NUCLEAR SAFETY AND SECURITY, OUR TOP PRIORITY

Nuclear Safety & Security Commission

Nuclear Safety and
Security Commission
Republic of Korea

Message from the Chairperson

The Nuclear Safety and Security Commission ensures public safety and protects the public against any radioactive hazards resulting from the use of nuclear power.

All of the NSSC staff, including myself, are making our utmost effort to keep the public safe and relieved.

I promise you that the NSSC will continue to do our best to become a reliable nuclear regulator based on scientific objectivity and with open-to-public safety regulations.

We will listen to the public with an open mind, whether it is a policy proposal or a harsh comment to reprimand us. We will always stand with the public.

Thank you

Chairperson
Guk-hee YOO

The Nuclear Safety and Security Commission is responsible for regulation of nuclear safety and security, and nuclear nonproliferation in Korea.

The Commission was established in 2011 to protect people and the environment from the hazards that might result from the utilization of nuclear energy.

With enhanced independence, technical expertise, and transparency, the NSSC brings better nuclear safety to Korea and beyond.

Vision

Building a Nuclear Safety System that People and the World Trust

Mission

To protect people and the environment and to contribute to the peace of mankinds,
- We ensure the highest level of nuclear safety.
- We protect nuclear facilities from both internal and external threats, such as terrorism.
- We strengthen emergency system for any nuclear emergency or accidents.
- We comply with international standards for the peaceful use of nuclear energy.

History

The promotion and regulation of nuclear energy in Korea was originally managed by a single government agency (the former Ministry of Education, Science and Technology). However, in an effort to enhance regulatory independence and fairness, the Korean government decided to separate the regulatory responsibilities from the previous nuclear energy administrative system. As a result, the NSSC was established as an independent administrative agency in 2011 in order to take a holistic approach to nuclear safety to protect people and the environment from nuclear and radioactive threats.

1958 Enactment of the Atomic Energy Act

1959 Establishment of the First Government Agency in Charge of Nuclear Energy, Atomic Energy Administration

1962 Operation of the First Research Reactor [TRIGA MARK II]

1978 Commercial Operation of the First Nuclear Power Plant, Kori Unit 1

1990 Establishment of the Korea Institute of Nuclear Safety (KINS)

1995 Operation of Research Reactor, Hanaro

1998 Commercial Operation of the First Korean Standard Nuclear Power Plant, Hanul Unit 3

2003 Enactment of the Act on Physical Protection and Radiological Emergency

2006 Establishment of the Korea Institute of Nuclear Non-proliferation and Control (KINAC)

2009 Export of APR-1400 (Reactor developed by Korea) to UAE

2011 Establishment of the Nuclear Safety and Security Commission (NSSC)

Enactment of the Act on Protective Action Guidelines against Radiation in the Natural Environment

2012 Seoul Nuclear Security Summit

2013 Opening of Kori Site Office Launch of the Nuclear Safety Council at NPP Sites

2014 Opening of International Nuclear Non-proliferation and Security Academy (INSA)

Opening of Wolsong, Hanul and Hanbit Site Offices

2017 Permanent shutdown of Kori Unit 1

2018 Opening of the NORM Safety Center

2020 Opening of Deajeon Site Office

2021 Enactment of the Act on Nuclear Safety Information Disclosure and Communication

Statute

Legislations including the Nuclear Safety Act, the Act on Physical Protection and Radiological Emergency, the Nuclear Liability Act and the Act on Protective Action Guidelines against Radiation in the Natural Environment underlie the NSSC regulatory principles and safety management system.

Acts	• Act on the Establishment and Operation of the NSSC • Nuclear Safety Act • Act on Physical Protection and Radiological Emergency • Nuclear Liability Act • Act on Governmental Contracts for Nuclear Damage Compensation • Act on Protective Action Guidelines Against Radiation in the Natural Environment • Act on Nuclear Safety Information Disclosure and Communication
Enforcement Decrees (Presidential Decrees)	• Particulars entrusted by the Act - Enforcement Decree of the Nuclear Safety Act and Enforcement Decrees of other related Acts
Enforcement Regulations (Ordinance of the Prime Minister)	• Specifics delegated by the Act and/or Decree and necessary for their enforcement (including detailed procedures and format of documents) - Enforcement Regulations of the Nuclear Safety Act and Enforcement Regulations of other related Acts
Technical Standards (Administrative Regulation)	• Brief technical standards as delegated by the Acts and/or Decrees - Regulations on Technical Standards for Nuclear Reactor Facilities, etc., Regulations on Technical Standards for Radiological Safety Management, etc.
NSSC Notices (Administrative Regulation)	• Details on technical standards, procedures or formats as delegated by the Acts, Decrees, Regulations - Notice on technical standards for the location of nuclear installations,etc.

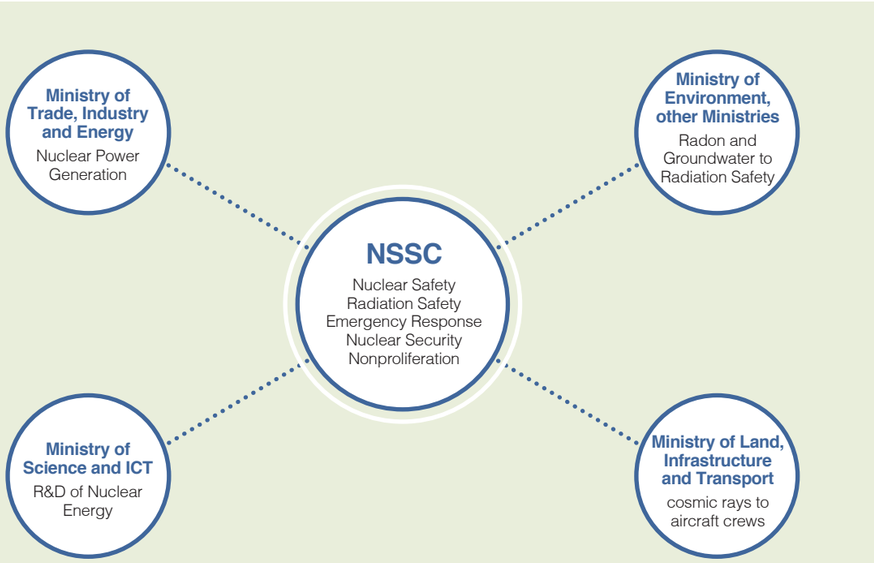
Regulatory Standards	• Further particulars or interpretation of technical standards
Regulatory Guidelines	• Acceptable methods, conditions, specifications, etc.
Guidelines for Safety Review and Inspection	• Standards Review Plan, Inspection Manuals, etc.

Industrial Code and Standards	• KEPIC, ASME, IEEE, ASTM, etc.

Administrative System

The NSSC is one of the central government agencies that is independent and responsible for nuclear safety, security and non-proliferation. It was established to protect people and the environment from the risks of radiation and supervise radiation-users' implementation of safety management responsibilities.

After being established under the President of the Republic of Korea pursuant to the Act on Establishment and Operation of the NSSC in 2011, the NSSC was relocated under the Prime Minister's Office following a cabinet reshuffle in 2013. The NSSC independently regulates overall nuclear safety and cooperates with ministries such as the Ministry of Science and ICT (MSIT), the Ministry of Trade, Industry and Energy (MOTIE), the Ministry of Environment (ME), and the Ministry of Land, Infrastructure and Transport (MOLIT).



Staff and Budget

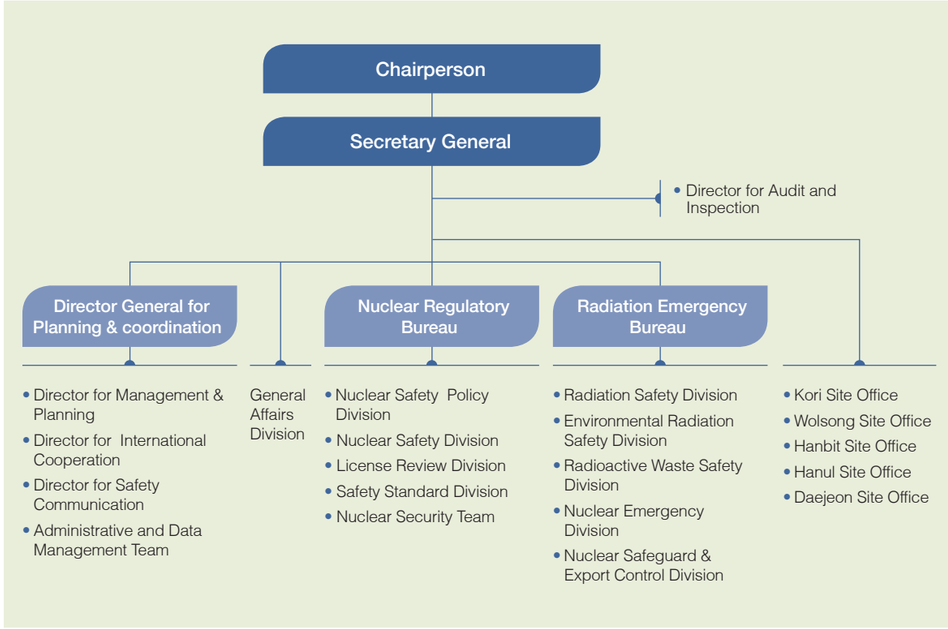
In an effort to ensure better regulatory approaches to nuclear safety, nuclear security and transparency, 285.4 billion KRW (USD 238 million) has been allocated to a nuclear safety regulation fund in 2022. As of the end of 2021, a total of 988 employees worked full-time (164 from the NSSC, 616 from the KINS, 127 from the KINAC and 81 from the KoFONS).

Organization

The Commission of the NSSC is headed by two standing commissioners (Chairperson and Secretary General), and seven non-standing commissioners (external professionals recommended by the Government and the National Assembly).

The NSSC has a head office, which consists of the Bureau for the Planning and Coordination, the Nuclear Regulatory Bureau and the Radiation Emergency Bureau, and five regional offices established nationwide.

The Korea Institute of Nuclear Safety (KINS), Korea Institute of Nuclear Non-proliferation and Control (KINAC) and Korea Foundation of Nuclear Safety (KoFONS) provide the NSSC with expertise and technical support for nuclear safety, security and nonproliferation.



Comprehensive Plans

The NSSC establishes the Comprehensive Plan on Nuclear Safety and Security, the Comprehensive Plan on Environmental Radiation Protection, and the National Plan on Radiological Emergency every five years. These plans are made in consultation with related agencies and help to set national guidelines for policies.

Enhanced Regulation on Nuclear Safety

To prepare against possible earthquakes and tsunamis, the NSSC improved the safety of nuclear power plants by requiring enhanced anti-seismic designs, installing automatic shutdown systems and flood gates, and extending flood barriers.

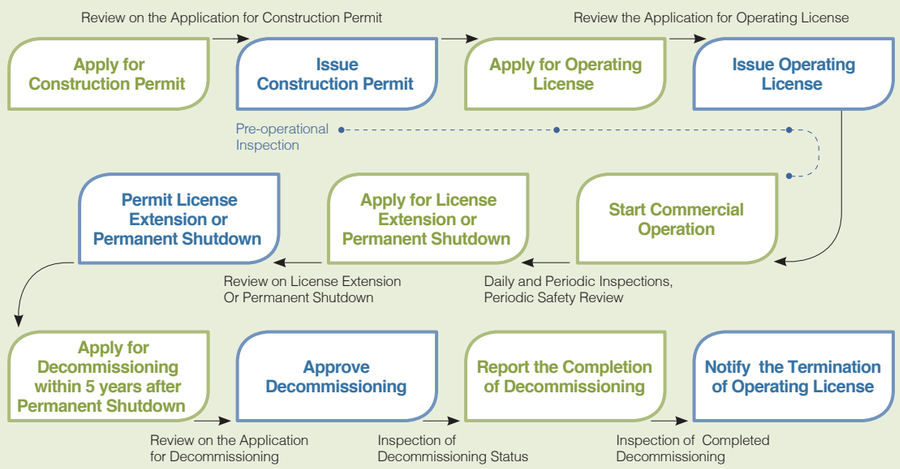
In case of loss of power or flooding in a nuclear power plant, the NSSC requires the licensee to have adequate prepared ness in place to prevent an initial event from advancing into a severe accident. The requirements include keeping mobile Emergency Diesel Generators and extra storage batteries at site, and installing outside injection channels for emergency cooling water. In preparation for damage to nuclear fuel, the NSSC requires every nuclear power plant to have measures in place to prevent massive release of radioactive materials such as installation of extra hydrogen elimination devices.

To establish a firm legal basis for regulatory control of severe accident, the NSSC revised the Nuclear Safety Act) in order to include all the matters necessary for the control of severe accident in the Act.

To improve emergency response capability and minimize damage to the sites and adjacent infrastructure in case of large release of radioactive materials, the NSSC conducts radiological emergency exercises and enhances response capability for simultaneous accidents at multiple reactors.

Safety Regulation Process for Nuclear Power Plants

The NSSC ensures strict safety regulation at all life stages of nuclear power plant starting from design through construction, operation, maintenance and decommissioning.

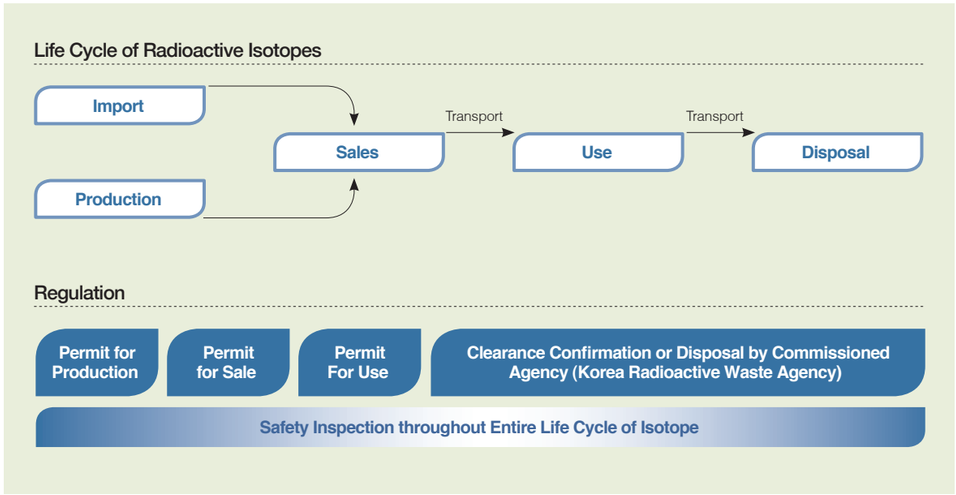


NSSC : Blue
Licensee : Green

Pre-operational Inspection: During all stages of construction process, a nuclear power plant is subject to inspections of the NSSC on its performance.

Regulation on Radiation

Multiple regulatory approaches have been taken for safe management of not only artificial radioactive materials but also Naturally-Occurring Radioactive Materials (NORM). The approaches include supervising radioactive isotope management in radiation-using facilities, regulating the designs and management of radiation-using facilities, and setting occupational dose limits, etc. The NSSC oversees safety management of more than 9,500 radiation-using facilities that use radiation for medical, industrial, radiographic, academic or research purposes.



The NSSC also strengthened both the facility control and monitoring of short and long-term impact from radiation on the health of radiation workers.

The NSSC has overall responsibility for safe management of radioactive wastes generated in nuclear power plants, nuclear fuel-cycle facilities and radiation-using facilities at all stages of production, storage, transport and disposal. We also conduct inspections to check the safety of radioactive waste disposal facilities from their construction through operation to closure.

The NSSC also protects people from environmental radiation sources to which people might be exposed in various ways, and provides safety guidelines to the associated industries. The NSSC requires radiation users to officially register source materials and by-products containing naturally occurring radioactive materials, provides relevant safety guidelines and operates radiation monitors at the airports and seaports nationwide.

Radiation Protection System

Korea established a national radiological emergency response system, led by the NSSC, with associated Ministries, in preparation against radioactive material leaks that might occur inside or outside the country. The NSSC enhances emergency response capabilities by holding drills assuming that challenging accidents such as complex disasters and simultaneous accidents at multiple reactors occur and evaluating the result.

When a radiological accident occurs at a nuclear facility, the NSSC organizes the National Emergency Management Committee, a radiological emergency control center, and directs all responses and recovery activities. To make timely and organized emergency responses, such as public evacuation, local emergency management centers are operated in the regions where nuclear facilities are located.

A nationwide real-time environmental radiation monitoring system is in operation for early detection of nuclear power plant accidents that might occur in Korea or neighboring countries. The NSSC regularly conducts radiation analysis and evaluation of airborne, inland and maritime radiation with the help of other associated agencies to protect people from radiological hazards such as imported radioactive materials contaminating domestic agricultural, livestock and fishery products.

Medical Service System for Radiological Emergency

The NSSC established a national radiological emergency medical management system, composed of the National Radiation Emergency Medical Center and 24 primary/secondary hospitals. The center can provide intensive treatment for patients exposed to radiation in case of a radiological accident. KI (potassium iodide) tablets in appropriate dosages are stockpiled with instructions on when to use, at all designated educational institutions, day-care centers, hospitals, police and fire stations, in quantities sufficient to protect the entire population from thyroid damage caused by major releases of radioactive iodide. The NSSC also disseminates public service messages through radio and TV stations to inform populations at risk where to get the KI tablets and when to take them. Military-Police-Fire joint emergency drills are regularly held to strengthen medical capabilities in case of radiological accident or terrorist attack.

National Regulatory Framework for Nuclear Security

The NSSC is in charge of national physical protection to prevent, detect, and respond to unauthorized removal, sabotage, and other malicious acts involving nuclear or radioactive materials or devices. Based on the information exchange and technology development with the IAEA, the NSSC has established world-class standards for physical protection. Every three years, we set Design Basis Threat (DBT), a basis for national nuclear security regulation, by assessing internal and external threats.

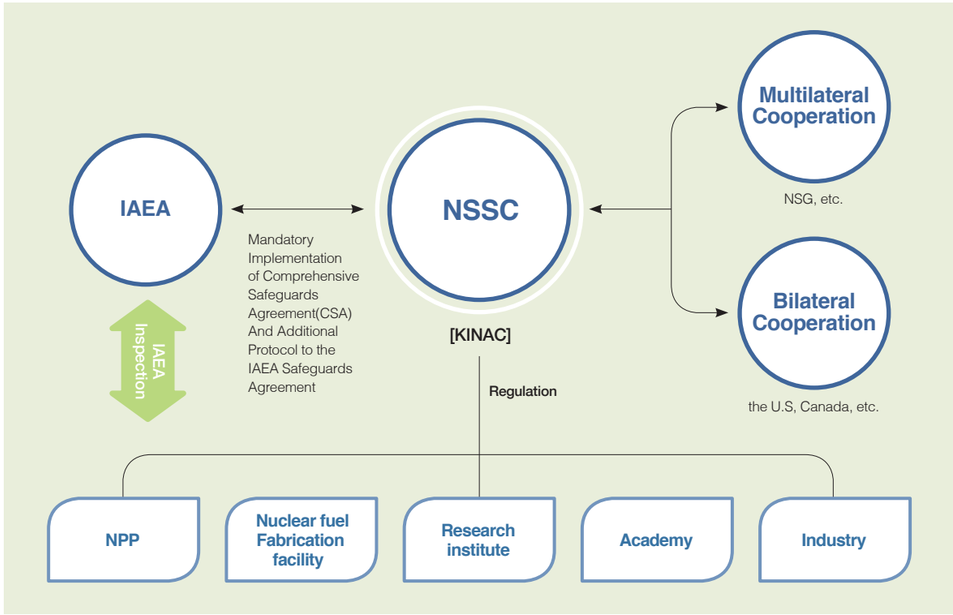
As a regulatory mission to ensure adequate physical protection, the NSSC reviews security plans, inspects implementation of physical protection in domestic nuclear facilities, and trains security staffs. To enhance preparedness against nuclear terrorism and establish effective systems to respond to such threats, the NSSC develops technologies and frameworks for detection and prevention of nuclear terrorism.

Nuclear Non-proliferation Activities and Implementation

The NSSC is an active supporter of the global nuclear non-proliferation regime. The NSSC has fully implemented its international obligations under the Comprehensive Safeguards Agreement (CSA) concluded in 1975, and the Additional Protocol (AP) that entered into force in 2004. We make our utmost efforts for ensuring the peaceful use of nuclear energy and enhancing nuclear transparency in the Korean peninsula.

The NSSC is responsible for licensing the export of nuclear materials, equipment, facilities, and related technologies. The NSSC follows the Nuclear Suppliers Group (NSG) guidelines and other international norms on export control including the United Nation Security Council Resolution (UNSCR) 1540. The NSSC issues an export license after examining whether the export items or technology are classified as a strategic item and the end-use/user. For efficient regulation, a one-stop e-licensing service is provided at the Nuclear Export and Import Control System (NEPS). The NSSC also runs outreach programs to inform exporters of national nuclear export control laws and their implementation process.

The International Nuclear Non-proliferation and Security Academy (INSA), which was founded in February 2014 in Daejeon, provides international training courses on safeguards, strategic trade controls and nuclear security (physical protection) to nuclear newcomer countries or countries planning to introduce nuclear power. Such transfer of know-hows and experience greatly contributes to strengthening global non-proliferation and nuclear security regime.



Communication and Information Disclosure

To establish reliable nuclear safety system for the public, the NSSC operates various channels that able us to communicate with local residents and makes a wide range of information on nuclear regulation publicly available.

Nuclear Safety Councils are set up for each region where a nuclear power plant site is located such as Kori, Hanbit, Hanul and Wolsong. With the participation of local residents and experts, the councils regularly meet and discuss regional concerns about nuclear safety and collect local residents' opinions and feedback.

Information on nuclear regulatory activities and nuclear safety is made available to the public in an prompt and transparent manner through various channels - the NSSC's official website (http://nssc.go.kr), blog (http://blog.naver.com/prnssc) and social media channels (https://www.youtube.com/nssckorea, https://www.facebook.com/prnssc, https://www.instagram.com/nssckorea, https://twitter.com/NSSCkorea).

The NSSC opened the Nuclear Safety Information Center (http://nsic.nssc.go.kr), an on-line portal that provides nuclear safety-related information, in June 2016. Any members of the public can visit the website and find information on nuclear safety, radiation safety, real-time environmental radiation, nuclear power plant accidents and failures, etc.

To root out corrupt actions in the nuclear industry and raise the awareness of nuclear safety through voluntary participation of workers in the industry and the public, the NSSC established the "Nuclear Safety Ombudsman" in June 2013. Reports can be submitted anonymously via website, e-mail, telephone, fax, or mail..

All nuclear safety information produced in the NSSC is required, in principle, to be disclosed to the public. Therefore, the NSSC ensures transparent decision-making process for nuclear safety policy, expands communication channels with local residents living near a nuclear power plant and makes a variety of nuclear regulatory information publicly available. All of the efforts are aimed at ensuring peoples' rights to know, enhancing transparency in nuclear safety regulations and creating a reliable nuclear safety system.

The NSSC increases transparency of decision-making process and gains public confidence by allowing the public to observe the meetings of the Commission, disclosing stenographic records of the meetings and preserving meeting recordings.

The Act on Nuclear Safety Information Disclosure and Communication was enacted in 2021 and took effect in June 2022 to expand the scope of information that should be made publicly available. The NSSC will keep the public aware of more information that corresponds to the public's

Nuclear Safety Policy Coordination Committee	• Coordinate nuclear safety-related policies and issues at the central government level, participated in by high ranking officials from the related ministries
Nuclear Safety Council	• Hold quarterly meetings with the Council members of each NPP site consisting of residents, local governments and the NSSC • Provide information to the local residents and discuss issues of mutual interest
Nuclear Safety Information Center	• Provide safety data such as review and inspection reports on NPPs in operation or under construction
Nuclear Safety Ombudsman	• Establish a prevention system against corruptive actions and irregularities in nuclear industry • Provide financial compensations to a whistleblower based on the investigation results of each case

Cooperation in General

The NSSC undertakes a broad range of overseas collaborative activities such as technical research, information sharing, and experts exchange, with the aim to improve nuclear safety, security and nonproliferation. If you need more information, please visit www.nssc.go.kr, calll +82 2 397 7271, or fax to +82 2 397 7393.

Cooperation with International Organizations

In an effort to strengthen cooperative partnership with international organizations such as the IAEA, the OECD/NEA, etc., the NSSC actively participate in a variety of international conferences, experts' meetings and working groups. By doing so, the NSSC significantly contribute to the advancing of nuclear safety standards and enhancing regulatory capabilities in the global community.

Regional Cooperation

Nuclear safety is of great significance to the Northeast Asia where nuclear power plants are densely located. Against this backdrop, the nuclear safety regulatory authorities from Korea, China and Japan established the Top Regulators' Meeting (TRM), a trilateral cooperative body, in 2008. The three countries hold annual meeting by rotation, exchange information on nuclear safety, and discuss issues of common interest.

For more practical and cooperative activities, the TRM currently operates two working groups - Human Resource Development (HRD) and Emergency Preparedness & Response (EPR) - and annually holds a joint emergency drill taking turns to improve emergency response capabilities in the region.

Bilateral Cooperation

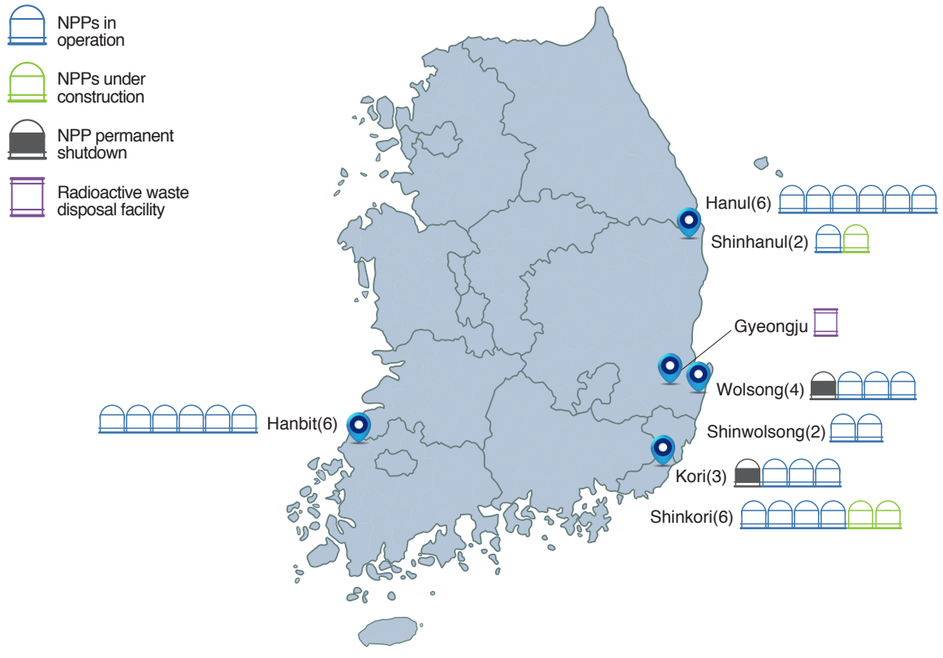
Bilateral cooperation for nuclear safety regulation, technology and policies has been strengthened especially in the fields of decommissioning and radioactive waste disposal with the American and European countries by holding more regular meetings and expanding exchange programs. In particular, the NSSC facilitates bilateral cooperation with the US and Canada on nuclear safety technology, regulatory standards and joint research by holding annual steering committee meetings.

Cooperation with Embarking Countries

The NSSC is actively helping the countries embarking on nuclear power development and potential nuclear energy users in regions such as Southeast Asia, the Middle East, and Africa, and is providing systematic support to aid the establishment of their national regulatory infrastructure through training, knowledge transfer and etc.

Facility Status

Type			No.	
Nuclear Reactor	Power Generating Reactor	In operation	25	Korea Hydro and Nuclear Power Co., Ltd[KHNP] [Kori (3), Shinkori (4), Wolsong (3), Shinwolsong (2), Hanul (6), Hanbit (6), Shinhanul (1))]
		Under Construction	3	Korea Hydro and Nuclear Power Co., Ltd[KHNP] [Shinkori (2), Shinhanul (1)]
		Permanent Shutdown	2	Korea Hydro and Nuclear Power Co., Ltd[KHNP] [Kori (1), Wolsong (1)]
	Research reactor		1	Korea Atomic Energy Research Institute[Hanaro]
	Education reactor		1	Kyunghee University[AGN-201]
Nuclear fuel Cycle facility	Nuclear fuel Fabrication facility	In operation	1	Korea Atomic Energy Research Institute[KAERI] [Research reactor nuclear fuel fabrication facility]
			2	Korea Electronic Power Corporation[KEPCO] [NPP nuclear fuel fabrication facility 1 st and 2 nd factory]
		Under construction	1	Korea Electronic Power Corporation[KEPCO] [NPP nuclear fuel fabrication facility 3 rd factory]
	Spent nuclear fuel Processing facility		1	Korea Atomic Energy Research Institute[KAERI] [Research on spent nuclear fuel]
Intermediate and low level radioactive waste disposal facility			1	Korea Radioactive Waste Agency[KORAD]
Radiation-using organizations			9,555	Organizations producing, selling and using radioactive isotopes and radiation generating devices



Nuclear Power Plants

Site	Kori	Shinkori	Wolsong	Shinwolsong	Hanul	Shinhanul	Hanbit	Total
Unit	3	4(2)	3	2	6	1(1)	6	25(3)
Capacity (MWe)	2,550	4,800 (2,800)	2,100	2,000	5,900	1,400 (1,400)	5,900	24,650 (4,200)

* Numbers in parenthesis indicate the number of reactors under construction.

Safety Management Facilities

- **Unmanned environmental radiation monitoring system**
  In total, 214 monitors are operating 24 hours nationwide.
- **Local radiation monitoring stations**
  The number of stations is 15.
- **The number of monitoring devices installed in domestic airports and seaports**
  10 (2012) → 32 (2013) → 53 (2014) → 73 (2015) → 96 (2016) → 116 (2017) → 122(2018) → 128(2019) → 134(2020) → 137(2021)

Radiation-using Organizations

Type	Industrial Organization, etc.	Medical Organization	Education and Research Organization	Total
Unit	8,702	184	669	9,555

* Increase in number of organizations : 1,692 (2000) → 2,723 (2005) → 5,155 (2011) → 5,606 (2012) → 6,085 (2013) → 7,474 (2016) → 7,938(2017) → 8,314(2018) → 8,719(2019) → 9,142(2020) → 9,555(2021)

MOU

Country	Date	Country	Date
UAE(FANR)	Dec. 20, 2011	CANADA(CNSC)	Apr. 16, 2012
FINLAND(STUK)	May 4, 2012	USA(NRC)	Sept. 18, 2012
FRANCE(ASN)	Oct. 19, 2012	SWEDEN(SSM)	Sept. 23, 2014
GERMANY(BMUB)	Sept. 24, 2014	JORDAN(EMRC)	Dec. 22, 2014
VETNAM(VARANS)	Sept. 15, 2015	CHINA(NNSA)	Nov. 26, 2015
K.S.A(K.A.CARE)	Nov. 22, 2016	RUSIA(RTN)	Sept. 19, 2018
THAILAND(O.A.P)	Sept. 19, 2018		

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