

NUCLEAR SAFETY AND SECURITY, OUR TOP PRIORITY

# Nuclear Safety & Security Commission



Nuclear Safety and  
Security Commission

13F KT Bldg., 178 Sejong-daero, Jongno-gu, Seoul,  
03154, Republic of Korea [www.nssc.go.kr](http://www.nssc.go.kr)



Nuclear Safety and  
Security Commission  
Republic of Korea

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**Message from  
the Chairperson**



The Nuclear Safety and Security Commission was launched after the accident at Fukushima Daiichi nuclear power station as people longed for a safer community.

To keep up with the people's hope, I pledge that I will always do my best to bring the level of nuclear safety to a higher level so that people can have trust and relief.

The NSSC will reach out and communicate with people thinking in their shoes and try hard for the boot-on-the-ground oversight.

Thank you.

Chairperson  
**Jaesik UHM**

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*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 Commission brings better nuclear safety to Korea and beyond.*

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**Vision**

# Nuclear Safety and Security, Our Top Priority

Nuclear Safety, Security and Nonproliferation  
Trusted by People and the World

**Mission**

The Nuclear Safety and Security Commission (NSSC) is committed to protecting people and the environment and contributing to global peace and prosperity. To fulfill the mission, the NSSC pursues the highest level of nuclear safety and security, protects nuclear facilities from internal and external threats such as terrorist attacks, strengthens emergency response against radiological disasters, and complies with the international regulations for peaceful use of nuclear energy.

**History**

The promotion and regulation of nuclear energy in Korea were 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 organization in 2011 in order to take the responsibility of the comprehensive nuclear safety to protect people and the environment from nuclear and radioactive threats.

<p>1958 Enactment of the Atomic Energy Act</p> <p>1959 Establishment of the First Government Agency in Charge of Nuclear Energy, Atomic Energy Administration</p> <p>1962 Operation of the First Research Reactor [TRIGA MARK II]</p> <p>1978 Commercial Operation of the First Nuclear Power Plant, Kori Unit 1</p>	<p>1990 Establishment of the Korea Institute of Nuclear Safety (KINS)</p> <p>1995 Operation of Research Reactor, Hanaro</p> <p>1998 Commercial Operation of the First Korean Standard Nuclear Power Plant, Hanul Unit 3</p>	<p>2003 Enactment of the Act on Physical Protection and Radiological Emergency</p> <p>2006 Establishment of the Korea Institute of Nuclear Non-proliferation and Control (KINAC)</p> <p>2009 Export of APR-1400 (Reactor developed by Korea) to UAE</p>	<p>2011 Establishment of the Nuclear Safety and Security Commission (NSSC)</p> <p>2012 Seoul Nuclear Security Summit</p> <p>2013 Opening of Kori Site Office Launch of the Nuclear Safety Council at NPP Sites</p> <p>2014 Opening of International Nuclear Non-proliferation and Security Academy (INSA) Opening of Wolsong, Hanul and Hanbit Site Offices</p> <p>2017 Permanent shutdown of Kori Unit 1</p> <p>2018 Opening of the NORM Safety Center</p>
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**Statute**

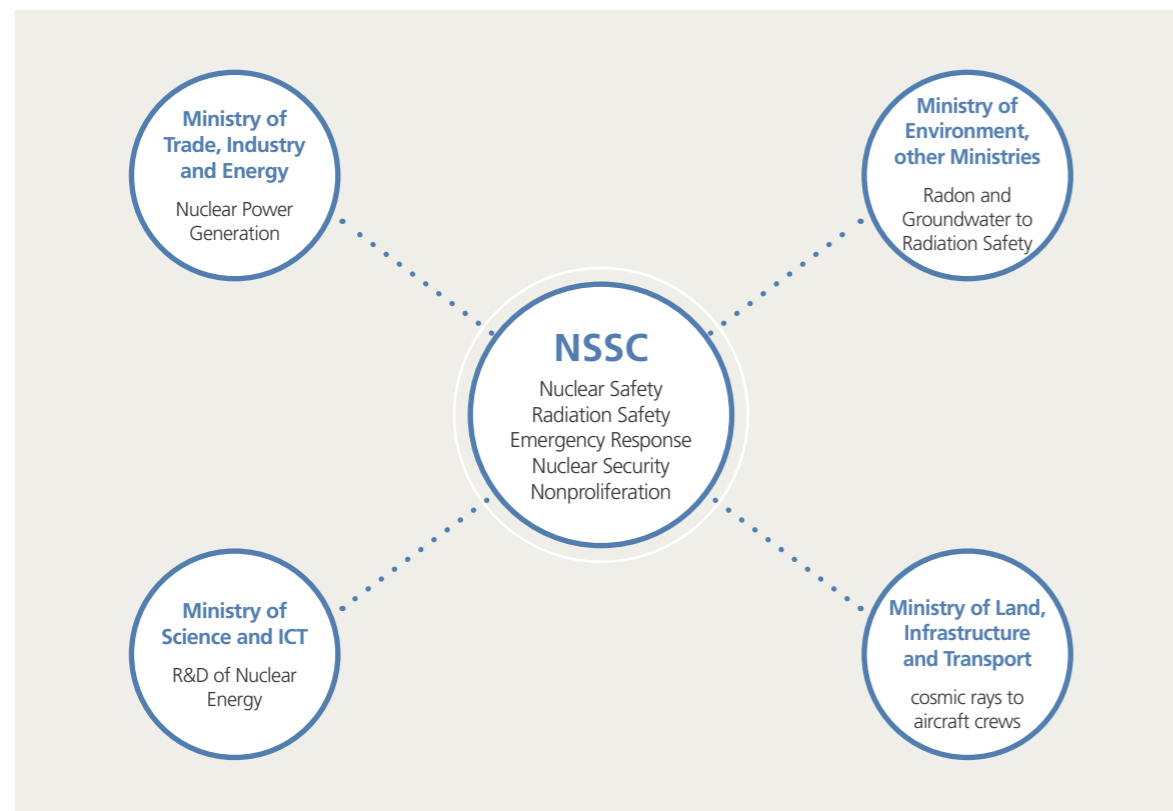
Legislations including the Nuclear Safety Act, the Act on Physical Protection and Radiological Emergency, the Nuclear Liability Act and the Act on Protective Action Guidelines against radiation in the natural environment underlie the NSSC regulatory principles and safety management system.

<b>Acts</b>	<ul style="list-style-type: none"> <li>Act on the Establishment and Operation of the NSSC</li> <li>Nuclear Safety Act, Act on Physical Protection and Radiological Emergency, Nuclear Liability Act, Act on Protective Action Guidelines Against Radiation in the Natural Environment etc.</li> </ul>
<b>Enforcement Decrees</b> (Presidential Decrees)	<ul style="list-style-type: none"> <li>Particulars entrusted by the Act</li> <li>- Enforcement Decree of the Nuclear Safety Act and Enforcement Decrees of other related Acts</li> </ul>
<b>Enforcement Regulations</b> (Ordinance of the Prime Minister)	<ul style="list-style-type: none"> <li>Specifics delegated by the Act and/or Decree and necessary for their enforcement (including detailed procedures and format of documents)</li> <li>- Enforcement Regulations of the Nuclear Safety Act and Enforcement Regulations of other related Acts</li> </ul>
<b>Technical Standards</b> (Administrative Regulation)	<ul style="list-style-type: none"> <li>Brief technical standards as delegated by the Acts and/or Decrees</li> <li>- Regulations on Technical Standards for Nuclear Reactor Facilities, etc., Regulations on Technical Standards for Radiological Safety Management, etc.</li> </ul>
<b>NSSC Notices</b> (Administrative Regulation)	<ul style="list-style-type: none"> <li>Details on technical standards, procedures or formats as delegated by the Acts, Decrees, Regulations</li> <li>- Notice on technical standards for the location of nuclear installations, etc.</li> </ul>
<b>Regulatory Standards</b>	<ul style="list-style-type: none"> <li>Further particulars or interpretation of technical standards</li> </ul>
<b>Regulatory Guidelines</b>	<ul style="list-style-type: none"> <li>Acceptable methods, conditions, specifications, etc.</li> </ul>
<b>Guidelines for Safety Review and Inspection</b>	<ul style="list-style-type: none"> <li>Standards Review Plan, Inspection Manuals, etc.</li> </ul>
<b>Industrial Code and Standards</b>	<ul style="list-style-type: none"> <li>KEPIC, ASME, IEEE, ASTM, etc.</li> </ul>

## Administrative System

The NSSC is an independent agency of the central government responsible for nuclear safety, security and nonproliferation. It was established to protect people and the environment from the risk 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 moved to the Prime Minister's Office following a cabinet reshuffle in 2013. The NSSC independently regulates overall nuclear safety as a government body 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)

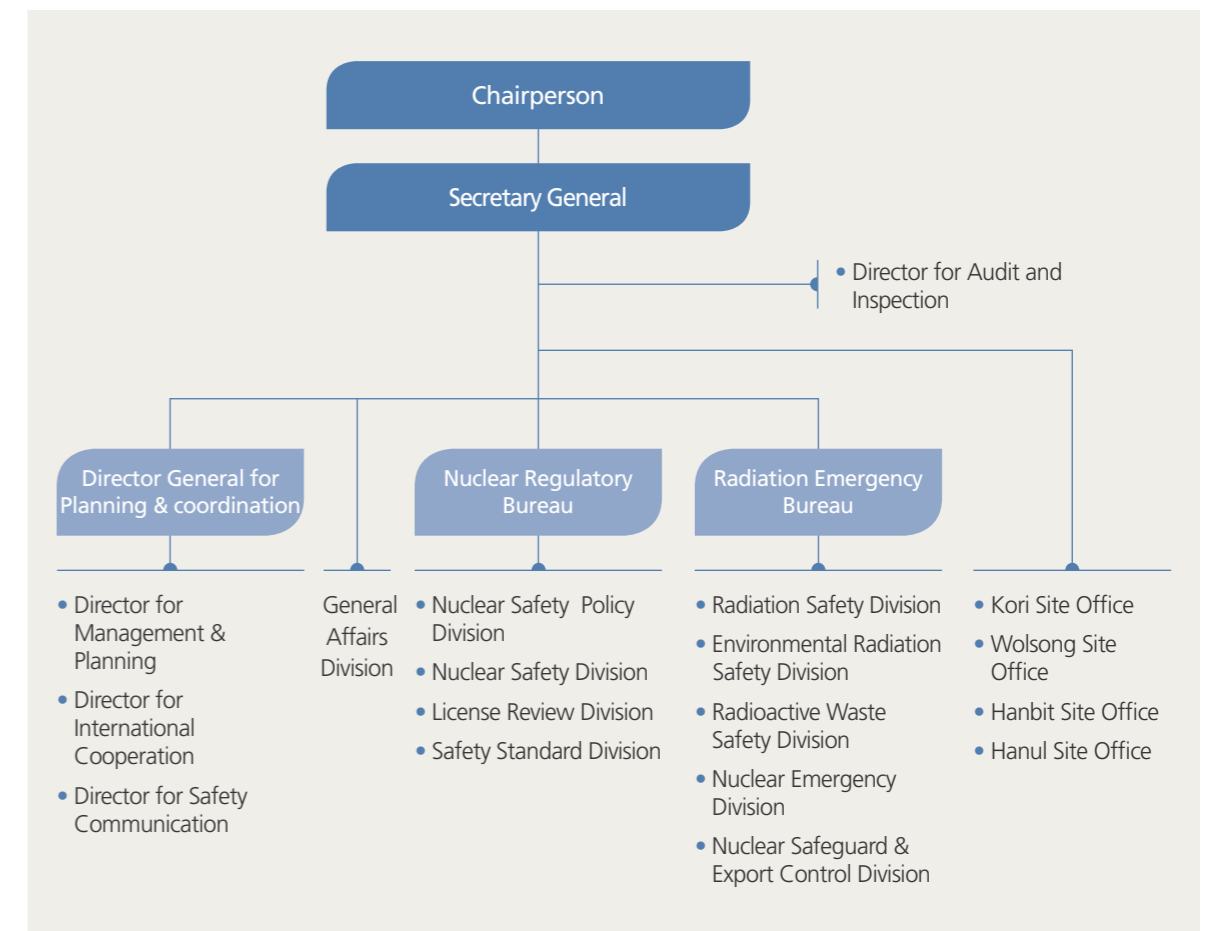


## Organization

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 four regional offices 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.



## Staff and Budget

In an effort to strengthen regulations on nuclear safety and security, and ensure regulatory transparency, 203.6 billion KRW (USD 182 million) has been allocated to a nuclear safety regulation fund in 2019. As of the end of 2018, a total of 861 employees worked full-time to enhance nuclear safety regulation (155 from the NSSC, 553 from the KINS, 106 from the KINAC and 47 from the KoFONS).

### Regulation on Nuclear Safety

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

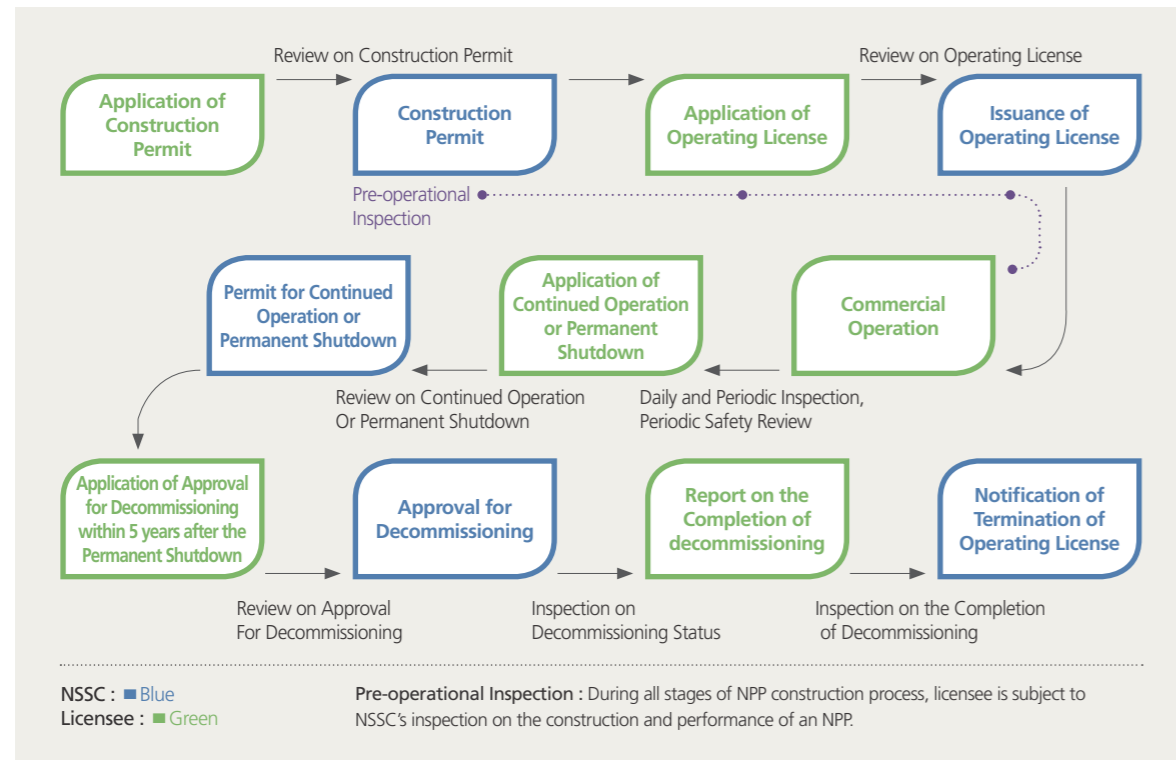
In case of loss of power or flooding of nuclear power plants, the NSSC requires preparations to prevent the situation from advancing into a severe accident by providing mobile EDGs (Emergency Diesel Generators) and extra storage batteries, and installing outside injection channels for emergency cooling water. In case of a damage to nuclear fuel, the NSSC requires measures to prevent massive release of radioactive materials including the installation of extra hydrogen elimination devices and CFVS (Containment Filtered Venting System).

To establish a firm legal basis for regulatory control of severe accident, the NSSC revised the NSA (the Nuclear Safety Act) and carried out subsequent rule-making process to stipulate all the necessary matters on regulatory control of severe accident.

To improve emergency response capability and minimize damage to the nuclear site and adjacent infrastructure in case of large release of radioactive materials, the NSSC carries out radiological emergency response exercise and enhances response capability for simultaneous accidents at multiple reactors.

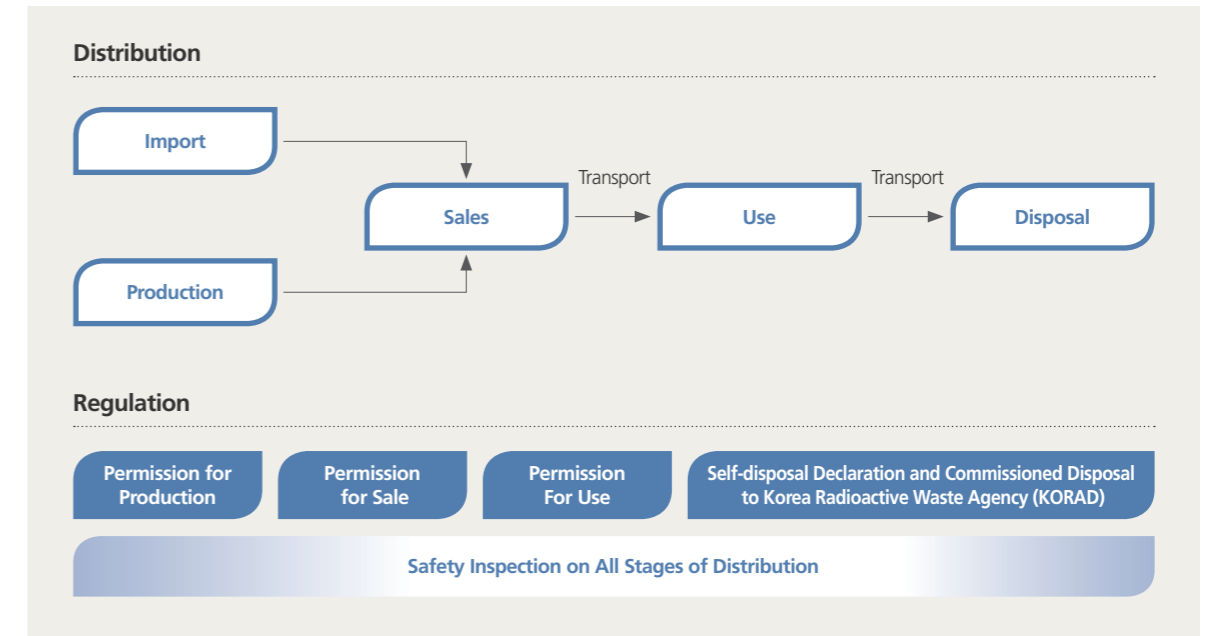
### Safety Regulation Process for Nuclear Power Plants

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



### Safety 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 supervision of safe handling of radioactive isotopes in radiation-using facilities, determinations on the design and managements of radiation-using facilities, limitation of radiation workers' exposure to radiation, etc. The NSSC oversees safety management of more than 8,300 radiation-using facilities including hospitals, industrial organizations, radiography institutes, schools, research centers, etc.



It also strengthens both the facility controls and monitoring of both short and long-term radiological impacts on the health of radiation-using 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. Inspection on the safety of radioactive waste disposal facilities is also carried out from construction through operation to closure.

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

### Radiation Protection System

Korea has established 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 and evaluating drills assuming challenging accidents such as complex disasters and simultaneous accidents at multiple reactors.

When a radiological accident occurs at a nuclear facility, the NSSC organizes a national emergency management committee, Off-site Emergency Management Center (OEMC), 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 formulated 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 radiological accident. KI (potassium iodide) tablets in appropriate dosages are stockpiled, available with instructions on when to use, at all designated educational institutions, day-care centers, hospitals, police and fire stations, in quantities sufficient to provide protection for the entire population from thyroid damage caused by major releases of radioactive iodide. It also disseminates public service messages ready for radio and TV stations to inform at-risk populations 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 regulatory framework for nuclear security to prevent, detect, and respond to unauthorized removal and sabotage involving nuclear materials, other radioactive materials and associated facilities. To be better prepared to the emerging threats, the NSSC has established the Design Basis Threat (DBT) and regulates nuclear facilities based on the DBT. This DBT is revised on a regular basis to incorporate the result of the NSSC’s assessment on the latest threats.

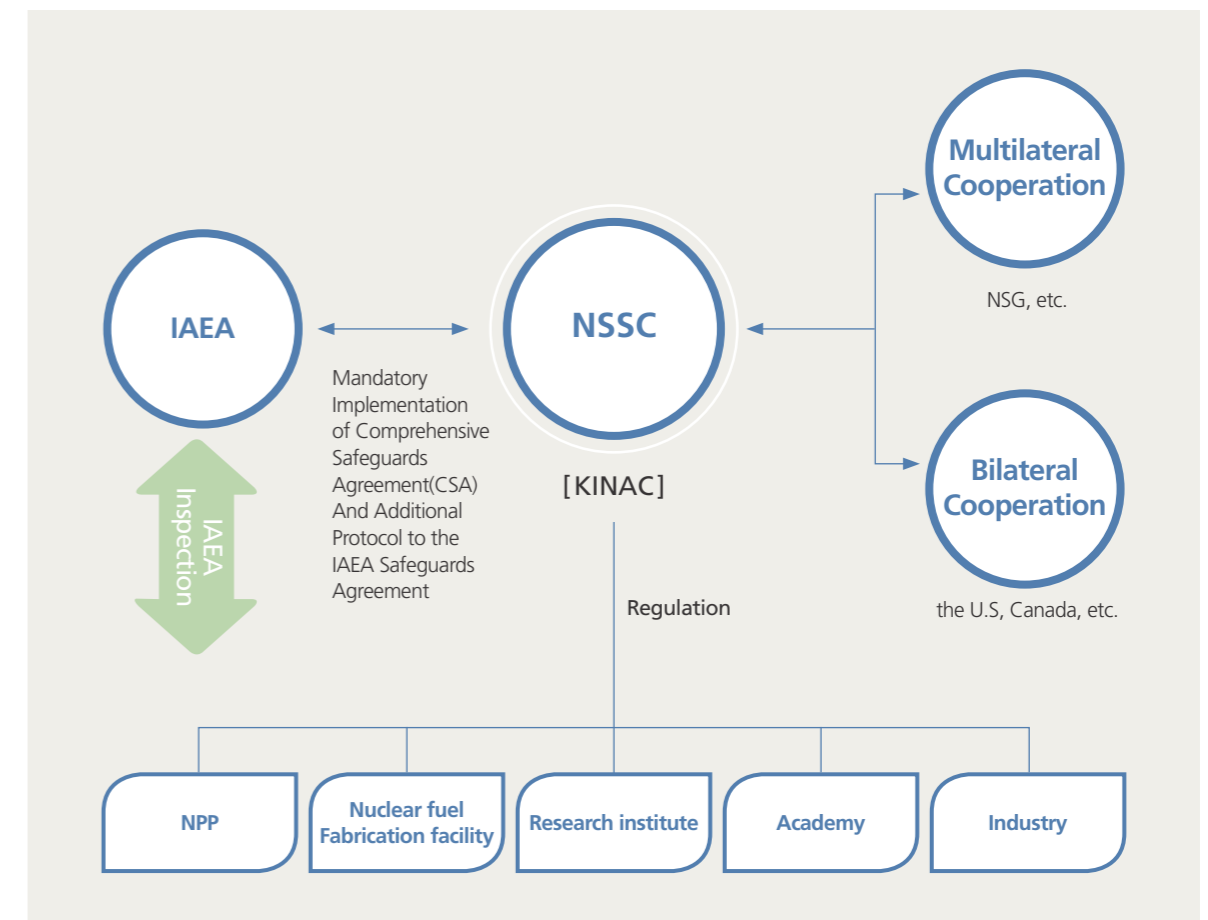
The NSSC’s regulatory activities of physical protection and cyber security on its licensees include the review of security plans, the inspection on physical protection system, the evaluation of incident response exercise, and the training of licensees’ security staffs. To enhance further preparedness for the nuclear terrorism and establish effective system respond to it, the NSSC develops technologies and frameworks for prevention, detection of and response to 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) signed in 2004. It makes the utmost efforts for ensuring ROK’s peaceful use of nuclear energy and enhancing nuclear transparency.

The NSSC is responsible for licensing the export of nuclear materials, equipment, facilities, and related technologies. It follows the Nuclear Suppliers Group (NSG) guidelines and other international norms on export control including United Nation Security Council Resolution (UNSCR) 1540. It issues the export license after examining whether the export items or technology are classified as a strategic item and after checking the end-use/user. For the rational and efficient regulation, Nuclear Export Promotion Service (NEPS), a one-stop e-licensing system, is in operation. 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, 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-how 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 has increased communication channels connecting with the regional residents and discloses a variety of information on nuclear regulation.

Nuclear Safety Councils are set up at each nuclear power plant site including Kori, Hanbit, Hanul and Wolsong. With the participation of local residents and regional experts, the councils meet to discuss regional concerns about nuclear safety and collect local residents' opinions and feedback.

Information on nuclear regulatory activities and nuclear safety is disclosed in a prompt and transparent manner through various channels including the NSSC's official website (<http://nssc.go.kr>), blog (<http://blog.naver.com/prnssc>) and SNS (<https://twitter.com/NSSCKorea>, <https://www.facebook.com/prnssc>).

The NSSC opened a Nuclear Safety Information Center (<http://nsic.nssc.go.kr>), an on-line portal on nuclear safety information, in June 2016. The public can access NSIC to information on nuclear safety, radiation safety, real-time environmental radiation, nuclear power plant accidents and failures, etc.

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

All nuclear safety information produced in the NSSC should in principle be disclosed to the public. Against this backdrop, the NSSC ensures transparent decision-making process for nuclear safety policy, expands communication channels with residents living near nuclear power plants and discloses a variety of nuclear regulatory information to the public. 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 admitting the public to the meetings of the Commission, disclosing stenographic records of the meetings and preserving meeting recordings.

Nuclear Safety Policy Coordination Committee	<ul style="list-style-type: none"> <li>Coordinate nuclear safety-related policies and issues at the central government level, participated in by high ranking officials from the related ministries</li> </ul>
Nuclear Safety Council	<ul style="list-style-type: none"> <li>Hold quarterly meetings with the Council members of each NPP site consisting of residents, local governments and the NSSC</li> <li>Provide information to the local residents and discuss mutual interests</li> </ul>
Nuclear Safety Information Center	<ul style="list-style-type: none"> <li>Provide safety data such as review and inspection reports on NPPs in operation or under construction</li> </ul>
Nuclear Safety Ombudsman	<ul style="list-style-type: none"> <li>Establish prevention system against corruptive actions and irregularities in nuclear industry</li> <li>Provide financial compensation to whistleblower based on the investigation results of each case</li> </ul>

## Cooperation in General

The NSSC undertakes a broad range of overseas collaborative activities such as technical research, sharing of information, and exchange of experts, which is focused on the improvement of nuclear safety, security and nonproliferation. Further information is available at [www.nssc.go.kr](http://www.nssc.go.kr), (phone) +82 2 397 7271, (fax) +82 2 397 7393.

## Cooperation with International Organizations

As part of an effort to strengthen cooperative partnership with international organizations such as the IAEA, the OECD/NEA, etc., the NSSC has actively participated in a variety of international conferences, experts' meetings and working groups. Therefore, the NSSC has significantly contributed 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 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 with common interest.

For more practical and cooperative activities, the TRM formed three working groups, which are aimed at facilitating On-line Information Sharing (OIS), Human Resource Development (HRD) and Emergency Preparedness & Response (EPR), and annually holds joint emergency drill by 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 U.S. on nuclear safety technology, regulatory standards and joint research by holding annual steering committee meetings.

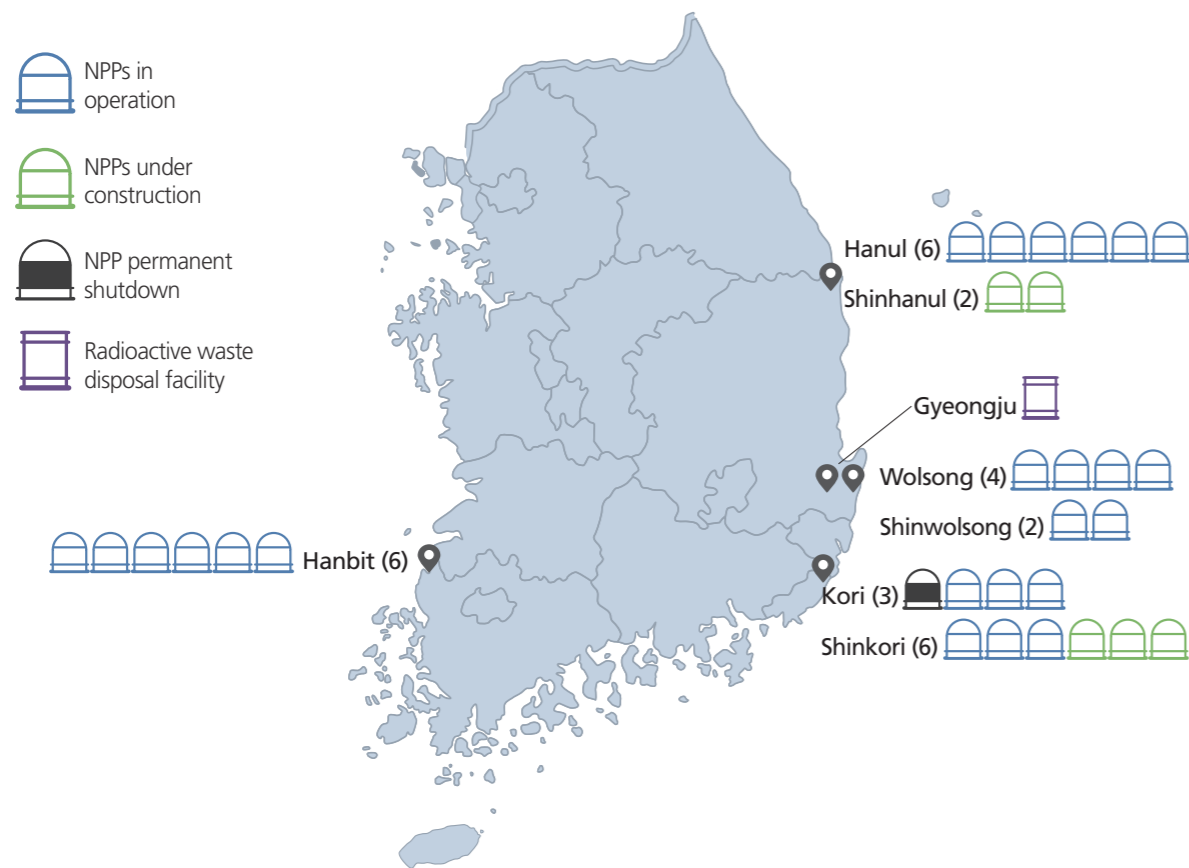
## Cooperation with Embarking Countries

The NSSC is actively engaging in cooperation with late comers in 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, knowledge transfer and etc.

## Major Statistics

### Facility Status

Type		No.	
Nuclear reactor	Power generating reactor	In operation	24 Korea Hydro and Nuclear Power Co., [Kori (3), Shinkori (3), Wolsong (4), Shinwolsong (2), Hanu (6), Hanbit (6)]
		Under construction	5 Korea Hydro and Nuclear Power Co., [Shinkori (3), Shinhanul (2)]
	Research reactor	1	Korea Atomic Energy Research Institute[Hanaro]
	Education reactor	1	Kyunghee University[AGN-201]
Nuclear fuel cycle facility	Nuclear fuel fabrication facility	1	Korea Atomic Energy Research Institute [Research reactor nuclear fuel fabrication facility]
		2	KEPCO NF [NPP nuclear fuel fabrication facility]
	Spent nuclear fuel processing facility	1	Korea Atomic Energy Research Institute [Research on spent nuclear fuel]
Intermediate and low level radioactive waste disposal facility		1	Korea Radioactive Waste Agency
Radiation-using organizations		8,314	Organizations producing, selling and using radioactive isotopes and radiation generating devices



## Major Statistics

### Nuclear Power Plants

Site	Kori	Wolsong	Hanbit	Hanul	Total
Unit	6 (3)	6	6	6 (2)	24 (5)
Capacity (MWe)	5,950 (4,200)	4,779	5,900	5,900 (2,800)	22,529 (7,000)

\* Figures in parenthesis indicate the number of reactors under construction.

\* Shinkori, Shinhanul, Shinwolsong units are included in the categories of Kori, Hanul and Wolsong, respectively.

### Safety Management Facilities

#### • Unmanned environmental radiation monitoring system

In total, 171 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)

### Radiation-using Organizations

Type	Industrial Organization, etc.	Medical Organization	Education and Research Organization	Total
Unit	7,488	195	631	8,314

\* Increase in number of organizations : 1,692 (2000) → 2,723 (2005) → 5,155 (2011) → 5,606 (2012) → 6,085 (2013) → 6,612 (2014) → 7,024 (2015) → 7,474 (2016) → 7,938 (2017) → 8,314 (2018)

### 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
VIETNAM (VARANS)	Sept. 15, 2015	CHINA (NNSA)	Nov. 26, 2015
K.S.A (K.A.CARE)	Nov. 22, 2016	RUSSIA (RTN)	Sept. 19, 2018
THAILAND (O.A.P)	Sept. 19, 2018		