regulation responsibilities, main work contents and requirements of important processes of the management system, and measures taken to realize continuous improvement of the system. For all business sectors and related activities involved, the General Principles can provide clear working standards and basis for all personnel in the regulation system, which shall be conducive to improving the quality of regulation activities, enhance the authoritativeness and effectiveness of nuclear safety regulation, and improve and continuously perfect the nuclear and radiation safety regulation system of China.

The General Principles shall cover all regulation functions of the MEE (NNSA) and all relevant activities of the management system; all relevant departments/organizations within the regulation system and their staff, including the headquarters, regional offices and technical support organizations. Relevant factors shall be taken into comprehensive consideration, including safety, health, environment, security, quality, economical efficiency, etc., to ensure consistently maintain the first priority of nuclear safety, and the consideration of other factors will not be detrimental to nuclear safety, when implementing regulation activities.

6.2.2 General Preparation Requirements for Procedures and Systems

Before documentation, it is necessary to completely collect and analyze the requirements of all relevant documents, and the following relationships shall be properly managed:

(1) Relationship with the upstream nuclear and radiation safety regulation documents

Business guidelines and technical management programs should fully reflect the key regulation points in the corresponding nuclear and radiation safety regulation

documents, and describe how the MEE (NNSA) regulation practices evaluate and verify that these regulation points and requirements are satisfactory.

(2) Relationship with the General Principles

As a supporting document of the General Principles, Level II documents should not simply repeat the requirements of the General Principles, but expand and detail the requirements of the General Principles from an operational perspective. Those described clearly in General Principles can be directly quoted and simply mentioned. Main tasks/activities included in Level II documents shall be discussed one by one according to organization structure and responsibilities, main work contents and requirements and main working processes. The assignment of responsibilities should be specific to the business offices. The complicated assignment of responsibilities and interface relationship should be described in the responsibility allocation table. For a specific regulation activity, when the nuclear and radiation safety regulation requires the formulation and implementation of detailed working rules, the detailed operational requirements shall be elaborated in Level III documents, and Level II guidelines can be described in a simplified manner.

(3) Relationship with the system documents of the MEE

The main points of the applicable requirements for the applicable system documents of the MEE shall be summarized in the supporting documents of the management system, which shall address the specific requirements and practices of the NNSA. The list of applicable system documents of MEE shall be included as an annex to the supporting documents.

(4) Relationship with the procedure and system documents planned by various professional departments

All kinds of documents related to the management system that have been or are planned to be formulated by various professional departments of the NNSA can be classified into the subjects of the corresponding guidelines/technical management programs and used as the implementation procedures of the next Level of the guidelines/programs. The function of guidelines/technical management programs is to provide a panoramic view and route map for such subject, presenting its main management points completely without specific details, and the document user can find the appropriate implementation procedures according to the route map.

(5) Relationship with the system documents of regional offices/technical support organizations

The relatively complete system of system documents of regional offices and technical support organizations provides a good reference for the formulation of

supporting documents of the General Principles. It is necessary to read and understand completely the applicable documents of regional offices and technical support organizations in advance when preparing the General Principles. On this basis, integration, abstract and optimization should be made to standardize and normalize the same regulation processes and requirements and minimize unnecessary differences as much as possible. Furthermore, it is necessary to check the omissions and make supplements according to the requirements of relevant nuclear safety laws and regulations and the present regulation practices.

(6) Relationship with the internal red documents issued by the MEE(NNSA)

Some internal red documents (government documents) issued by NNSA put forward requirements for the internal management of the regulation system. These requirements should be integrated into the relevant Level II guidelines to make it is effective in a long-term mechanism. In the future, efforts shall be made to try not to release similar requirements in the form of scattered red documents but formulate or revise the corresponding management system documents.

(7) Relationship between *Guideline for Nuclear and Radiation Safety Regulatory Inspection* and various inspection programs

The *Guideline for Nuclear and Radiation Safety Regulatory Inspection* focus on describing the general management requirements and processes of regulatory inspection, standardizing and normalizing the same requirements and practices of existing inspection programs/procedures, minimizing unnecessary differences as well as reducing the number of homogeneous execution documents. The general inspection program puts the emphasis on describing the general inspection requirements and key points for a certain type of nuclear facilities/nuclear activities, covers the lifetime of nuclear facilities and the whole process of nuclear activities, fully presents the key regulation points corresponding to nuclear and radiation safety laws and regulations and current regulation practices. The detailed requirements are elaborated in the implementation procedures.

Differences in regulatory inspection requirements for different power plants and different types of reactors can be reflected in the implementation procedures, so as to make the general inspection program more widely applicable. Regional offices may directly use it as required, or make customized modifications on the basis of this program and formulate a special inspection program in combination with the characteristics of specific facilities or activities. Whether it is necessary to formulate a special inspection program according to the reactor type, plant, unit and phase, is at the discretion of the professional department and the regional office.

(8) Relationship between Level II and Level III documents

Level II guidelines focus on process management, specify the assignment of responsibilities, main work contents and workflow of each relevant department/organization. Level III documents describe the specific implementation details, requirements and steps. It is not necessary to formulate Level III documents for what can be clearly described in Level II documents. The next Level of guidelines correspond to detailed rules and procedures. The format, content requirements, complexity and quantity of Level III documents shall be independently determined by each professional department. It is necessary to make comprehensive weighing to minimize the number of procedures, because too scattered procedures will affect the overall awareness and judgment, and increase the interface and omission risks between execution documents.

The technical management program focuses on describing the technical aspects of the core process. Upon the completion of program preparation, the top-level design list of the supporting procedures/implementation procedures is provided. Existing procedure resources in regional offices may be made full use of, abstracted and summarized to upgrade them as Level III documents of the management system. It is suggested to integrate similar items and minimize the number of execution procedures without reflecting specific technical parameters and details, so as to make it more versatile. Technical details can be obtained on site by consulting work execution documents/technical standards of the regulated party, or a summary list of important technical parameters can be prepared as an annex to the procedure.

(9) Preparation principles for Level IV documents

Level IV documents may be prepared by each department, regional office, directly subordinated organization at their own discretion in accordance with actual demand. The preparation principle, framework, format, and content are as shown in the requirements of above-mentioned Level documents.

See Table 1 for the general format and requirements of Level II guidelines. This Guideline is also used as a specific example. The catalogue arrangement can be flexibly adjusted as required, and a consensus shall be reached through communication with the preparation team in advance. Annex 2 and 3 provide a framework example or suggestion for the preparation of the nuclear facility inspection program and nuclear facility safety review program. The specific preparation format may be at the discretion of each professional department, using this example as a reference. The general format and requirements of detailed Level III rules and the programs supporting procedures shall be determined by each professional department.

Table 1 General Format and Content Requirements of the Guidelines of the MEE (NNSA)

Section No.	Title	Content Requirements
1	Purpose	The purpose of preparing this Guideline.
2	Scope of application	Applicable departments/organizations and personnel, applicable business sectors and activities.
3	Terms and definitions	Explain the abbreviations and definitions of important terms used in the document.
4	Organization structure and assignment of responsibilities	The overall organizational structure and responsibilities for implementing this Guideline, including the centralized management department, implementation department, support and coordination department.
5	Guiding ideology and objectives	The important guiding ideology, principles, working approaches and working objectives under this subject; the title can be adjusted as required.
6	Main processes	Determine the main working processes covered under the subject of this Guideline. Each process shall be presented item by item according to the assignment of responsibilities (when it is difficult to be included in Chapter 4), main work contents and requirements, main working processes, etc. Chapter arrangement can be flexibly adjusted.
7	Inspection and evaluation of work quality	Who checks and how to evaluate the quality of each working process.
8	Documents to be collected and preserved	List of categories of documents to be collected and preserved.
9	Annex	Provide a list of the reference/supporting documents of this Guideline, standard work forms used in the work and other supplementary information.
Note: The format, font, font size, line spacing, paper header and page number of the cover/table of contents/main body shall be subject to this guideline. The coding of documents shall follow the relevant requirements of the General Principles.		

6.3 Preparation and Management Process of Procedure and System Documents

Managers of the departments responsible for the preparation of various Level documents shall select qualified personnel to prepare and review documents. Such personnel shall have relevant knowledge and experience and understand relevant background materials to ensure the suitability, correctness and operability of

document contents. The schematic of the preparation and management process of the General Principles and Level II documents is shown in Figure 2. The responsible organization shall provide suggestions on the documentation list according to the work requirements, submit them to the coordination team to integrate and formulate the documentation plans and requirements, and then organize the implementation after the approval by the leading team. The responsible organization designates the document writers, who will be trained by the preparation team. Upon the completion of the first draft of the document and approval by the department, it shall be submitted to the preparation team for review and feeding back revision comments. After the revision of the responsible organization, the responsible professional department shall organize the review and discussion within the department to generate a review draft, which will be formally submitted to the coordination team after confirmation by the preparation team. The coordination team organizes a review meeting to generate a draft for approval, and solicits the comment of relevant professional departments and organizations. The draft for approval shall be submitted to the leading team for examination and approval after revision according to the feedback and then submitted to the Administrators Working Meeting for approval.

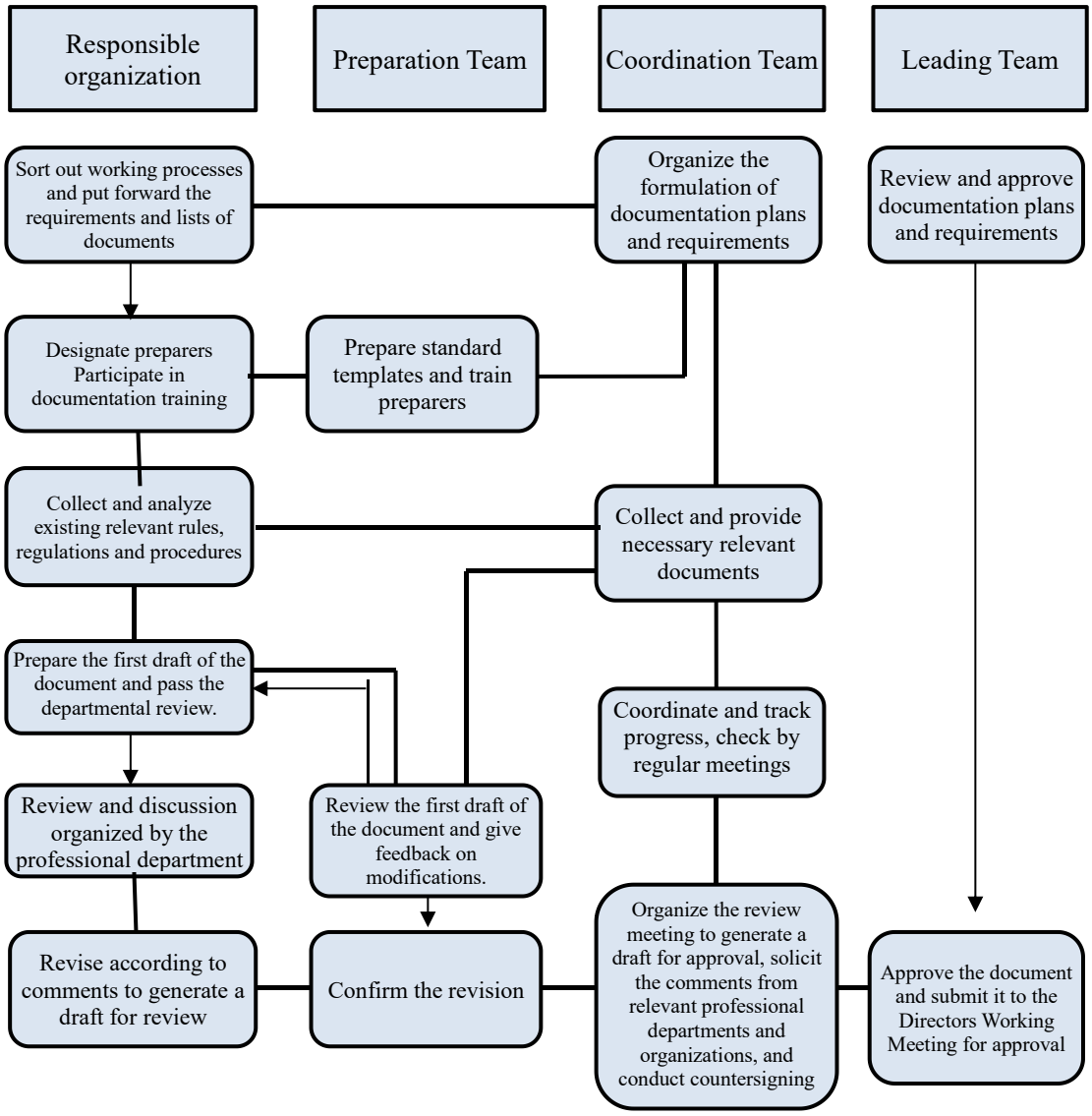


Figure 1 Preparation and Management Process of Level II Documents

7. Review and Evaluation of Document Quality

The departments/organizations in charge of the preparation of various procedures and systems are responsible for the quality of the documents they prepared. Level I and Level II documents shall be submitted to the preparation team for review, submitted to the leading team for deliberation after approval, and then approved and released by the Administrators Working Meeting. Level III documents shall be prepared, reviewed, approved, released, revised and managed by each professional department. Level IV documents are also managed by each department/organization.

8. Documents to be Collected and Retained

The MEE (NNSA) implements level-to-level management for documents and records generated in the preparation and management of procedures and systems. Each department/organization is responsible for the complete collection, sorting and retention of documents and materials generated or obtained during the implementation of activities within their respective responsibilities. For important documents and materials, at the headquarters they will be archived and managed by the General Office; in regional offices and technical support organizations, they will be archived and managed by the archives management department in a unified manner. The detailed list of documents to be collected and the retention department are shown in Table 2.

Table 2 List of Documents to be Collected and Retention Department

S/N	Type of Document	Responsible Department	Archives Department	General Office
1	The General Principles of the management system and its supporting Level II documents	Retention	Retention	Retention
2	Detailed working rules and procedures	Retention	Retention	
3	Internal procedures and systems of each department	Retention		
4	Documentation plan and main review comments	Retention		
5	Relevant documents and materials collected and analyzed during documentation.	Retention		

9. Annexes

Annex (1) List of Level II and Level III Procedure and System Documents of China Nuclear and Radiation Safety Management System.

Annex (2) Reference Format of Commissioning Inspection Program.

Annex (3) Reference Format of Safety Review Program.

Annex (1) : List of Level II and Level III Procedure and System Documents of China Nuclear and Radiation Safety Management System.

Level II Documents		**Level III Documents**		**Status**	**Preparation Department**
Integrated Management Guidelines		**Detailed Working Rules**			
NNSA/HQ-00-ZG-AP-001	*Organization Structure and Assignment of Responsibilities*			New edition	Adminstrative Office, Department of Nuclear Facility Safety Regulation
		01	*Implementation Plan of the MEE on Three-stipulations*	In use	Procedures of the MEE
		02	*Three-stipulations Plan and Working System of Nuclear and Radiation Safety Regulation Authority the Ministry of Environmental Protection*	In use	Adminstrative Office, Department of Nuclear Facility Safety Regulation
		03	*Working System of Chief Nuclear Safety Engineer of the Ministry of Environmental Protection (Trial)*	In use	Adminstrative Office, Department of Nuclear Facility Safety Regulation
		04	*Provisions on Main Responsibilities, Internal Organizations and Staffing of Six Regional Offices*	In use	Adminstrative Office, Department of Nuclear Facility Safety Regulation
		05	*Provisions on Main Responsibilities, Internal Organizations and Staffing of Nuclear and Radiation Safety Center (Nuclear Safety Equipment Regulation Technology Center)*	In use	Adminstrative Office, Department of Nuclear Facility Safety Regulation
		06	*Constitution of Nuclear Safety and Environment Advisory Committee*	In use	Adminstrative Office, Department of Nuclear Facility Safety Regulation
		07	*Measures for the Management of Internal Interfaces of Nuclear and Radiation Safety Regulation Authority*	Draft for approval	Adminstrative Office, Department of Nuclear Facility Safety Regulation
		08	*Measures for Management of of Project Officials of the Administration of Nuclear and Radiation Safety Regulation*	Draft for approval	Adminstrative Office, Department of Nuclear Facility Safety Regulation
NNSA/HQ-00-ZG-AP-002	*Guideline for Meeting*			New	Adminstrative Office,

Level II Documents		Level III Documents		Status	Preparation Department
	Management			edition	Department of Nuclear Facility Safety Regulation
		01	*Working Rules of the MEE*	In use	Procedures of the MEE
		02	*Measures for the Management of Meeting Activities of the Ministry of Environmental Protection*	In use	Procedures of the MEE
		03	*Measures for the Management of Administrators Working Meeting*	In use	Adminstrative Office, Department of Nuclear Facility Safety Regulation
		04	*Measures for the Management of Meetings of Nuclear Safety and Environment Advisory Committee*	In use	Adminstrative Office, Department of Nuclear Facility Safety Regulation
NNSA/HQ-00-ZG-AP-003	*Guideline for Document Management*			New edition	Adminstrative Office, Department of Nuclear Facility Safety Regulation
		01	*Measures for the Disposal of Official Documents of the Ministry of Environmental Protection*	In use	Procedures of the MEE
		02	*Guideline for Periodicals of the Ministry of Environmental Protection*	In use	Procedures of the MEE
		03	*Measures for the Management of Nuclear and Radiation Safety Official Documents*	Draft for approval	Adminstrative Office, Department of Nuclear Facility Safety Regulation
		04	*Format Specification for Official Documents*	Draft for approval	Adminstrative Office, Department of Nuclear Facility Safety Regulation
		05	*Measures for the Management of the Preparation and Approval of the Annual Report of the NNSA*	Draft for approval	Adminstrative Office, Department of Nuclear Facility Safety Regulation
		06	*Measures for the Management of the Selective Compiling and Publication of Nuclear and Radiation Safety Documents*	Draft for approval	Adminstrative Office, Department of Nuclear Facility Safety Regulation

Level II Documents		Level III Documents		Status	Preparation Department
NNSA/HQ-00-ZG-AP-004	*Guideline for the Administration of Records and Archives*			New edition	Adminstrative Office, Department of Nuclear Facility Safety Regulation
		01	*Measures for Management of Environmental Protection Archives*	In use	Procedures of the MEE
		02	*Table of Archiving Scope and Storage Time Limit for Official Documents and Materials of the Ministry of Environmental Protection*	In use	Procedures of the MEE
		03	*Official Archives Borrowing System*	In use	Procedures of the MEE
		04	*Confidentiality System of Official Archives and Archives*	In use *	Procedures of the MEE
		05	*Management System for Official Photographs, Audio and Video Materials*	In use	Procedures of the MEE
		06	*Archives Identification and Destruction System*	In use	Procedures of the MEE
		07	*Notice on Further Strengthening the Management of Confidential Documents*	In use	Procedures of the MEE
			Measures for the Management of Scientific and Technological Documents	Draft for approval	Information Office, Nuclear and Radiation Safety Center
NNSA/HQ-00-ZG-AP-005	*Guideline for Procurement Control and Contract Management*			New edition	Adminstrative Office, Department of Nuclear Facility Safety Regulation
		01	*Measures for the Management of Bidding in Government Procurement of Goods and Services*	In use	Procedures of the MEE
		02	*Measures for the Management of Non-bidding Government Procurement*	In use	Procedures of the MEE
		03	*Interim Measures for the Management of Competitive Negotiation in Government Procurement*	In use	Procedures of the MEE
			Measures for the Implementation of Centralized	In use	Procedures of the MEE

Level II Documents		Level III Documents		Status	Preparation Department
		04	*Purchasing Management of Central Government Departments*		
		05	*Measures for the Management of Examination and Approval of Changes to the Government Procurement Methods of Central Budget Departments*	In use	Procedures of the MEE
		06	*Letter on Issues Concerning the Application of Procurement Methods for Government Procurement Projects Not Meeting the Standard of Public Bidding Amount*	In use	Procedures of the MEE
		07	*Measures for the Management of Government Procurement of Imported Products*	In use	Procedures of the MEE
		08	*Detailed Rules for the Confidentiality of Government Procurement Agreement Negotiations on Environmental Protection*	In use	Procedures of the MEE
NNSA/HQ-00-ZG-AP-006	*Guideline for Internal Information Reporting*			New edition	Adminstrative Office, Department of Nuclear Facility Safety Regulation
		01	*Measures for Reporting Information on Environmental Emergencies*	In use	Procedures of the MEE
		02	*Measures for the Ministry of Environmental Protection on Information Reporting of Environmental Emergencies*	In use	Procedures of the MEE
		03	*Notice on Standardized Submission of Meeting Minutes, Information and Briefings*	In use	Procedures of the MEE
		04	*Measures for the Reporting of Government Information Adoption and Quality Evaluation*	In use	Procedures of the MEE
		05	*Measures for the Work on Environmental Protection Governmental Information*	In use	Procedures of the MEE
		06	*Working Rules of the Ministry of Environmental Protection for Handling Motions and*	In use	Procedures of the MEE

Level II Documents		Level III Documents		Status	Preparation Department
			Recommendations of NPC Deputies and Proposals of CPPCC Members		
		07	*Measures for the Management of Internal Information Reporting*	In use	Procedures of the MEE
NNSA/HQ-00-ZG-AP-007	*Guideline for Integrated Management of Infrastructure and Work Environment*			New edition	Adminstrative Office, Department of Nuclear Facility Safety Regulation
		01	*Measures for the Management of State-owned Assets in the Central Level administrative Institutions*	In use	Procedures of the MEE
		02	*Regulations of the Ministry of Environmental Protection on the Management of State-owned Assets Management Information System*	In use	Procedures of the MEE
		03	*Measures of the Ministry of Environmental Protection for the Management of Institutional Fixed Assets*	In use	Procedures of the MEE
		04	*Interim Measures for the Management of State-owned Assets in Institutions of the Ministry of Environmental Protection*	In use	Procedures of the MEE
		05	*Regulation of the Ministry of Environmental Protection on the Management of National Security Work*	In use *	Procedures of the MEE
		06	*Regulations of the Ministry of Environmental Protection on Institutional Fire Safety Management*	In use	Procedures of the MEE
		07	*"Six Prohibitions" of National Environmental Protection System*	In use	Procedures of the MEE
		08	*Detailed Rules for the implementation of Measures for the Management of Target-hitting Appraisal and Recognition Activities (Trial)*	In use	Procedures of the MEE
		09	*Regulations on Management of Public Office Places in Government Bodies*	In use	Procedures of the MEE

Level II Documents		Level III Documents		Status	Preparation Department
		10	*Regulations on Management of Credentials for Government Bodies*	In use	Procedures of the MEE
		11	*Measures for the Management of Seal Engraving and Use of the Ministry of Environmental Protection*	In use *	Procedures of the MEE
		12	*Measures of Ministry of Environmental Protection for Requesting the Leave for Business (private) Affairs*	In use	Procedures of the MEE
		13	*Measures for the Management of Business Travel and Specially Designated Meetings of the Central Level State Organs*	In use	Procedures of the MEE
		14	*Regulations on Paid Annual Vocation of Employees*	In use	Procedures of the MEE
		15	*Regulations on the Management of Domestic Official Reception of Party and Government Bodies*	In use	Procedures of the MEE
		16	*Confidentiality Code for the Office Workers*	In use *	Procedures of the MEE
		17	*Provisions on the Management of Confidentiality of Key Departments and Areas*	In use *	Procedures of the MEE
		18	*Regulations of the Ministry of Environmental Protection on the Use and Management of the Dedicated Secrecy Technology Protection System*	In use *	Procedures of the MEE
		19	*Measures for the Management of the Construction of National Nuclear and Radiation Safety Regulation Technology Research and Development Base*	In use	Adminstrative Office, Department of Nuclear Facility Safety Regulation
		20	*Measures for the Secrecy Management of Nuclear and Radiation Safety Regulation*	In use *	Adminstrative Office, Department of Nuclear Facility Safety Regulation
		21	*Rules for the Improving the Work Style of the Nuclear and Radiation Safety Regulation System*	Under revision	Adminstrative Office, Department of Nuclear Facility Safety Regulation
NNSA/HQ-00-ZG-AP-008	*Guideline for Human Resources Management*			New edition	Adminstrative Office, Department of Nuclear Facility

Level II Documents		Level III Documents		Status	Preparation Department
					Safety Regulation
		01	*Measures for Personnel Service in the Organs of the Ministry of Environmental Protection*	In use *	Procedures of the MEE
		02	*Measures for Personnel Service in Dispatched Institutions of the Ministry of Environmental Protection*	In use *	Procedures of the MEE
		03	*Measures for Personnel Service in Institutions Directly under the Ministry of Environmental Protection*	In use *	Procedures of the MEE
		04	*Measures for the Supervision of Personnel Service Related to Official of the Ministry of Environmental Protection*	In use *	Procedures of the MEE
		05	*Measures for the Management of Establishment of Organizations of the Ministry of Environmental Protection*	In use	Procedures of the MEE
		06	*Interim Measures on the Probation Period of Leading Official*	In use	Procedures of the MEE
		07	*Measures for Reporting the Work and Integrity by Party Members and Leading Official of the Ministry of Environmental Protection*	In use	Procedures of the MEE
		08	*Measures for the Management of Official Training of the Ministry of Environmental Protection*	In use	Procedures of the MEE
		09	*Management Measures for Assuming Temporary Post (Learning) of the Ministry of Environmental Protection*	In use	Procedures of the MEE
		10	*Guidance on the Training of Nuclear and Radiation Safety Regulation Business of the NNSA*	In use	Division of Personnel Qualification, Department of Nuclear Facility Safety Regulation
		11	*Measures for the Organization and Management of Training of Nuclear and Radiation Safety Inspectors*	In use	Division of Personnel Qualification, Department of

Level II Documents		Level III Documents		Status	Preparation Department
					Nuclear Facility Safety Regulation
		12	*Measures for the Management of Certificates of Nuclear and Radiation Safety Inspectors*	In use	Division of Personnel Qualification, Department of Nuclear Facility Safety Regulation
NNSA/HQ-00-ZG-AP-009	*Guideline for Knowledge Management and Informatization Construction*			New edition	Adminstrative Office, Department of Nuclear Facility Safety Regulation
		01	*Measures for the Knowledge Management of Nuclear and Radiation Safety Regulation*	Draft for approval	Information Division, Nuclear and Radiation Safety Center
		02	*Measures for the Management of the National Environmental Protection Administration's Integrated E-government Platform*	In use	Procedures of the MEE
		03	*Assessment Measures for Information Release on the National Environmental Protection Administration's Integrated E-government Platform and Website*	In use	Procedures of the MEE
		04	*Measures for the Management of National Environmental Protection Video Conference System*	In use	Procedures of the MEE
		05	*Regulations on the Management of E-government Information Exchange Platform of the Ministry of Environmental Protection*	In use	Procedures of the MEE
		06	*Notice on Further Strengthening the Prevention of Cyber Burglary and Divulge*	In use	Procedures of the MEE
		07	*Rules for the Operation and Maintenance of the NNSA Portal*	In use	Information Division, Nuclear and Radiation Safety Center
NNSA/HQ-00-ZG-AP-010	*Guideline for the Management of International Exchange and Cooperation and Foreign Affairs*			New edition	Division of the International Cooperation on Nuclear Safety, International Department

Level II Documents		Level III Documents		Status	Preparation Department
		01	20126*Regulations on the Management of Foreign Affairs of the Ministry of Environmental Protection* (HB2012 No. 6)	In use *	Procedures of the MEE
		02	2013533Notice of Ministry of Finance on printing and distributing of the *Measures for the Management of Funds for Foreign Guests Reception for Central and State Organs* (CH2013No.533)	In use *	Procedures of the MEE
		03	2013516Notice of the Ministry of Finance and the Ministry of Foreign Affairs on printing and distributing the *Measures for the Management of Funds for Temporarily Going Abroad on Business* (CH2013No.516)	In use *	Procedures of the MEE
		04	2012126*Notice of the State Administration of Foreign Experts Affairs and the Ministry of Finance on Adjusting the Expenditure Standards for Medium-and Long-Term Overseas Training* (WZF2012No. 126)	In use *	Procedures of the MEE
		05	2015371*Measures for the Management of Funds for Holding International Conferences in China* (CH2015 No.371)	In use *	Procedures of the MEE
		06	2004139*Regulations on the Application of Work Permits for Foreign Experts in China* (WZF 2004No.139)	In use *	Procedures of the MEE
NNSA/HQ-00-ZG-AP-011	*Guideline for Financial Resources Management*			New edition	Adminstrative Office, Department of Nuclear Facility Safety Regulation
		01	*Measures for the Budget Control of the Ministry of Environmental Protection*	In use	Procedures of the MEE
		02	*Detailed Rules for the Implementation of Central-level Project Expenditure Budget Control of the Ministry of Environmental Protection (Trial)*	In use	Procedures of the MEE

Level II Documents		Level III Documents		Status	Preparation Department
		03	*Detailed Rules for the Management of Acceptance of Departmental Budget Projects of the Ministry of Environmental Protection (Trial)*	In use	Procedures of the MEE
		04	*Interim Provisions of the Ministry of Environmental Protection on Results Management of Departmental Budget Projects*	In use	Procedures of the MEE
		05	*Interim Provisions of the Ministry of Environmental Protection on the Management of Commission Business Expenses for Financial Appropriation Projects*	In use	Procedures of the MEE
		06	*Regulations of the Ministry of Environmental Protection on the Control of Institutional Convention Funds*	In use	Procedures of the MEE
		07	*Eight Prohibitions on Further Strengthening the Control of Convention Funds*	In use	Procedures of the MEE
		08	*Notice on Further Strengthening the Control of Convention and Training Funds*	In use	Procedures of the MEE
		09	*Measures for the Control of Nuclear and Radiation Safety Regulation Project Funds*	Draft for approval	Adminstrative Office, Department of Nuclear Facility Safety Regulation
		10	*Measures for the Control of Nuclear and Radiation Safety Regulation Project Budget*	Draft for approval	Adminstrative Office, Department of Nuclear Facility Safety Regulation
		11	*Measures for the Control of Nuclear and Radiation Safety Technical Review Project Funds*	Draft for approval	Adminstrative Office, Department of Nuclear Facility Safety Regulation
NNSA/HQ-00-ZG-AP-012	*Guideline for Scientific Research Management of Nuclear and Radiation Safety*			Newly added	Division of Policy and Technology, Department of Nuclear Facility Safety Regulation
		01	*Measures for the Management of Scientific Research*	Draft for	Division of Policy and

Level II Documents		Level III Documents		Status	Preparation Department
			Projects of Nuclear and Radiation Safety Regulation	approval	Technology, Department of Nuclear Facility Safety Regulation
		02	*Measures for the Administration of Mandated Projects*	In use	Nuclear and Radiation Safety Center
		03	*Regulations on Management of Mandated Project Documents*	In use	Nuclear and Radiation Safety Center
NNSA/HQ-00-ZG-AP-013	*Guideline for Assessment and Improvement*			Newly added	Adminstrative Office, Department of Nuclear Facility Safety Regulation
		01	*Measures for the Management of Government Affairs Supervision and inspection*	In use	Adminstrative Office, Department of Nuclear Facility Safety Regulation
		02	*Measures for the Management of Internal Supervision and inspection*	Draft for approval	Adminstrative Office, Department of Nuclear Facility Safety Regulation
		03	*Procedures for Internal Audits of the Ministry of Environmental Protection*	In use	Adminstrative Office, Department of Nuclear Facility Safety Regulation
		04	*Interim Measures for the Management of Budget Performance of the Ministry of Environmental Protection*	In use	Adminstrative Office, Department of Nuclear Facility Safety Regulation
Guideline for Business Management		**Detailed Rules**		**Status**	**Preparation Department**
NNSA/HQ-00-FG-MP-001	*Guideline for the Preparation and Revision of Nuclear and Radiation Safety Laws and Regulations*			Newly added	Division of Policy and Technology, Department of Nuclear Facility Safety Regulation
		01	*Procedures for the Formulation of Nuclear and Radiation Safety Rules*	Draft for approval	Division of Policy and Technology, Department of Nuclear Facility Safety Regulation

Level II Documents		Level III Documents		Status	Preparation Department
		02	*Procedures for the Formulation of Nuclear and Radiation Safety Guideline*	Draft for approval	Division of Policy and Technology, Department of Nuclear Facility Safety Regulation
NNSA/HQ-00-SP-MP-002	*Guideline for Administrative Approval and Licensing Management of Nuclear and Radiation Safety*			Newly added	Adminstrative Office, Department of Nuclear Facility Safety Regulation
		01	*Measures for Comprehensive Office Management of Administrative Examination and Approval*	In use	Procedures of the MEE
		02	*Procedures on Administrative Review and Response to Suits by office of the Ministry of Environmental Protection*	In use	Procedures of the MEE
		03	*Some Provisions on Disposal of Administrative Review Document by Organs of the Ministry of Environmental Protection*	In use	Procedures of the MEE
		04	*Measures for the Management of Administrative Examination and Approval of Nuclear and Radiation Safety Regulation*	Draft for approval	Adminstrative Office, Department of Nuclear Facility Safety Regulation
		05	*Detailed Working Rules for the Review of Examination and Approval Items of Nuclear Power Plant and Research Reactor Licenses*	In use	Division of Comprehensive affairs, Department of Nuclear Power Safety Regulation
		06	*Detailed Working Rules for the Examination, Approval and Review of Civil Nuclear Facilities (Nuclear Fuel Cycle, Radioactive Waste Disposal Facilities) for Siting, Construction, Fuel Loading, Operation, Decommissioning and Other Activities*	In use	Division of Nuclear Fuel and Division of Radioactive waste, Department of Radiation Source Safety Regulation
		07	*Detailed Working Rules for the Examination of the Licenses of the Organizations Producing*	In use	Division of Nuclear Technology, Department of Radiation Source

Level II Documents		Level III Documents		Status	Preparation Department
			Radioisotopes (Except for Short Half-life Radiopharmaceuticals for Private Use), Selling and Using Class-I Radioactive Sources (Except for Class-I Radioactive Sources for Medical Use), and Selling and Using Class-I Radiation-emitting devices		Safety Regulation
		08	*Detailed Working Rules for the Examination of Import and Export of Radioisotopes Included in the Catalogue of Import and Export Restrictions*	In use	Division of Nuclear Technology, Department of Radiation Source Safety Regulation
		09	*Detailed Working Rules for the Licensing and Examination of Establishing Organizations Specialized in Solid Radioactive Waste Storage and Disposal*	In use	Division of Radioactive waste, Department of Radiation Source Safety Regulation
		10	*Detailed Working Rules for the Examination, Approval and Review of EIA of Construction Projects (Nuclear Fuel Cycle Facilities, Radioactive Waste Treatment and Disposal Facilities, Uranium Mining and Milling Electromagnetism and Nuclear Technology Utilization) Performed by the Ministry of Environmental Protection*	In use	Division of Comprehensive affairs, Department of Radiation Source Safety Regulation
		11	*Detailed Working Rules for the Examination and Approval of Radioisotopes Tracing Experiments in the Field that May Cause Inter-provincial Environmental Impact*	In use	Division of Nuclear Technology, Department of Radiation Source Safety Regulation
		12	*Detailed Working Rules for the Examination of*	In use	Division of Nuclear Fuel,

Level II Documents		Level III Documents		Status	Preparation Department
			Approval Letter for Design of Class-I Radioactive material Casks		Department of Radiation Source Safety Regulation
		13	*Detailed Working Rules for the Approval and Examination of Manufacturing License of Class-I Radioactive material Casks*	In use	Division of Nuclear Fuel, Department of Radiation Source Safety Regulation
		14	*Detailed Working Rules for the Approval and Examination of Class-I Radioactive material Casks Manufactured by Overseas Organizations*	In use	Division of Nuclear Fuel, Department of Radiation Source Safety Regulation
		15	*Detailed Working Rules for the Approval and Examination of Nuclear and Radiation Safety Analysis Report on Class-I Radioactive material Transportation*	In use	Division of Nuclear Fuel, Department of Radiation Source Safety Regulation
		16	*Detailed Working Rules for the Approval and Examination of Civil Nuclear Facility Decommissioning*	Under formulation	Division of Radioactive waste, Department of Radiation Source Safety Regulation
		17	*Procedures for the Examination and Approval of Application for the Licenses for Design, Manufacture, Installation and NDT of Civil Nuclear Safety Equipment*	In use	Division of Nuclear Safety Equipment, Department of Nuclear Facility Safety Regulation
		18	*Procedures for the Examination and Approval of Application for the Change of Design, Manufacture, Installation and NDT Licenses of Civil Nuclear Safety Equipment*	In use	Division of Nuclear Safety Equipment, Department of Nuclear Facility Safety Regulation
		19	*Procedures for the Examination and Approval of Application for the Renewal of Design, Manufacture, Installation and NDT Licenses of Civil Nuclear Safety Equipment*	In use	Division of Nuclear Safety Equipment, Department of Nuclear Facility Safety Regulation

Level II Documents		Level III Documents		Status	Preparation Department
		20	*Detailed Working Rules for the Approval and Examination of EIA Documents for Nuclear Power Plants and Research Reactors*	In use	Division of Comprehensive affairs, Department of Nuclear Power Safety Regulation
		21	*Format and Content of Review Comments on Nuclear Power Plant Site*	Under formulation	Division of Comprehensive affairs, Department of Nuclear Power Safety Regulation
		22	*Format and Content of Nuclear Power Plant Construction License*	Under formulation	Division of Comprehensive affairs, Department of Nuclear Power Safety Regulation
		23	*Format and Content of Nuclear Power Plant Operating License*	Under formulation	Division of Comprehensive affairs, Department of Nuclear Power Safety Regulation
		24	*Format and Content of the Approval for EIA Documents of Nuclear Power Plants*	Under formulation	Division I of Nuclear Power, Department of Nuclear Power Safety Regulation
		25	*Procedures for the Independent Verification and Calculation Management of Nuclear Power Plant Safety Review*	Under formulation	Division III of Nuclear Power, Department of Nuclear Power Safety Regulation
		26	*Procedures for the Verification Management of Nuclear Power Plant Safety Review Tests*	Under formulation	Division III of Nuclear Power, Department of Nuclear Power Safety Regulation
		27	*Procedures for Evaluation Management of Computer Software for Nuclear Power Plant Safety Analysis*	In use	Division III of Nuclear Power, Department of Nuclear Power Safety Regulation
NNSA/HQ-00-JD-MP-003	*Guideline for Nuclear and Radiation Safety Regulatory Inspection*			In use	Division of Comprehensive affairs, Department of Nuclear Power Safety Regulation
		01	*Procedures for the Management of Nuclear Facility and Nuclear Safety Regulatory Inspection*	In use	Department of Nuclear Power Safety Regulation
		02	*Procedures for the Management of Nuclear Power Plant Refueling Inspection*	In use	Department of Nuclear Power Safety Regulation

Level II Documents		Level III Documents		Status	Preparation Department
		03	*Procedures for the Management of Nuclear Facility Control Point Review and Release*	In use	Department of Nuclear Power Safety Regulation
		04	*Three-simultaneityInspection Procedures for Environmental Protection Facilities in Nuclear Power Plants*	In use	Department of Nuclear Power Safety Regulation
		05	*Inspection and Management Requirements for Nonconformities in Manufacturing Phase of Civil Nuclear Safety Equipment*	In use	Division of Nuclear Safety Equipment, Department of Nuclear Facility Safety Regulation
NNSA/HQ-00-FG-MP-004	*Guideline for Preparation and Revision of Nuclear and Radiation Safety Standards*			Newly added	Division of Policy and Technology, Department of Nuclear Facility Safety Regulation
		01	*Procedures for the Formulation of Nuclear and Radiation Safety Standards*	Draft for approval	Division of Policy and Technology, Department of Nuclear Facility Safety Regulation
		02	*Procedures for the Management of Nuclear Power Standard Accreditation in Energy Industry Related to Nuclear Safety*	Newly added	Division of Policy and Technology, Department of Nuclear Facility Safety Regulation
NNSA/HQ-00-JD-MP-005	*Guideline for Administrative Law Enforcement of Nuclear and Radiation Safety*			Newly added	Division of Policy and Technology, Department of Nuclear Facility Safety Regulation
		01	*Procedures for Administrative Penalties of Nuclear and Radiation Safety*	Under formulation	Division of Policy and Technology, Department of Nuclear Facility Safety Regulation
NNSA/HQ-00-JC-MP-006	*Guideline for National Radiation*			Newly	Division of Radiation

Level II Documents		Level III Documents		Status	Preparation Department
	Monitoring			added	Monitoring and Emergency, Department of Nuclear Facility Safety Regulation
		01	*Monitoring Scheme for National Radiation environmental*	In use	Division of Radiation Monitoring and Emergency, Department of Nuclear Facility Safety Regulation
		02	*Nuclear Accident Emergency Plan of The Ministry of Environmental Protection (NNSA)* and Implementation Procedures for Nuclear Accident Radiation environmental Emergency and Monitoring	In use	Division of Radiation Monitoring and Emergency, Department of Nuclear Facility Safety Regulation
		03	*Radiation Accident Emergency Plan of The Ministry of Environmental Protection (NNSA)* and Implementation Procedures for Radiation Accident Radiation environmental Emergency and Monitoring	In use	Division of Radiation Monitoring and Emergency, Department of Nuclear Facility Safety Regulation
		04	*Radiation Emergency Plan for the Northeast Frontier and Its Surrounding Areas of the Ministry of Environmental Protection (NNSA)* and Implementation Procedures for Radiation Emergency of the Northeast Frontier and Its Surrounding Areas	In use	Division of Radiation Monitoring and Emergency, Department of Nuclear Facility Safety Regulation
		05	*Implementation Rules for Data Management of National Radiation environmental Monitoring Network*	In use	Division of Radiation Monitoring and Emergency, Department of Nuclear Facility Safety Regulation
		06	*Implementation Rules for the Real-time Release of Automatic Monitoring Data of the National Radiation environmental Monitoring Network*	In use	Division of Radiation Monitoring and Emergency, Department of Nuclear Facility Safety Regulation
NNSA/HQ-00-XG-MP-007	*Guideline for Public Communication on Nuclear and Radiation Safety*			Newly added	Division of Nuclear Safety Coordination, Department of Nuclear Facility Safety

Level II Documents		Level III Documents		Status	Preparation Department
					Regulation
		01	*Environmental Information Disclosure Measures*	In use	Procedures of the MEE
		02	*Measures for Public Participation in Environmental Protection*	In use	Procedures of the MEE
		03	*Regulations of the Ministry of Environmental Protection on Disclosure of Government Information upon Application*	In use	Procedures of the MEE
		04	*Measures for the Implementation of Information Disclosure by Environmental Protection Public Utilities*	In use	Procedures of the MEE
		05	*Measures for Press Management of the Ministry of Environmental Protection*	In use	Procedures of the MEE
		06	*Measures for Guidance on Publicity and Education of the Ministry of Environmental Protection*	In use	Procedures of the MEE
		07	*Measures for Complaint Letters and Visits on Environment*	In use	Procedures of the MEE
		08	*Nuclear and Radiation Safety Regulation Information Disclosure Scheme*	Under revision	Division of Radiation Monitoring and Emergency, Department of Nuclear Facility Safety Regulation
		09	*Public Opinion Monitoring and Reporting Procedures for Nuclear and Radiation Safety of the Ministry of Environmental Protection (NNSA)*	In use	Procedures of the MEE
		10	*Public Opinion Monitoring and Response Plan for Nuclear and Radiation Safety of the Ministry of Environmental Protection (NNSA)*	In use	Procedures of the MEE
NNSA/HQ-00-ZG-MP-008	*Guideline for Experience Feedback on Nuclear and Radiation Safety*			Newly added	Division of Experience Feedback, Department of Nuclear Power Safety Regulation

Level II Documents		Level III Documents		Status	Preparation Department
		01	*Measures for the Management of Experience Feedback of Nuclear Power Plants*	In use	Division of Experience Feedback, Department of Nuclear Power Safety Regulation
		02	*Guideline for Experience Feedback of Nuclear Power Plants*	In use	Division of Experience Feedback, Department of Nuclear Power Safety Regulation
		03	*Procedures for Collection and Release of Experience Feedback Information of Nuclear Power Plants*	In use	Division of Experience Feedback, Department of Nuclear Power Safety Regulation
		04	*Procedures for User Management of the Experience Feedback Platform of the NNSA*	In use	Division of Experience Feedback, Department of Nuclear Power Safety Regulation
		05	*Working Procedures for Independent Evaluation of Nuclear Power Plant Events*	Under formulation	Division of Experience Feedback, Department of Nuclear Power Safety Regulation
		06	*Procedures for Training and Communication on Experience Feedback of Nuclear Power Plants*	Under formulation	Division of Experience Feedback, Department of Nuclear Power Safety Regulation
		07	*Guideline for Cause Analysis of Nuclear Power Plant Events*	Under formulation	Division of Experience Feedback, Department of Nuclear Power Safety Regulation
		08	*Guideline for the Reporting of Operational Events of Nuclear Power Plants*	Under formulation	Division of Experience Feedback, Department of Nuclear Power Safety

Level II Documents		Level III Documents		Status	Preparation Department
					Regulation
		09	*Procedures for the Management of Civil Nuclear Safety Equipment Inspection Experience Feedback*	In use	Division of Nuclear Safety Equipment, Department of Nuclear Facility Safety Regulation
		10	/*Procedures for Investigation and Treatment of Radiation Events/Accidents*	Under formulation	Division of Nuclear Technology, Department of Radiation Source Safety Regulation
		11	/*Procedures for Investigation and Treatment of Nuclear Fuel Cycle Facility Events/Accidents*	Under formulation	Division of Nuclear Fuel, Department of Radiation Source Safety Regulation
NNSA/HQ-00-YJ-MP-009	*Nuclear Accident Emergency Plan*			In use	Division of Radiation Monitoring and Emergency, Department of Nuclear Facility Safety Regulation
		01	Supporting procedures	In use	Division of Radiation Monitoring and Emergency, Department of Nuclear Facility Safety Regulation
NNSA/HQ-00-YJ-MP-010	*Radiation Accident Emergency Plan*			In use	Division of Radiation Monitoring and Emergency, Department of Nuclear Facility Safety Regulation
		01	Supporting procedures	In use	Division of Radiation Monitoring and Emergency, Department of Nuclear Facility Safety Regulation
NNSA/HQ-00-XX-MP-011	*Guideline for Nuclear Material Accountancy and Physical*			Newly added	Division of Radiation Monitoring and Emergency,

Level II Documents		Level III Documents		Status	Preparation Department
	Protection				Department of Nuclear Facility Safety Regulation
		01	Supporting procedures	Newly added	Division of Radiation Monitoring and Emergency, Department of Nuclear Facility Safety Regulation
NNSA/HQ-00-PZ-MP-012	*Guideline for Business Training of Nuclear and Radiation Safety Regulators*			Newly added	Division of Personnel Qualification, Department of Nuclear Facility Safety Regulation
		01	Supporting procedures	Newly added	Division of Personnel Qualification, Department of Nuclear Facility Safety Regulation
NNSA/HQ-00-PZ-MP-013	*Guideline for Qualification Management of Special Personnel for Nuclear Safety*			Newly added	Division of Personnel Qualification, Department of Nuclear Facility Safety Regulation
		01	*Regulatory Inspection Procedures for the Management of Qualification of Special Technologists for Civil Nuclear Safety Equipment*	Newly added	Division of Personnel Qualification, Department of Nuclear Facility Safety Regulation
		02	*Procedures for the Examination and Approval of Qualification of Special Technologists for Civil Nuclear Safety Equipment*	Newly added	Division of Personnel Qualification, Department of Nuclear Facility Safety Regulation
		03	*Regulatory Inspection Procedures for License*	Newly	Division of Personnel

Level II Documents		Level III Documents		Status	Preparation Department
			Examination of Nuclear Reactor Operators for Civil Nuclear Facilities	added	Qualification, Department of Nuclear Facility Safety Regulation
		04	*Regulatory Inspection Procedures for License Approval of Nuclear Reactor Operators for Civil Nuclear Facilities*	Newly added	Division of Personnel Qualification, Department of Nuclear Facility Safety Regulation
		05	*Procedures for Registration Management and Examination of Registered Nuclear Safety Engineers*	*Proposed to be revised*	Division of Personnel Qualification, Department of Nuclear Facility Safety Regulation
		06	*Procedures for Confidentiality Management of National Unified Examination for Registered Nuclear Safety Engineer Vocational Qualification*	In use	Division of Personnel Qualification, Department of Nuclear Facility Safety Regulation
General Technical Management Programs		**/Working/Implementation Procedures**		**Status**	**Preparation Department**
NNSA/HQ-01-JD-PP-001	*Regulatory Inspection Program for Nuclear Power Plant Construction Phase*			In use	Division II of Nuclear Power, Department of Nuclear Power Safety Regulation
		01	Supporting procedures	Under formulation	Division II of Nuclear Power, Department of Nuclear Power Safety Regulation
NNSA/HQ-01-JD-PP-002	*Regulatory Inspection Program for Nuclear Power Plant Commissioning Phase*			In use	Division I of Nuclear Power, Department of Nuclear Power Safety Regulation
		01	Supporting procedures	Under	Division I of Nuclear Power,

Level II Documents		Level III Documents		Status	Preparation Department
				formulation	Department of Nuclear Power Safety Regulation
NNSA/HQ-01-JD-PP-003	*Regulatory Inspection Program for Nuclear Power Plant Operation Phase*			In use	Division III of Nuclear Power, Department of Nuclear Power Safety Regulation
		01	Supporting procedures	Under formulation	Division III of Nuclear Power, Department of Nuclear Power Safety Regulation
		02	*Nuclear Safety Inspection Program for Activities Concerning the Renewal of Operating License for Unit 1 of Qinshan Nuclear Power Plant*	In use	Division III of Nuclear Power, Department of Nuclear Power Safety Regulation
NNSA/HQ-01-SP-PP-004	*Program for Standard Review of Nuclear Power Plant Safety Analysis Report*			In use	Department of Nuclear Power Safety Regulation
		01	*Principles for Safety Review of Improved Second Generation Nuclear Power Projects*	In use	Department of Nuclear Power Safety Regulation
		02	*Principles for Safety Review of Demonstration Project of High Temperature Gas-cooled Reactor Nuclear Power Plant*	In use	Division of Reactor, Department of Nuclear Power Safety Regulation
		03	*Guideline for Review of the Renewal of Qinshan NPP Operating License*	In use	Division III of Nuclear Power, Department of Nuclear Power Safety Regulation
		04	*Technical Insights on Several Review issues of the CAP 1400 Demonstration Project*	In use	Department of Nuclear Power Safety Regulation
		05	*General Technical Requirements for Improvement Activities of Nuclear Power Plants after Fukushima Nuclear Accidents (Trial)*	In use	Department of Nuclear Power Safety Regulation
		06	*Principles for Nuclear Safety Review of HPR1000 Projects*	In use	Division II of Nuclear Power, Department of Nuclear Power Safety Regulation
		07	*Format and Content of Nuclear Power Plant*	Under	Division II of Nuclear Power,

Level II Documents		Level III Documents		Status	Preparation Department
			Safety Evaluation Reports	formulation	Department of Nuclear Power Safety Regulation
		08	*Principles for Safety Review of Small PWR Nuclear Power Plants (Trial)*	In use	Division of Reactor, Department of Nuclear Power Safety Regulation
		09	*Principles for Safety Review of Floating Nuclear Power Plant Demonstration Project*	Under formulation	Division of Reactor, Department of Nuclear Power Safety Regulation
NNSA/HQ-02-JD-PP-005	*Inspection Program for Nuclear Safety of Research Reactors (Operation Phase)*			In use	Division of Reactor, Department of Nuclear Power Safety Regulation
		01	Supporting procedures	Under formulation	Division of Reactor, Department of Nuclear Power Safety Regulation
		02	*Principles for Safety Review of Small PWR Nuclear Power Plants (Trial)*	In use	Division of Reactor, Department of Nuclear Power Safety Regulation
		03	*Principles for Safety Review of Floating Nuclear Power Plant Demonstration Project*	Under formulation	Division of Reactor, Department of Nuclear Power Safety Regulation
NNSA/HQ-01-SP-PP-006	*Standard Review and Evaluation Program for EIA Documents of Nuclear Facilities*			In use	Division I of Nuclear Power, Department of Nuclear Power Safety Regulation
NNSA/HQ-06-SP-PP-007	*Review Program for Licensing of Civil Nuclear Safety Equipment*			Newly added	Division of Nuclear Safety Equipment, Department of Nuclear Facility Safety Regulation
		01	Supporting procedures	Under formulati	Division of Nuclear Safety Equipment, Department of

Level II Documents		Level III Documents		Status	Preparation Department
				on	Nuclear Facility Safety Regulation
NNSA/HQ-06-JD-PP-008	*Inspection Program for Civil Nuclear Safety Equipment*			In use	Division of Nuclear Safety Equipment, Department of Nuclear Facility Safety Regulation
		01	*Procedures for Regulatory Inspection of Civil Nuclear Safety Equipment Design Licensee and Its Activities*	In use	Division of Nuclear Safety Equipment, Department of Nuclear Facility Safety Regulation
		02	*Procedures for Regulatory Inspection of Civil Nuclear Safety Equipment Manufacturing Licensee and Its Activities*	In use	Division of Nuclear Safety Equipment, Department of Nuclear Facility Safety Regulation
		03	*Procedures for Regulatory Inspection of Civil Nuclear Safety Equipment NDT Licensee and Its Activities*	In use	Division of Nuclear Safety Equipment, Department of Nuclear Facility Safety Regulation
		04	*Procedures for the Management of Quantitative Evaluation on Civil Nuclear Safety Equipment Inspection*	In use	Division of Nuclear Safety Equipment, Department of Nuclear Facility Safety Regulation
		05	*Procedures for Social Disclosure of Reports on Civil Nuclear Safety Equipment Regulatory*	In use	Division of Nuclear Safety Equipment, Department of

Level II Documents		Level III Documents		Status	Preparation Department
			Inspection		Nuclear Facility Safety Regulation
		06	*Organization Structure and Assignment of responsibilities of Civil Nuclear Safety Equipment Inspection*	In use	Division of Nuclear Safety Equipment, Department of Nuclear Facility Safety Regulation
		07	*Procedures for the Management of Training for Inspectors of Civil Nuclear Safety Equipment*	In use	Division of Nuclear Safety Equipment, Department of Nuclear Facility Safety Regulation
		08	*Procedures for the Management of Inspection Documents of Civil Nuclear Safety Equipment*	In use	Division of Nuclear Safety Equipment, Department of Nuclear Facility Safety Regulation
		09	*Procedures for the Management of Inspection Interfaces of Civil Nuclear Safety Equipment*	In use	Division of Nuclear Safety Equipment, Department of Nuclear Facility Safety Regulation
		10	*Procedures for the Management of Project Superintendents of Civil Nuclear Safety Equipment Inspection Projects*	In use	Division of Nuclear Safety Equipment, Department of Nuclear Facility Safety Regulation
		11	*Procedures for the Management of Documents Issuance of Civil Nuclear Safety Equipment*	In use	Division of Nuclear Safety Equipment, Department of

Level II Documents		Level III Documents		Status	Preparation Department
			Inspection Projects		Nuclear Facility Safety Regulation
		12	*Procedures for the Management of Domestic On-site Inspection of Civil Nuclear Safety Equipment*	In use	Division of Nuclear Safety Equipment, Department of Nuclear Facility Safety Regulation
		13	*Procedures for the Management of Overseas On-site Inspection of Civil Nuclear Safety Equipment*	In use	Division of Nuclear Safety Equipment, Department of Nuclear Facility Safety Regulation
		14	*Reporting System for Inspection of Civil Nuclear Safety equipment*	In use	Division of Nuclear Safety Equipment, Department of Nuclear Facility Safety Regulation
			Security inspection procedures		
		01	*Procedures for Safety Inspection of Imported Civil Nuclear Safety Equipment*	In use	Division of Nuclear Safety Equipment, Department of Nuclear Facility Safety Regulation
		02	*Guideline for Declaration of Safety Inspection Documents for Imported Civil Nuclear Safety Equipment*	In use	Division of Nuclear Safety Equipment, Department of Nuclear Facility Safety Regulation
		03	*Program for Review of Unpacking Declaration*	In use	Division of Nuclear Safety

Level II Documents		Level III Documents		Status	Preparation Department
			Materials for Imported Civil Nuclear Safety Equipment		Equipment, Department of Nuclear Facility Safety Regulation
		04	*Procedures for Unpacking Witness Inspection of Imported Civil Nuclear Safety Equipment*	In use	Division of Nuclear Safety Equipment, Department of Nuclear Facility Safety Regulation
		05	*Guideline for the Management of Manufacture Supervision, Pre-shipment Inspection, Loading Supervision and Acceptance of Imported Civil Nuclear Safety Equipment*	In use	Division of Nuclear Safety Equipment, Department of Nuclear Facility Safety Regulation
		06	*Procedures for the Management of Safety Inspection Open Items of Imported Civil Nuclear Safety Equipment*	In use	Division of Nuclear Safety Equipment, Department of Nuclear Facility Safety Regulation
		07	*Measures for the Management of Submission of Summary Reports on Safety Inspection of Imported Civil Nuclear Safety Equipment*	In use	Division of Nuclear Safety Equipment, Department of Nuclear Facility Safety Regulation
		08	*Measures for the Management of Evaluation on Overseas Registration Organizations*	In use	Division of Nuclear Safety Equipment, Department of Nuclear Facility Safety Regulation
		09	*Joint Review Process for Complete Mechanical*	In use	Division of Nuclear Safety

Level II Documents		Level III Documents		Status	Preparation Department
			and Electrical Equipment		Equipment, Department of Nuclear Facility Safety Regulation
		10	*Detailed Rules for Document Management of Security Inspection Office*	In use	Division of Nuclear Safety Equipment, Department of Nuclear Facility Safety Regulation
		11	*Detailed Working Rules for Liaison Officers of Security Inspection Office*	In use	Division of Nuclear Safety Equipment, Department of Nuclear Facility Safety Regulation
		12	*Criteria for Return of Security Inspection Declaration Documents*	In use	Division of Nuclear Safety Equipment, Department of Nuclear Facility Safety Regulation
		13	*Detailed Rules for Quantitative Assessment of Annual Performance of Security Inspection Office*	In use	Division of Nuclear Safety Equipment, Department of Nuclear Facility Safety Regulation
NNSA/HQ-03-SP-PP-009	*Program for Safety Review of Uranium Enrichment Facilities*			In use	Division of Nuclear Fuel, Department of Radiation Source Safety Regulation
		01	Supporting procedures	Under formulati	Division of Nuclear Fuel, Department of Radiation Source

Level II Documents		Level III Documents		Status	Preparation Department
				on	Safety Regulation
NNSA/HQ-03-JD-PP-010	*Program for Regulatory Inspection of Nuclear Fuel Cycle Facilities*			In use	Division of Nuclear Fuel, Department of Radiation Source Safety Regulation
		01	Supporting procedures	Under formulation	Division of Nuclear Fuel, Department of Radiation Source Safety Regulation
NNSA/HQ-03-SP-PP-011	*Program for Safety Review of Uranium Fuel Element Fabrication Facilities*			In use	Division of Nuclear Fuel, Department of Radiation Source Safety Regulation
		01	Supporting procedures	Under formulation	Division of Nuclear Fuel, Department of Radiation Source Safety Regulation
NNSA/HQ-03-SP-PP-012	*Program for Safety Review of Reprocessing Facilities*			In use	Division of Nuclear Fuel, Department of Radiation Source Safety Regulation
		01	Supporting procedures	Under formulation	Division of Nuclear Fuel, Department of Radiation Source Safety Regulation
NNSA/HQ-04-SP-PP-013	*Program for Safety Review of Radioactive Waste Disposal Facilities*			Under formulation	Division of Radioactive waste,Department of Radiation Source Safety Regulation
		01	Supporting procedures	Under formulation	Division of Radioactive waste,Department of Radiation Source Safety Regulation

Level II Documents		Level III Documents		Status	Preparation Department
NNSA/HQ-04-JD-PP-014	*Regulatory Inspection Program for Radioactive Waste Disposal Facilities*			Under formulation	Division of Radioactive waste,Department of Radiation Source Safety Regulation
		01	Supporting procedures	Under formulation	Division of Radioactive waste,Department of Radiation Source Safety Regulation
NNSA/HQ-07-SP-PP-015	*Program for Safety Review of Radioactive material Transport*				Division of Nuclear Fuel, Department of Radiation Source Safety Regulation
		01	Supporting procedures	Under formulation	Division of Nuclear Fuel, Department of Radiation Source Safety Regulation
NNSA/HQ-07-JD-PP-016	*Regulatory Inspection Program for Radioactive material Transportation*				Division of Nuclear Fuel, Department of Radiation Source Safety Regulation
		01	*Regulatory Inspection Procedures for Radioactive Substance Transportation Activities*	Under formulation	Division of Nuclear Fuel, Department of Radiation Source Safety Regulation
NNSA/HQ-08-SP-PP-017	*Program for Radiation Safety Review of Nuclear Technology Application Projects*			Under formulation	Division of Nuclear Technology, Department of Radiation Source Safety Regulation
		01	Supporting procedures	Under formulation	Division of Nuclear Technology, Department of Radiation Source Safety Regulation
NNSA/HQ-10-SP-PP-018	*Program for Review of EIA*			Under	Division of Electromagnetic

Level II Documents		Level III Documents		Status	Preparation Department
	Documents of Electromagnetic Construction Projects			formulation	Mining and Milling, Department of Radiation Source Safety Regulation
		01	Supporting procedures	Under formulation	Division of Electromagnetic Mining and Milling, Department of Radiation Source Safety Regulation
NNSA/HQ-10-JD-PP-019	*Regulatory Inspection Program for Environmental Protection of Electromagnetic Construction Projects*			Under formulation	Division of Electromagnetic Mining and Milling, Department of Radiation Source Safety Regulation
		01	Supporting procedures	Under formulation	Division of Electromagnetic Mining and Milling, Department of Radiation Source Safety Regulation
NNSA/HQ-08-JD-PP-020	*Regulatory Inspection Program for Radiation Safety and Protection in Nuclear Technology Application*			In use	Division of Nuclear Technology, Department of Radiation Source Safety Regulation
		01	*Technical Procedures for Regulatory Inspection of Safety and Protection for Radioisotopes and Radiation-emitting devices*	In use	Division of Nuclear Technology, Department of Radiation Source Safety Regulation
NNSA/HQ-08-SP-PP-021	*Program for Review of EIA Documents of Nuclear Technology Application Projects*			In use	Division of Nuclear Technology, Department of Radiation Source Safety Regulation
		01	Supporting procedures	Under formulation	Division of Electromagnetic Mining and Milling, Department of Radiation Source Safety Regulation

Level II Documents		Level III Documents		Status	Preparation Department
NNSA/HQ-09-SP-PP-022	*Review Program for Environmental Impact Assessment Documents of Uranium Mining and Milling Construction Projects*			Under formulation	Division of Electromagnetic Mining and Milling, Department of Radiation Source Safety Regulation
		01	Supporting procedures	Under formulation	Division of Electromagnetic Mining and Milling, Department of Radiation Source Safety Regulation
NNSA/HQ-09-JD-PP-023	*Program for Safety Inspection of Radiation environmental in Uranium Mining and Milling*			In use	Division of Electromagnetic Mining and Milling, Department of Radiation Source Safety Regulation
Note: Level III documents marked with * are sensitive or confidential procedures and systems. When preparing the corresponding Level II documents, it is sufficient to briefly introduce the main points and procedures, and it is not appropriate to elaborate them in detail.					

Attachment (2): Reference Format of Commissioning Regulatory Inspection Program

1. Purpose

2. Scope of Application

3. Basis for Regulatory Inspection

4. Organization Structure and Assignment of Responsibilities

5. Implementation of Regulatory Inspection

5.1 Scope of Regulatory Inspection

5.2 Daily Regulatory Inspection

(1) On-site walk-downs

(2) Special subject investigation

(3) Review and tracking of abnormalities or non-conformances

(4) Review of periodic report of operating organization

(5) Regular dialogues

(6) Observer activities

5.3 Routine Nuclear Safety Inspection

5.3.1 Comprehensive/Special Inspection (Inspection Purpose, Content, Implementing Body and Frequency)

(1) Inspection of commissioning management

(2) Inspection of commissioning quality assurance

(3) Inspection of hot functional test

(4) Inspection of the safety-class digital instrument & control system

(5) Inspection of pre-service inspection

(6) Inspection of emergency preparedness

(7) Inspection of physical protection

(8) Inspection upon completion of 100% power test

5.3.2 Control Point Inspection (Inspection Purpose, Control Point Setting, Implementing Body)

(1) Primary circuit hydraulic test

(2) First fuel loading

(3) First criticality

(4) Departure from 5% rated power

(5) Departure from 50% rated power

(6) Departure from 90% rated power

5.3.3 Witness Point Inspection (Special Inspection for Commissioning Test)

(Purpose of inspection, selecting principles of inspection items, list of inspection items (W/R points), implementing body, focuses, preparation and implementation requirements. The list of W/R points for different types of reactors shall be developed separately, and items for the project of first reactor shall be developed separately.)

5.4 Non-routine Inspection

6. Inspection Procedures

(Control point regulatory inspection procedures, witness point regulatory inspection procedures, regulatory inspection procedures in important safety-related areas, routine/non-routine regulatory inspection procedures)

7. Review and Treatment of Problems Identified in Commissioning Inspection

8. Commissioning Inspection Plan, Inspection Records and Reports

(Inspection plan, inspection records, periodic inspection report, inspection report, investigation report, evaluation report, inspection summary report, implementation of regulations reporting system, etc.)

9. Management of Regulatory Inspection Program

Terms and Terminologies

Appendix:

(1) List of control point inspection and supporting regulatory inspection procedures

(2) List of witness point inspection/record confirmation and supporting regulatory inspection procedures

(3) List of important regulatory inspection areas and supporting regulatory inspection procedures

(4) List of performance test regulatory inspection items of imported civil nuclear safety equipment and supporting regulatory inspection procedures

(5) List of regulatory inspection items in commissioning phase of the first reactor

Annex (3): Reference Format of Safety Review Program

1. Purpose

2. Scope of Application

3. Basis for Review

4. Organization Structure and Assignment of Responsibilities

5. Review Principles

6. Implementation of Review Activities

6.1 Review and evaluation planning and project management

6.2 Review and evaluation methods and workflow

6.3 Recording and reporting of review and evaluation results;

7. Review Elements and Key Points

Describe the followings chapter by chapter in 5 parts according to the reviewed documents (adjusted or deleted as required):

(1) Review and evaluation content

(2) Review and evaluation interface

(3) Basis for review and evaluation

(4) Review and evaluation points

(5) Acceptance criteria

8. Management of Review and Evaluation Program

9. Terms and Terminologies

10. Annex: List of Supporting Documents for Safety Review

Note: The above framework is recommended for reference. As required, the safety review and evaluation program for nuclear facilities can be formulated separately according to different types of documents submitted for review by different nuclear facilities, such as site safety analysis report, environmental impact analysis report, safety analysis report (PSAR, FSAR), refueling safety analysis report, ten-year periodic safety review report and program documents.

Annex 2

List of Drafters and Reviewers of China Nuclear and Radiation Safety Management System Documents

1. List of Drafters for the General Principles

Cheng Jianxiu, Cao Xiaoping, Luan Haiyan, Zhang Wei, An Hongzhen, Jin Huixin, Chen Xudong, and Qiu Guosheng

2. List of Drafters of the *GuidelineGuideline and Technical Management Programs*

(1) *Organization Structure and Assignment of Responsibilities*: Wang Yanqi and Duan Hongwei

(2) *Guideline for Meeting Management*: Yang Xue and Duan Hongwei

(3) *Guideline for Document Management*: Li Jufeng and Wang Yanqi

(4) *Guideline for the Management of Records and Archives*: Yang Xue and Li Jufeng

(5) *Guideline for Procurement Control and Contract Management*: Li Xiaoyang and Wu Xiaoyan

(6) *Guideline for the Management of Internal Information Reporting:* Zhao Li

(7) *Guideline for the Integrated Management of Infrastructure and Work Environment*: Qiu Xinhua and Wu Han

(8) *Guideline for Human Resources Management*: Chen Fangqiang, Cai Chenxing, Zhang Ying and Xing Dan

(9) *Guideline for Knowledge Management and Informatization Construction*: Li Jing and Bian Yufang

(10) *Guideline for the Management of International Exchange and Cooperation and Foreign Affairs*: Zhang Qinghua

(11) *Financial Resources Management*: Wan Xia, Ma Wei and Ren Lihua

(12) *Guideline for Scientific Research Management of Nuclear and Radiation Safety*: Li Yan

(13) *Guideline for Evaluation and Improvement:* Yang Xue and Duan Hongwei

(14) *Guideline for the Preparation and Revision of Nuclear and Radiation Safety Laws and Regulations*: Li Yan

(15) *Guideline for Administrative Approval and Licensing Management of Nuclear and Radiation Safety*: Wang Yanqi, Li Jufeng and Xu Guangzhen

(16) *Guideline for Nuclear and Radiation Safety Inspection*: Yin Dejian, Sun

Guochen, Hou Wei , Yan Xiuping, Chen Ci and Li Zhongxun

(17) *Guideline for the Preparation and Revision of Nuclear and Radiation Safety Standards*: Liu Yingwei

(18) *Guideline for Administrative Law Enforcement of Nuclear and Radiation Safety*: Li Yan

(19) *Guideline for National Radiation Environmental Monitoring*: Fan Fanghui and Li Jin

(20) *Guideline for Communication with the Public on Nuclear and Radiation Safety*: Gao Yuanxun, Tong Zhou, Zhang Ying, Wang Maojie and Lu Xin

(21) *Guidance for Experience Feedback on Nuclear and Radiation Safety:* Xiao Zhi and Xu Youlong

(22) *Nuclear Accident Emergency Plan*: Yue Huiguo and Lin Quanyi

(23) *Radiation Accident Emergency Plan*: Yue Huiguo and Lin Quanyi

(24) *Guideline for Nuclear Material Accountancy and Physical Protection:* Zhang Min

(25) *Guideline for Business Training of Nuclear and Radiation Safety Regulation*: Wang Lei and Zhang Ying

(26) *Guideline for Qualification Management of Special Personnel in Nuclear Safety*: Zhang Ying and Chen Fangqiang

(27) *Inspection Program for Nuclear Power Plant Construction Phase*: Zhang Lin, Zhou Jingzhi, Wang Zhaoran, Pei Wei and Wan Binbin

(28) *Inspection Program for Nuclear Power Plant Commissioning Phase*: Feng Youcai, Lv Ailin, Hu Yanling and Chen XiaoRui

(29) *Inspection Program for Nuclear Power Plant Operation Phase*: Wei Li, Diao Jinhui, Chen Rongda and Zhang Huiyi

(30) *Program for Standard Review of Nuclear Power Plant Safety Analysis Report*: Yan Tianwen, Li Bin, Chuqibao, Cai Jianping, Wang Yuhong, etc.

(31) *Inspection Program for Nuclear Safety of Research Reactors (Operation Phase):* Zhu Lixin and Song Chenxiu

(32) *Program of Review and Evaluation for EIA Documents of Nuclear Facilities*: Mao Yuxian and Feng Youcai

(33) *Program of Review and Evaluation for Licensing of Civil Nuclear Safety Equipment*: Li Shixin, Jiang Shujie, Yin Baojuan, He Zhenyu and Zheng Ruipeng

(34) *Inspection Program for Civil Nuclear Safety Equipment*: Qin Liwei

(35) *Program of Safety Review and Evaluation for Uranium Enrichment Facilities*: Liu Yuntao

(36) *Safety Inspection Program of Nuclear Fuel Cycle Facilities*: Shilin

(37) *Program for Safety Review and Evolution of Uranium Fuel Element Fabrication Facilities*: Yang Xiaowei

(38) *Program for Safety Review and Evolution of Reprocessing Facilities*: Wang Shijun

(39) *Program for Safety Review and Evolution of Radioactive Waste Disposal Facilities*: Wei Fangxin

(40) *Inspection Program for Radioactive Waste Disposal Facilities*: Li Zengqiang

(41) *Program for Safety Review and Evolution of Radioactive Material Transport*: Pan Yuting and Zhan Lechang

(42) *Inspection Program for Radioactive Waste Transportation*: Cao Fangfang and Zhan Lechang

(43) *Program for Radiation Safety Review of Nuclear Technology Application Projects*: Wang Xiaotao

(44) *Program for Review of EIA Documents of Electromagnetic Construction Projects*: Wang Guan

(45) *Inspection Program for Environmental Protection of Electromagnetic Construction Projects*: Wang Guan

(46) *Regulatory Inspection Program for Radiation Safety and Protection in Nuclear Technology Application*: Hu Mei

(47) *Program for Safety Review and Evolution of EIA Documents of Nuclear Technology Application Projects*: Wang Xiaotao

(48) *Program for Review of EIA Documents of Uranium Mining and Milling Construction Projects*: Xie Shujun

(49) *Safety Inspection Program for Radiation Environmental in Uranium Mining and Milling*: Xie Shujun

3. List of proofreaders

Ding Yixing, Ding Zhibo, Wan Qinfang, Ma Lifeng, Ma Lei, Wang Gang, Wang Yan, Wang Xiaofeng, Fang Xianbo, Kong Xiangjin, Deng Shaogang, Deng Dong, Shen Hong, Xing Jinsong, Qu Yunhuan, Lv Hao, Lv Caixia, Zhu Pei, Liu Tianshu, Liu Longyun, Liu Le, Liu Wei, Liu Chenghua, Liu Xinhua, Sun Xingjian, Sun Hongtu, Li Xiaozhu, Li Haitao, Li Juan, Li Shuang, Li Xueqin, Li Lin, Li Bin, Li Jing, Li Jingyun, Li Rujun, Yang Yanfei, Yang Chun, Yang Yang, Yang Haifeng, Wu Di, Zou Bing, Wang Ping, Shen Wei, Shen Gang, Song Dahu, Song Fengli, Zhang Fayun, Zhang Yu, Zhang Xiuzhi, Zhang Jingjing, Zhang Ailing, Zhang Jiali, Zhang Jing, Chen

Dongliang, Shao Mingchang, Luo Mingyan, Luo Jianjun, Zhou Xiaojian, Zhou Xiaorui, Zhao Zhiguo, Zhao Guobin, Zhao Shangui, Jiang Wenhua, Gu Jianfeng, Xu Chunyan, Guo Jing, Cao Jian, Peng Hui, Dong Yiman, Jiang Yun, Wen Bingqing, Xiong Dongqing, Fan Yun and Pan Yuting.

4. List of reviewers

Ma Chenghui, Ma Hua, Wang Renke, Mao Haiyun, Ye Herui, Feng Jianping, Zhu Hong, Liu Yigang, Liu Jian, Liu Lu, Yan Tianwen, Li Dong, Li Donglin, Li Jigen, Li Guoguang, Li Jingxi, Li Zhiguo, Yang Zhangzhong, Zhang Tianzhu, Zhang Zhigang, Chen Zhongda, Chen Jianping, Luo Yun, Zhou Shirong, Zhou Qifu, Zhao Yongming, Hao Xiaofeng, Yu Jun, Chai Guohan, Chai Jianshe, Guo Yijun, Guo Jing, Kang Yufeng, Liang Shibiao, Hu Liguang, Han Wenping, Lou Hongxin and Pan Su

5. Approved by

Liu Hua, Guo Chengzhan, Tang Bo, Jiang Guang and Ren Hongyan

Annex 3

Applicable Regulations and Standards for Nuclear and Radiation Safety Regulation

3.1 National Laws

(1) Administrative License Law of the People's Republic of China

(2) Administrative Penalties Law of the People's Republic of China

(3) Emergency Response Law of the People's Republic of China

(4) Environmental Protection Law of the People's Republic of China

(5) Law of the People's Republic of China on Protection and Control of Radioactive Pollution

(6) Law of the People's Republic of China on EIA

(7) Atomic Energy Law (unavailable)

(8) Nuclear Safety Law of the People's Republic of China

(9) Law of the People's Republic of China on Prevention and Control of Occupational Diseases

3.2 Administrative Regulations

(1) Regulations on the Safety Regulation for Civilian Nuclear Installations of the People's Republic of China

(2) Emergency Management Regulations for Nuclear Accident at Nuclear Power Plant

(3) Regulations on Nuclear Materials Control of the People's Republic of China

(4) Regulations on the Supervision and Management for Civil Nuclear Safety Equipment

(5) Regulations on the Management for Transport Safety of Radioactive Materials

(6) Regulations on the Safety and Protection of Radioisotopes and Radiation-emitting Devices

(7) Regulations on the Safety Management of Radioactive Waste

3.3 Department Rules

3.3.1 General Series

(1) The HAF001 implementation rule: Application and Issuance of Safety License for Nuclear Power Plant (HAF001/01-1993)

Annex I: Issuance and Management Procedures for Operator License of Nuclear Power Plant (HAF001/01/01-1993)

(2) The HAF001 implementation rule: Safety Regulation of Nuclear Facilities (HAF001/02-1995)

Annex I: The Reporting System for Operating Organization of Nuclear Power Plant (HAF001/02/01-1995)

Annex II: The Reporting System for Operating Organization of Research Reactors (HAF001/02/02-1995)

Annex III: The Reporting System of Nuclear Fuel Cycle Facilities (HAF001/02/03-1995)

(3) The HAF001 implementation rule: Application and Issuance of Safety License for Research Reactors (HAF001/03-2006)

(4) The HAF002 implementation rule: Emergency Preparedness and Response for Operating Organization of Nuclear Power Plant (HAF002/01-1998)

(5) Code on the Safety of Nuclear Power Plant Quality Assurance (HAF003-1991)

(6) Measures for Management of the Certificates of Nuclear and Radiation Safety Inspectors (HAF004-2013)

3.3.2 Nuclear Power Plant Series

(1) Code on the Safety of Nuclear Power Plant Siting (HAF101-1991)

(2) Code on the Safety of Nuclear Power Plant Design (HAF102-2016)

(3) Code on the Safety of Nuclear Power Plant Operation (HAF103-2004)

(4) Code on the Safety of Nuclear Power Plant Operation

Annex I: Management of Refueling, Modifications and Accident Shutdown of Nuclear Power Plant (HAF103/01-1994)

3.3.3 Research Reactor Series

(1) Code on the Safety of Research Reactor Design (HAF201-1995)

(2) Code on the Safety of Research Reactor Operation (HAF202-1995)

3.3.4 Nuclear Fuel Cycle Facility Series

(1) Code on the Safety of Civil Nuclear Fuel Cycle Facilities (HAF301-1993)

3.3.5 Radioactive Waste Series

(1) Code on the Safety Inspection and Management of Radioactive Waste (HAF401-1997)

(2) Measures for Administration on License of Storage and Disposal of Radioactive Solid Waste (HAF402-2013)

3.3.6 Nuclear Material Control Series

(1) Rules for the Implementation of Regulations on Nuclear Materials Control of the People's Republic of China (HAF501/01-1990)

3.3.7 Civil Nuclear Safety Equipment Series

(1) Rules for Inspection and Management of Civil Nuclear Safety Equipment in Design, Manufacture, Installation and NDT (HAF601-2007)

(2) Rules for Qualification Management on NDT Personnel of Civil Nuclear Safety Equipment (HAF602-2007)

(3) Rules for Qualification Management of Welders and Welding Operators of Civil Nuclear Safety Equipment (HAF603-2007)

(4) Rules for Inspection and Management of Imported Civil Nuclear Safety Equipment (HAF604-2007)

3.3.8 Radioactive Material Transportation Series

(1) Measures for the Management of Safety Licensing for Transportation of Radioactive Material (HAF701-2010)

(2) Measures for the Management of Safety Inspection of Transportation of Radioactive Materials (HAF702-2016)

3.3.9 Radioisotopes and Radiation-emitting Sevice Series

(1) Measures for the Management of Safety Licensing for Radioisotopes and Radiation-emitting Devices (HAF801-2008)

(2) Measures for the Management of Safety and Protection for Radioisotopes and Radiation-emitting Devices (HAF802-2011)

3.3.10 Radiation Environmental Series

(1) Measures for the Management of Electromagnetic Radiation Environmental Protection (HAF901-1997)

3.4 Nuclear Safety Guides

3.4.1 General Series

A. Nuclear Accident Emergency Response

(1) Emergency Preparedness and Response of Nuclear Power Plant Operating Organizations (HAD002/01-2010)

(2) Emergency Preparedness of Local Government for Nuclear Power Plant (HAD002/02-1990)

(3) Interfering Principles and Levels for Public Protection During the Emergency of Nuclear Accidental Radiation (HAD002/03-1991)

(4) Derived Intervention Level of Public Protection During the Emergency of Nuclear Accident Radiation (HAD002/04-1991)

(5) Medical Emergency Preparedness and Response for Nuclear Accidents (HAD002/05-1992)

(6) Emergency Plan and Preparedness for Research Reactors (HAD002/06-1991)

(7) Emergency Preparedness and Response for Operating Organization of Nuclear Fuel Cycle Facilities (HAD002/07-2010)

B. Quality Assurance of Nuclear Power Plant

(1) Establishing the Quality Assurance Program for Nuclear Power Plants (HAD003/01-1988)

(2) Quality Assurance Organization for Nuclear Power Plants (HAD003/02-1989)

(3) Quality Assurance in the Procurement of Items and Service for Nuclear Power Plants (HAD003/03-1986)

(4) Quality Assurance Record System for Nuclear Power Plants (HAD003/04-1986)

(5) Quality Assurance Audit for Nuclear Power Plants (HAD003/05-1988)

(6) Quality Assurance in the Design of Nuclear Power Plants (HAD003/06-1986)

(7) Quality Assurance during the Construction of Nuclear Power Plants (HAD003/07-1987)

(8) Quality Assurance in the Manufacturing of Items for Nuclear Power Plant (HAD003/08-1986)

(9) Quality Assurance during Commissioning and Operation of Nuclear Power Plants (HAD003/09-1988)

(10) Quality Assurance in the Procurement, Design and Manufacture of Nuclear

Fuel Assemblies (HAD003/10-1989)

3.4.2 Nuclear Power Plant Series

A. Nuclear Power Plant Siting

(1) Earthquakes in Relation to Nuclear Power Plant Siting (HAD101/01-1994)
2HAD101/02-1987

(2) Atmospheric Dispersion in Nuclear Power Plant Siting (HAD101/02-1987)

(3) Site Selection and Evaluation for Nuclear Power Plant with Respect to Population Distribution (HAD101/03-1987)

(4) External Man-induced Events in Relation to Nuclear Power Plant Siting (HAD101/04-1989)

(5) Hydrological Dispersion of Radioactive Material in Relation to Nuclear Power Plant Sitting (HAD101/05-1991)

(6) Relationship between Nuclear Power Plant Sitting with Hydrogeological Aspects (HAD101/06-1991)

(7) Site Survey for Nuclear Power Plants (HAD101/07-1989)

(8) Determination of Design Basis Floods for Nuclear Power Plants on River Sites (HAD101/08-1989)

(9) Determination of Design Basis Floods for Nuclear Power Plants on Coastal Sites (HAD101/09-1990)

(10) Extreme Meteorological Events in Nuclear Power Plant Sitting (Excluding Tropical Cyclone) (HAD101/10-1991)

(11) Design Basis of Tropical Cyclone for Nuclear Power Plants (HAD101/11-1991)

(12) Safety Aspects of the Foundation of Nuclear Power Plants (HAD101/12-1990)

B. Nuclear Power Plant Design

(1) General Design Safety Principles for Nuclear Power Plants (HAD102/01-1989)

(2) Seismic Design and Qualification of Nuclear Power Plants (HAD102/02-1996)

(3) Safety Functions and Component Classification for BWR, PWR, and Pressure Tube Reactor (HAD102/03-1986)

(4) Protection against Internally Generated Missiles and Their Secondary Effects in Nuclear Power Plants (HAD102/04-1986)

(5) External Man-induced Events in Relation to Nuclear Power Plant Design (HAD102/05-1989)

(6) Design of the Reactor Containment Systems in Nuclear Power Plants (HAD102/06-1990)

(7) Design of Reactor Core Safety in Nuclear Power Plants (HAD102/07-1989)

(8) Reactor Coolant Systems and Their Related Systems in Nuclear Power Plants (HAD102/08-1989)

(9) Ultimate Heat Sink and Directly Associated Heat Transport Systems of Nuclear Power Plants (HAD102/09-1987)

(10) Protection System and Related Facilities in Nuclear Power Plants (HAD102/10-1988)

(11) Fire Protection in Nuclear Power Plants (HAD102/11-1996)

(12) Design of Radiation Protection for Nuclear Power Plants (HAD102/12-1990)

(13) Emergency Power Systems of Nuclear Power Plants (HAD102/13-1996)

(14) Safety-related Instrumentation and Control Systems of Nuclear Power Plants (HAD102/14-1988)

(15) Fuel Handling and Storage System Design of Nuclear Power Plants (HAD102/15-2007)

(16) Computer Based Systems Software Important to Safety in Nuclear Power Plants (HAD102/16-2004)

(17) Safety Assessment and Verification of Nuclear Power Plants (HAD102/17-2006)

C. Nuclear Power Plant Operation

(1) Operational Limits, Conditions and Procedures of Nuclear Power Plant (HAD103/01-2004)

(2) Commissioning Procedures of Nuclear Power Plants (HAD103/02-1987)

(3) Core and Fuel Management of Nuclear Power Plants (HAD103/03-1989)

(4) Radiation Protection during Operation of Nuclear Power Plants (HAD103/04-1990)

(5) Recruitment, Training and Qualification of Personnel for Nuclear Power Plants (HAD103/05-2013)

(6) Organization and Safe Operation Management of Nuclear Power Plant Operating Organizations (HAD103/06-2006)

(7) In-service Inspection of Nuclear Power Plants (HAD103/07-1988)

(8) Maintenance of Nuclear Power Plants (HAD103/08-1993)

(9) Surveillance of Items Important to Safety in Nuclear Power Plants (HAD103/09-1993)

(10) Fire Protection Safety of Nuclear Power Plant Operation (HAD103/10-2004)

(11) Periodic Safety Review of Nuclear Power Plants (HAD103/11-2006)

(12) Ageing Management of Nuclear Power Plants (HAD 103/12-2012)

3.4.3 Research Reactor Series

A. Research Reactor Design

(1) Format and Content of Research Reactor Safety Analysis Report (HAD201/01-1996)

B. Research Reactor Operation

(1) Operation Management of Research Reactor (HAD202/01-1989)

(2) Operation and Experimental Management of Criticality Facility (HAD202/02-1989)

(3) Application and Modification of Research Reactors (HAD202/03-1996)

(4) Decommissioning of Research Reactors and Criticality Facility (HAD202/04-1992)

(5) Commissioning of Research Reactor (HAD 202/05-2010)

(6) Maintenance, Periodic Test and Inspection of Research Reactors (HAD 202/06-2010)

(7) Research Reactor Core Management and Fuel Handling (HAD202/07-2012)

(8) Periodic Safety Review of Research Reactors (HAD202/-2017)

(9) Long-term Shutdown Safety Management of Research Reactors (HAD202/09-2017)

3.4.4 Non-reactor Nuclear Fuel Cycle Facility Series

(1) Standard Format and Content of Safety Analysis Report of Uranium Fuel Processing Facility (HAD301/01-1991)

(2) Design of Spent Fuel Storage Facilities (HAD301/02-1998)

(3) Operation of Spent Fuel Storage Facilities (HAD301/03-1998)

(4) Safety Evaluation of Spent Fuel Storage Facilities (HAD301/04-1998)

3.4.5 Radioactive Waste Management Series

(1) Management of Radioactive Effluents and Wastes in Nuclear Power Plants

(HAD401/01-1990)

(2) Design of Radioactive Waste Management System of NPP (HAD401/02-1997)

(3) Design and Operation of Incinerators of Radioactive Waste (HAD401/03-1997)

(4) Classification of Radioactive Waste (HAD401/04-1998)

(5) Siting for Near Surface Disposal Site of Radioactive Waste (HAD401/05-1998)

(6) Sitting for Geological Disposal Facility of High-level Radioactive Wastes (HAD401/06-2013)

(7) Decommissioning of Gamma-ray Irradiation Facility (HAD 401/07-2013)

(8) Minimization of Radioactive Waste in Nuclear Facilities (HAD 401/08-2016)

(9) Technical Specifications on Siting, Design and Building of Storage for Radioactive Waste Used by Nuclear Facilities (Trial) (HAD4XX-2004)

3.4.6 Nuclear Material Control Series

(1) Nuclear Material Accountancy in Low Enriched Uranium Conversion and Component Manufacturer (HAD501/01-2008)

(2) Physical Protection of Nuclear Installations (Trial) (HAD501/02-2018)

(3) Surrounding Intrusion Alarm System of Nuclear Installations (HAD501/03-2005)

(4) Access Control of Nuclear Installations (HAD501/04-2008)

(5) Physical Protection of Nuclear Material Transportation (HAD501/05-2008)

(6) Standard Format and Content of Physical Protection of Nuclear Installations, Nuclear Material Accountancy and Control Safety Analysis Report (HAD501/06-2008)

(7) Nuclear Material Accountancy of Nuclear Power Plants (HAD501/07-2008)

3.4.7 Civil Nuclear Safety Equipment Regulation Series

(1) Manufacturing of Mock-upof Civil Nuclear Safety Mechanical Equipment (Trial) (HAD601/01-2013)

(2) Technical Conditions for Organizations Applying for Civil Nuclear Safety Equipment Installation License (Trial) (HAD601/02-2013)

3.4.8 Radioactive material Transportation Series

(1) Standard Format and Content of Safety Assessment (Analysis) Report for Design of Transport Cask of Radioactive material (HAD701/01-2010)

(2) Standard Form and Contents of Nuclear and Radiation Safety Analysis Report for Transportation of Radioactive material (HAD701/02-2014)

3.4.9 Radioisotopes and Radiation-emitting Device Regulation Series

(1) Requirements for the Safety Prevention System of Urban Radioactive Waste Bank (HAD802/01-2017)

3.5 Nuclear and Radiation Safety Standards

S/N	Standard Number	Title
	Part 0: General Series	
1	GB 15847-1995	Dosimetry for Criticality Accidents
2	GB/T 17680.1-2008	Criteria for Emergency Planning and Preparedness for Nuclear Power Plants - Part 1: The Dividing of Emergency Planning Zones
3	GB/T 17680.2-1999	Criteria for Emergency Planning and Preparedness for Nuclear Power Plants - Off-site Emergency Functions and Organization
4	GB/T 17680.3-1999	Criteria for Emergency Planning and Preparedness for Nuclear Power Plants - Functional and Characteristics of Off-site Emergency Facilities
5	GB/T 17680.4-1999	Criteria for Emergency Planning and Preparedness for Nuclear Power Plants - The Off-site Emergency Planning and Implementing Procedures
6	GB/T 17680.5-2008	Criteria for Emergency Planning and Preparedness for Nuclear Power Plants - Part 5: Maintenance of Off-site Emergency Response Capabilities
7	GB/T 17680.6-2003	Criteria for Emergency Planning and Preparedness for Nuclear Power Plants - On-site Emergency Response Functions and Organizations
8	GB/T 17680.7-2003	Criteria for Emergency Planning and Preparedness for Nuclear Power Plants - Functional and Characteristics of On-site Emergency Facilities
9	GB/T 17680.8-2003	Criteria for Emergency Planning and Preparedness for Nuclear Power Plants - On-site Emergency Planning and Implementing Procedures
10	GB/T 17680.9-2003	Criteria for Emergency Planning and Preparedness for Nuclear Power Plants - Part 5: Maintenance of On-site Emergency Response Capabilities
11	GB/T 17680.10-2003	Criteria for Emergency Planning and Preparedness for Nuclear Power Plants - Criteria for Emergency Radiological Field Monitoring, Sampling and Analysis Conducted by Nuclear Power Plant Operating Organizations

S/N	Standard Number	Title
12	GB/T 17680.11-2008	Criteria for Emergency Planning and Preparedness for Nuclear Power Plants - Part 11: Criteria for Off-site Radiological Assessment for Emergency Response
13	GB/T 17680.12-2008	Criteria for Emergency Planning and Preparedness for Nuclear Power Plants - Part 12: Planning, Preparation, Implementation and Evaluation of Nuclear Emergency Exercises and Drills
14	HJ 844-2017	Emergency- Related Parameters for Nuclear Fuel Cycle Facilities
15	HJ 843-2017	Emergency-related Parameters for Research Reactors
16	HJ 842-2017	Emergency-related Parameters for PWR Nuclear Power Plants
	Part 4: Radioactive Waste Series	
17	GB 11928-1989	Regulations on Interim Storage of Low- and Medium-level Solid Radioactive Wastes
18	GB 11929-2011	Regulations for Designing Storage Building of High-level Radioactive Waste Liquid
19	GB 14569.1-2011	Performance Requirements for Solidified Low-and Medium-level Radioactive Waste
		Cement Solidified Waste
20	GB 12711-1991	Safety Standard for Low- and Medium-level Solid Radioactive Waste Package
21	GB 13600-1992	Regulations for Disposal of Solid Low- and Medium-level Radioactive Waste in Rock Cavities
22	GB 14500-2002	Regulations for Radioactive Waste Management
23	GB 14569.3-1995	Performance Requirements for Solidified Low-and Medium-level Radioactive Waste
		Asphalt Solidified Waste
24	GB 16933-1997	Acceptance Criteria for Near Surface Disposal of Radioactive Waste
25	GB 9132-1988	Regulations for Shallow Ground Disposal of Low- and Medium-level Solid Radioactive Waste
26	GB 14586-1993	Technical Regulations for Environmental Management of Decommissioning of Uranium Mining and Milling Facilities
27	GB 14585-1993	Regulations for Safety Management of Radioactive Waste from Milling of Uranium and Thorium Ores
28	GB 11217-1989	The General Regulation for Monitoring Effluents at Nuclear Facilities
29	GB/T 15950-1995	General Requirements for Radiation environmental Monitoring Around Near Surface Disposal Site of Low-intermediate Solid Radioactive Waste
30	GB 11216-1989	General Requirements for Quality Assurance Program for

S/N	Standard Number	Title
		Monitoring of Effluent and Environmental Radioactivity at Nuclear Facilities
31	GB/T 14588-2009	Technical Regulations for Environmental Management of Reactor Decommissioning
32	HJ/T 5.2-1993	Guideline for Environmental Protection Regulations for Nuclear Facilities-Format and Content of Environmental Impact Reports for Shallow Ground Disposal of Solid Radioactive Waste
33	HJ/T 23-1998	Siting of Near Surface Disposal Facilities of Low-and Medium-level Radioactive Wastes
	Part 7: Transport of Radioactive Material Series	
34	GB 11806-2004	Regulations for Safe Transport of Radioactive Material
35	GB/T 15219-2009	Quality Assurance for Packaging Used in Transport of Radioactive Material
36	GB/T 17230-1998	Safe Transport of Radioactive Material Leakage Inspection of Packaging
37	GB/T 9229-1988	Leak Inspection of Contents and Radiation in Radioactive Material Packaging
	Part 8: Radioisotope and Radiation-emitting Device Series	
38	GB 10252-2009	Regulations for Radiation Protection and Safety of Gamma-ray Irradiation
39	GB 11930-2010	Radiation Protection Regulations for Handling Unsealed Sources
40	GB 14052-1993	Radiation Safety Performance Requirements for Isotope Meters Installed on Equipment
41	GB 15849-1995	Sealed Radioactive Sources - Leakage Inspection Methods
42	GB 4075-2009	Sealed Radioactive Sources - General Requirements and Classification
43	GB 5172-1985	The Rule for Radiation Protection of Particle Accelerator
44	HJ 785-2016	Technical Standard of Radiation Safety for Industrial CT of Electronic Linear Accelerator
	Part 9: Radiation Environmental Series	
45	GB 18871-2002	Basic Standards for Protection Against Ionizing Radiation and the Safety of Radioactive Sources
46	GB 8702-2014	Controlling Limits for Electromagnetic Environment
47	GB 6249-2011	Regulations for Environmental Radiation Protection of Nuclear Power Plant
48	GB 11215-1989	The General Regulations for Nuclear Radioactive Environmental Quality Assessment
49	GB 8999-1988	General Rule of Quality Assurance for Ionizing Radiation Monitoring
50	GB 12379-1990	Regulation of Monitoring for Environmental Nuclear

S/N	Standard Number	Title
		Radiation
51	HJ/T 21-1998	Sampling Requirements for Water Quality Monitoring in Nuclear Facilities
52	HJ/T 22-1998	General Rules for Sampling Airborne Radioactive Materials
53	HJ/T 61-2001	Technical Criteria for Radiation Environmental Monitoring
54	HJ/T 5.1-1993	Environmental Protection Regulation Guideline for Nuclear Facilities-Standard Format and Content of Environmental Impact Reports for Research Reactors
55	HJ10.1-2016	Guideline for Radiation Environmental Protection Management Content and Format of Environmental Impact Evaluation Document for Nuclear Technology Application Facilities
56	HJ/T 10.3-1996	Guideline on Management of Radioactive Environmental Protection-EIA Methods and Standards on Electromagnetic Radiation
57	HJ/T 10.2-1996	Guideline on Management of Radioactive Environmental Protection-Electromagnetic Radiation Monitoring Instruments and Methods
58	HJ 24-2014	Technical Guideline for EIA of Electric Power Transmission and Distribution Project
59	HJ 705-2014	Technical Regulations for Environmental Protection in Electric Power Transmission and Distribution Project for Check and Accept of Completed Project
60	HJ 681-2013	Electromagnetic Environment Monitoring Methods for AC Electric Power Transmission and Distribution Project (Trial)
61	HJ808-2016	Technical Guideline for EIA - Format and Content of Environmental Impact Report for Nuclear Power Plants
62	HJ 53-2000	Regulations for Acceptable Levels of Residual Radioactivity in Soils of Sites Considered for Release
63	GB/T 15444-1995	Regulations For Monitoring Radioactivity in Effluents from Uranium Processing and Nuclear Fuel Fabrication Facilities
64	GB/T 17567-2009	Clearance Level for Recycle and Reuse of Steel, Aluminum, Nickel and Copper from Nuclear Facilities
65	GB/T 17947-2008	Activity Measurement of Solid Materials Considered for Recycling, Reuse or Disposal as Non-radioactive Wastes
66	GB/T 23728-2009	Regulations for Radiation EIA in Uranium Mine and Mill
67	GB 27742-2011	Radionuclide Activity Concentration for Materials not Requiring Radiological Regulation
68	GB 15848-2009	Regulations for Radiation and Environmental Protection in Uranium Exploration
69	GB 20664-2006	Limitation Concentration of Natural Radioactivity in Non-ferrous Metal Ores and Concentrates Products
70	GB 23726-2009	Regulation for Radiation Environmental Monitoring in

S/N	Standard Number	Title
		Uranium Mine and Mill
71	GB 23727-2009	Regulations for Radiation and Environment Protection in Uranium Mining and Milling
72	HJ 840-2017	Analytical Methods for Micro-quality of Uranium in Environmental Samples
73	GB/T 30738-2014	Determination of Radionuclides in Marine Sediment - Gamma Spectrometry
74	GB/T 16145-1995	Gamma Spectrometry Method of Analyzing Radionuclides in Biological Samples
75	GB 11222.2-1989	Radiochemical Analysis Method of Strontium-90 in Ash of Biological Samples - Ion Exchange Method
76	GB/T 16141-1995	Analytical Method for Radionuclides by Alpha Spectrometry
77	GB/T 16698-2008	Measurement of Alpha Particle Emissivity - Large Area Proportional Counter Tube Method
78	GB/T 11743-2013	Determination of Radionuclides in Soil by Gamma Spectrometry
79	GB/T 14583-1993	Norm for the Measurement of Environmental Terrestrial Gamma Radiation Dose Rate
80	GB/T 14582-1993	Standard Methods for Radon Measurement in Environmental Air
81	GB/T 14584-1993	Sampling and Determination of Iodine -131 in Air
82	GB 11214-1989	Analytical Determination of Radium -226 in Water
83	GB 11218-1989	The Determination of Alpha Radionuclide of Radium in Water
84	GB 11224-1989	Analytical Method of Thorium in Water
85	GB 11338-1989	Analytical Method of Potassium-40 in Water
86	GB 12375-1990	Analysis Method of Tritium in Water
87	GB/T 14502-1993	Analytical Method of Nickel-63 in Water
88	GB/T 15220-1994	Analytical Method of Iron-59 in Water
89	GB/T 15221-1994	Analytical Method of Cobalt-60 in Water
90	GB/T 16140-1995	Gamma Spectrometry Method for Analysis of Radionuclides in Water
91	HJ 841-2017	Analytical Method of Iodine-131 in Water, Milk, Plants and Animal Thyroid Gland
92	HJ 816-2016	Radiochemical Analysis of Cesium-137 in Water and Ash of Biological Samples
93	HJ 815-2016	Radiochemical Analysis of Strontium-90 in Water and Ash of Biological Samples
94	HJ 814-2016	Radiochemical Analysis of Plutonium in Water and Soil Samples
95	HJ 813-2016	Analytical Method of Polonium-210 in Water

3.6 Other Regulatory Requirements Documents

(1) National Environmental Event Emergency Plan (including radiation emergencies)
(2) National Emergency Plan for Environmental Emergencies
(3) National Nuclear Emergency Plan
(4) National Policy Statement on Nuclear Safety Culture
(5) Policy Statement on Severe Accident Management of Nuclear Power Plants
(6) Policy Statement on Probabilistic Safety Analysis Technology Application in Nuclear Power Plants
(7) Design Requirements for Newly Built Nuclear Power Plants
(8) Principles for Safety Review of Improved Second Generation Nuclear Power Projects
(9) Technical Insights on Several Review issues of the CAP 1400 Demonstration Project
(10) General Technical Requirements on the Improvement of Nuclear Power Plants after Fukushima Nuclear Accident
(11) Measures for the Management of Experience Feedback in Operating Nuclear Power Plants
(12) Technical Requirements on Establisment of Nuclear Accident Emergency On-site Rapid Rescue Teams for Nuclear Power Plants of Nuclear Power Group Corporations
(13) Specific Technical Requirements on Establisment of On-site Regulatory Monitoring System for Radiation Environmental in Nuclear Power Plants
(14) Safety Classification of Research Reactors
(15) Requirements for the Nuclear Safety Management of Operator Training with Research Reactors
(16) Catalogue of Civil Nuclear Safety Equipment (First Batch)
(17) Notice on Further Clarifying the License Scope of Some Types of Civil Nuclear Safety Equipment
(18) Notice on Clarifying Several Requirements for Management of Welders and Welding Operators of Civil Nuclear Safety Equipment (HAF603)
(19) Management Requirements for Allocation of Civil Nuclear Safety Equipment
(20) Classification Principles and Basic Safety Requirements for Civil Nuclear Fuel Cycle Facilities (Trial)
(21) Classification of Radioactive Waste

(22) Classification of Radioactive Sources

(23) Classification of Radiation-emitting Devices

(24) Environmental Monitoring Management Measures

(25) Catalogue of Classification Management for EIA of Construction Projects

(26) Catalogue of Regulation of Radiation Environmental for Development and Utilization of Mineral Resources (First Batch)

(27) Format and Contents of Special Files on Radiation EIA for Exploitation and Utilization of Mineral Resources

(28) List of Electromagnetic Radiation Construction Projects and Equipment

3.7 Technical Documents

(1) Dose Assessment in Nuclear Power Plant Siting HAF J0001

(2) Anti-seismic Design of Nuclear Facilities Containing Limited Radioactive Material HAF J0002

(3) Application of Microseismic Observation in Nuclear Power Plant Siting HAF J0003

(4) Prevention and Mitigation of Groundwater Pollution Caused by Radioactive Leakage HAF J0004

(5) Research Reactor Siting HAF J0005

(6) Application Manual for Single Failure Criteria HAF J0006

(7) Safety Assessment of Nuclear Emergency Power System HAF J0007

(8) Guideline for Operating Safety Review Team HAF J0008

(9) Maintenance Manual for Systems and Components Important to Safety HAF J0009

(10) Safety Effect of Water Chemistry for Light-water Reactor HAF J0010

(11) Manual for Training, Qualification Assessment and Certificate Issuance of Quality Assurance Personnel HAF J0011

(12) Proper Selection of Quality Assurance Program for Nuclear Power Plant Items and Services HAF J0012

(13) Quality Assurance in Site Survey, Evaluation and Verification of Nuclear Power Plants HAF J0013

(14) Nuclear Safety Inspection for Implementation of Quality Assurance Program HAF J0014

(15) Technical Report on Management of Nuclear Material Accountancy in Nuclear Power Plants HAF J0015

(16) Management of Nuclear Material Accountancy in Uranium Conversion

and Component Manufacturer HAF J0016

(17) Technical Report on Management of Nuclear Material Accountancy in Research Organization Facilities HAF J0017

(18) Management of Nuclear Material Accountancy in Nuclear Fuel Reprocessing Plant of Power Reactors HAF J0018

(19) Standard Format and Content of Safety Analysis Report for Nuclear Heating Plant HAF J0019

(20) Technical Document on the Application of Nuclear Power Plant Design Safety Regulations for Nuclear Heating Plant Design HAF J0020

(21) Technical Document on the Application of Nuclear Power Plant Operation Safety Regulations for Nuclear Heating Plant Operation HAF J0021

(39) Nuclear Safeguards Terminologies HAF J0039

(40) Standard Format and Content of Safety Analysis Report for Nuclear Fuel Reprocessing Plant HAF J0040

(41) Standard Form and Content of the Application for Type B Packaging License for Fissile Radioactive Materials HAF J0041

(42) Format and Contents of Nuclear Power Plant Safety Analysis Report Chapter 18 Human Factors Engineering and Control Room HAF J0042

(43) Nuclear Event Scale Manual HAF0043

(44) Quality Assurance Manual for Instrument, Control, Electrical Equipment Installation and Commissioning of Nuclear Power Plants HAF0044

(45) Quality Assurance Classification Manual HAF J0045

(46) Safety Issues of Unplanned Shutdowns and Scrams HAF J0046

(47) Quality Assurance Manual of Safety-Related Computer Software for Nuclear Power Plants HAF J0047

(48) Evaluation of Effectiveness of Nuclear Power Plant Operation Quality Management HAF J0048

(49) Review of Internal Supervision Activities of Nuclear Power Plants HAF J0049

(50) Safety Criteria for Design of Spent Fuel Reprocessing Plants (August 1995, NNSA) HAF J0050

(51) Assumption of Potential Accidents in Spent Fuel Reprocessing Plants (August 1995, NNSA) HAF J0051

(52) Safety Criteria for Design of Spent Fuel Shutdown Pools (August 1995, NNSA) HAF J0052

(53) Guideline for Seismic Qualification Tests of Nuclear Equipment (October

1995, NNSA) HAF J0053

(54) Safety Review Program for Human Factors Engineering and Control Room of Nuclear Power Plants HAF J0054

(55) Human Factors Engineering Principles for Control Room Design of Nuclear Power Plants (October 1995, NNSA) HAF J0055

(56) Setting up Operator Support System to Improve Nuclear Power Plant Safety - Operator Support System Selection Guideline HAF J0056

(57) Quality Management Manual for Nuclear Power Plant Operation Quality Management Manual HAF J0057

(58) NDT Guideline for Post-irradiation Fuel of Water Reactors HAF J0058

(59) Safety Criteria for Siting of Low Temperature Nuclear Heating Reactors HAF J0059

(60) Safety Criteria for Radiation Protection in Operation of Low Temperature Nuclear Heating Reactors HAF J0060

(61) Safety Criteria for Emergency Preparedness for Nuclear Accidents in Low Temperature Nuclear Heating Reactors HAF J0061

(62) Safety Criteria for Radioactive Waste Management in Low Temperature Nuclear Heating Reactors HAF J0062

(63) Methods and Technologies for Decommissioning of Nuclear Facilities HAF J0063

(64) Decommissioning-related Factors of Land-based Nuclear Reactors HAF J0064

(65) Some Practical Conclusions on Re-evaluation of Source Items HAF J0065

(66) Technical Insights on Item Classification of PWR Nuclear Power Plants HAF J0066

(67) Format and Content of Safety Analysis Report for Nuclear Power Plant Feasibility Study Phase HAF J0067

(68) Methods for Ageing Control of Equipment Important to Safety in Nuclear Power Plants HAF J0068

(69) Nuclear Safety Issues of Operation of PWR Nuclear Power Plants in Low Water Level HAF J0069

(70) Development of the Preparation of Emergency Operation Procedures for Nuclear Power Plants HAF J0070

(71) Analysis and Evaluation of Fire Hazards in Nuclear Power Plants HAF J0071

(72) Format and Content of Safety Analysis Report on Decommissioning of Research Reactors HAF J0072

(73) Standard Review Program for Research Reactor Emergency Plan HFB J0073

(74) Accident Management Programs for Nuclear Power Plants - Prevention and Mitigation of Severe Accidents HFB J0074

(75) Quality Assurance for Safe Transportation of Radioactive Materials HFB J0075

(76) Requirements and Methods for Accepting Low- and Medium-level Radioactive Waste Packages HFB J0076

(77) Management of Decommissioning of Nuclear Facilities HFB J0077

(78) Quality Assurance of Waste Package HFB J0078

(79) Acceptance, Inspection and Trial Operation Test of Nuclear Fuel Reprocessing Facilities HFB J0079

(80) Guideline for In-service Inspection of Nuclear Power Plants HFB J0080

(82) Research Reactor Aging Management HFB J0082

(83) Nuclear Safety Classification of Research Reactor HFB J0083

(84) Criteria for Fire Prevention of Research Reactors HFB J0084

(85) Format and Content of Progress Report on Nuclear Power Plant Construction HFBJ0085

(86) Design Criteria of Atmospheric Pressure Reactors for Seawater Desalination Plant HFB J0086

(87) Standard Review Program for Research Reactor Safety Analysis Report HAB J0087

(88) Standard Format and Content of Probabilistic Safety Assessment Report for Nuclear Power Plants HAF J0088

(90) Safe Shutdown of Research Reactors HAF J0090

3.8 International Conventions

(1) Convention on Nuclear Safety

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

(3) Convention on the Physical Protection of Nuclear Material

(4) Convention on Early Notification of a Nuclear Accident

(5) Convention on Assistance in Case of a Nuclear Accident or Radiological Emergency

Annex 4

IAEA Safety Standards

S/N	Number	Title
1	SF-1	Fundamental Safety Principles
2	GS-R-2	Preparedness and Response for Nuclear or Radiological Emergency
3	GSR Part1	Governmental, Legal and Regulatory Framework for Safety
4	GSR Part2	Leadership and Management for Safety
5	GSR Part3	Radiation Protection and Safety of Radiation Sources:International Basic Safety Standards
6	GSR Part4	Safety Assessment for Facilities and Activities
7	GSR Part5	Predisposal Management of Radioactive Waste
8	GSR Part6	Decommissioning of Facilities
9	GSG-1	Classification of Radioactive Wastes
10	GSG-2	Criteria for Use in Preparedness and Response for Nuclear or Radiological Emergency
11	GSG-3	The Safety Case and Safety Assessment for the Predisposal Management of Radioactive Waste
12	GSG-4	Use of External Experts by the Regulatory Body
13	GSG-5	Justification of Practices, including Non-Medical Human Imaging
14	GS-G-1.1	Organization and Staffing of the Regulatory Body for Nuclear Facilities
15	GS-G-1.2	Review and Assessment of Nuclear Facilities by the Regulatory Body
16	GS-G-1.3	Regulatory Inspection of Nuclear Facilities and Enforcement by the Regulatory Body
17	GS-G-1.4	Documentation for Use in Regulating Nuclear Facilities
18	GS-G-1.5	Regulatory Control of Radiation Sources
19	GS-G-2.1	Arrangements for Preparedness for Nuclear or Radiological Emergency
20	GS-G-3.1	Application of the Management System for Facilities and Activities

S/N	Number	Title
21	GS-G-3.2	The Management System for Technical Services in Radiation Safety
22	GS-G-3.3	The Management System for Processing, Handling and Storage of Radioactive Waste
23	GS-G-3.4	The Management System for Disposal of Radioactive Waste
24	GS-G-3.5	The Management System for Nuclear Installations
25	GS-G-4.1	Format and Content of the Safety Analysis Report for Nuclear Power Plants
26	RS-G-1.1	Occupation Radiation Protection
27	RS-G-1.2	Assessment of Occupational Exposure Due to Intakes of Radionuclides
28	RS-G-1.3	Assessment of Occupational Exposure Due to External Sources of Radiation
29	RS-G-1.4	Competence Construction in Radiation Protection and the Safe Use of Radiation Sources
30	RS-G-1.5	Radiological Protection of Medical Exposure to Ionizing Radiation
31	RS-G-1.6	Occupational Radiation Protection in the Mining and Processing of Raw Materials
32	RS-G-1.7	Application of the Concepts of Exclusion, Exemption and Clearance
33	RS-G-1.8	Environmental and Radioactive Source Monitoring for Purposes of Radiation Protection
34	RS-G-1.9	Categorization of Radioactive Sources
35	RS-G-1.10	Safety of Radiation Generators and Sealed Radioactive Sources
36	WS-G-1.2	Management of Radioactive Waste from the Mining and Milling Ores
37	WS-G-2.2	Decommissioning Management of Medical, Industrial and Research Facilities
38	WS-G-2.3	Regulatory Control of Radioactive Discharge to the Environment
39	WS-G-2.5	Predisposal Management of Low and Intermediate Level Radioactive Wastes
40	WS-G-2.6	Predisposal Management of High Level Radioactive Wastes
41	WS-G-2.7	Management of Waste from the Use of Radioactive Material in Medicine, Industry, Agriculture, Research and Education
42	WS-G-3.1	Remediation Process for Areas Affected by Past Activities and Accidents
43	WS-G-5.1	Releases of Sites from Regulatory Control on Termination of Practices

S/N	Number	Title
44	WS-G-5.2	Safety Assessment for the Decommissioning of Facilities Using Radioactive Material
45	WS-G-6.1	Storage of Radioactive Waste
46	NS-R-3	Site Evaluation for Nuclear Installation
47	NS-R-4	Safety of Research Reactors
48	SSR-4	Safety of Nuclear Fuel Cycle Facilities
49	NS-G-1.1	Software for Computer Based Systems Important to Safety in Nuclear Power Plants
50	NS-G-1.3	Instrumentation and Control Systems Important to Safety in Nuclear Power Plants
51	NS-G-1.4	Design of Fuel Handling and Storage Systems in Nuclear Power Plants
52	NS-G-1.5	External Events Excluding Earthquakes in the Design of Nuclear Power Plants
53	NS-G-1.6	Design and Qualification for Nuclear Power Plants
54	NG-G-1.7	Protection Against Internal Fires and Explosions in the Design of Nuclear Power Plants
55	NS-G-1.8	Design of Emergency Power Systems for Nuclear Power Plants
56	NS-G-1.9	Design of Reactor Coolant System and Associated Systems in Nuclear Power Plants
57	NS-G-1.10	Design of Reactor Containment System for Nuclear Power Plants
58	NS-G-1.11	Protection against Internal Hazards other than Fires and Explosions in the Design of Nuclear Power Plants
59	NS-G-1.12	Design of the Reactor Core for Nuclear Power Plants
60	NS-G-1.13	Radiation Protection Aspects of Design for Nuclear Power Plants
61	NS-G-2.1	Fire Safety in the Operation of Nuclear Power Plants
62	NS-G-2.2	Operational Limits and Conditions and Operating Procedures for Nuclear Power Plants
63	NS-G-2.3	Modifications to Nuclear Power Plants
64	NS-G-2.4	The Operating Organization for Nuclear Power Plants
65	NS-G-2.5	Core Management and Fuel Handling for Nuclear Power Plants
66	NS-G-2.6	Maintenance, Surveillance and In-Service Inspection in Nuclear Power Plants

S/N	Number	Title
67	NS-G-2.7	Radiation Protection and Radioactive Waste Management in the Operation of Nuclear Power Plants
68	NS-G-2.8	Recruitment, Qualification and Training of Personnel for Nuclear Power Plants
69	NS-G-2.9	Commissioning for Nuclear Power Plants
70	NS-G-2.11	A System for the Feedback of Experience from Events in Nuclear Installations
71	NS-G-2.12	Aging Management for Nuclear Power Plants
72	NS-G-2.13	Evaluation of Seismic Safety for Existing Nuclear Installations
73	NS-G-2.14	Conduct of Operations at Nuclear Power Plants
74	NS-G-2.15	Severe Accident Management Programs for Nuclear Power Plants
75	NS-G-3.1	External Human Induced Events in Site Evaluation for Nuclear Power Plants
76	NS-G-3.2	Dispersion of Radioactive Material in Air and Water and Consideration of Population Distribution in Site Evaluation of Nuclear Power Plants
77	NS-G-3.6	Geotechnical Aspects of Site Evaluation and Foundations for Nuclear Power Plants
78	NS-G-4.1	Commissioning of Research Reactors
79	NS-G-4.2	Maintenance, Periodic Testing and Inspection of Research Reactors
80	NS-G-4.3	Core Management and Fuel Handling for Research Reactors
81	NS-G-4.4	Operational Limits , Conditions and Operating Procedures for Research Reactors
85	NS-G-4.5	The Operating Organization and the Recruitment, Training and Qualification of Personnel for Research Reactors
86	NS-G-4.6	Radiation Protection and Radioactive Waste Management in the Design and Operation of Research Reactors
87	WS-G-2.1	Decommissioning of Nuclear Power Plants and Research Reactors
88	WS-G-2.3	Regulatory Control of Radioactive Discharge to the Environment
89	WS-G-2.4	Decommissioning of Nuclear Fuel Cycle Facilities
90	WS-G-2.5	Predisposal Management of Low and Intermediate Level Radioactive Wastes
91	WS-G-2.6	Predisposal Management of High Level Radioactive Wastes
92	WS-G-3.1	Remediation Process for Areas Affected by Past Activities and Accidents

S/N	Number	Title
93	WS-G-5.1	Releases of Sites from Regulatory Control on Termination of Practices
94	WS-G-5.2	Safety Assessment for the Decommissioning of Facilities Using Radioactive Material
95	WS-G-6.1	Storage of Radioactive Waste
96	WS-R-5	Decommissioning of Facilities Using Radioactive Material
97	TS-G-1.2ST-3	Planning and Preparing for Emergency Response to Transport Accidents Involving Radioactive Material
98	TS-G-1.3	Radiation Protection Programs for the Transport of Radioactive Material
99	TS-G-1.4	The Management System for the Safe Transport of Radioactive Material
100	TS-G-1.5	Compliance Assurance for the Safe Transport of Radioactive Material
102	TS-G-1.6	IAEASchedules of Provisions of the IAEA Regulations for the Safe Transport of Radioactive Material (2009 Edition)
103	SSG-1	Borehole Disposal Facilities for Radioactive Waste
104	SSG-2	Deterministic Safety Analysis for Nuclear Power Plants
105	SSG-3	Development and Application of Level 1 Probabilistic Safety Assessment for Nuclear Power Plants
106	SSG-4	Development and Application of Level 2 Probabilistic Safety Assessment for Nuclear Power Plants
107	SSG-5	Safety of Conversion Facilities and Uranium Enrichment Facilities
108	SSG-6	Safety of Uranium Fuel Fabrication Facilities
109	SSG-7	Safety of Uranium and Plutonium Mixed Oxide Fuel Fabrication Facilities
110	SSG-8	XRadiation Safety of Gamma, Electron and X Ray Irradiation Facilities
111	SSG-9	Seismic Hazards in Site Evaluation for Nuclear Installations
112	SSG-10	Aging Management for Research Reactors
113	SSG-11	Radiation Safety in Industrial Radiography
114	SSG-12	Licensing Process for Nuclear Installations
115	SSG-13	Chemistry Program for water cooled Probabilistic Safety Assessment for Nuclear Power Plants
116	SSG-14	Geological Disposal Facilities for Radioactive Waste

S/N	Number	Title
117	SSG-15	Storage of Spent Nuclear Fuel
118	SSG-16	Establishing the Safety Infrastructure for a Nuclear Power Project
119	SSG-17	Control of Orphan Sources and Other Radioactive Material in the Metal Recycling and Production Industries
120	SSG-18	Meteorological and Hydrological Hazards in Site Evaluation for Nuclear Installations
121	SSG-19	National Strategy for Regaining Control over Orphan Sources and Improving Control over Vulnerable Sources
122	SSG-20	Safety Assessment for Research Reactors and Preparation of the Safety Analysis Report
123	SSG-21	Volcanic Hazards in Site Evaluation for Nuclear Installations
124	SSG-22	The Use of Graded Approach in the Application of the Safety Requirements for Research Reactors
125	SSG-23	The Safety Case and Safety Assessment for the Disposal of Radioactive Waste
126	SSG-24	Safety in the Utilization and Modification of Research Reactors
127	SSG-25	Periodic Safety Review for Nuclear Power Plants
128	SSG-26	IAEAAdvisory Material for the IAEA Regulations for the Safe Transport of Radioactive Material (2012 Edition)
129	SSG-27	Criticality Safety in the Handling of Fissile Material
130	SSG-28	Commissioning for Nuclear Power Plants
131	SSG-29	Near Surface Disposal Facilities for Radioactive Waste
132	SSG-30	Safety Classification of Structures, Systems and Components in Probabilistic Safety Assessment for Nuclear Power Plants
133	SSG-31	Monitoring and Surveillance of Radioactive Waste Disposal Facilities
134	SSG-32	Protection of the Public Against Exposure Indoors due to Radon and Other Natural Sources of Radiation
135	SSG-35	Site Survey and Siting for Nuclear Installations
136	SSG-38	Construction for Nuclear Installations
137	SSG-41	Predisposal Management of Radioactive Waste from Nuclear Fuel Cycle Facilities
138	SSG-42	Safety of Nuclear Fuel Reprocessing Facilities
139	SSG-43	Safety of Nuclear Fuel Cycle Research and Development Facilities

S/N	Number	Title
140	SSR-2/1	Safety of Nuclear Power Plants: Design
141	SSR-2/2	Safety of Nuclear Power Plants: Commissioning and Operation
142	SSR-5	Disposal of Radioactive Waste
143	SSR-6	Regulations for the Safe Transport of Radioactive Material, 2012 Edition