

We have expanded the scope of our business from South Korea to Southeast Asia, the Middle East, and North Africa.
We promise to offer satisfaction to our customers by delivering high-quality products
based on rich experience and the best technologies.

Global NO.1 I&C Total Solution Provider

SOOSAN *ENS*

Construction & Commissioning

Nuclear

Thermal

MMIS

R&D

Global NO.1 I&C Total Solution Provider

SOOSAN *ENS*

A Total Engineering Service Provider that designs
and manufactures nuclear MMIS and devices
for domestic and overseas plants and
performs I&C construction, testing,
and maintenance

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SOOSAN GROUP MOTTO



SOOSAN

Finding worth from our
efforts and your wisdom...

The SOOSAN family pursues a corporate culture that leads the efforts to 'act before others' and to 'learn the wisdom of others.' SOOSAN GROUP is working to find worth from our efforts and your wisdom. All employees of SOOSAN GROUP share their efforts, wisdom, and worth with one another.

History

No. 1 company in Korea for operational maintenance of nuclear and thermal instrumentation control facilities
Korea's only maker of nuclear safety grade controllers

1970~1989's

challenge

- 1974. 05. Founded Samchang Enterprise
- 1988. 04. Registered the specialized service business
- 1989. 09. Demonstrated operational maintenance for instrumentation control at Kori Nuclear Power Plant Unit 1

1990~2000's

establish

- 1992. 05. Signed a long-term service contract for instrumentation control maintenance of nuclear power plants (9 operating units)
- 1992. 05. Founded the affiliated research center
- 1996. 05. Founded the control technology research center
- 1997. 02. Selected as a company qualified for making power generation facilities (KEPCO)
- 1998. 01. Obtained ISO 9001 certification (BVQI)
- 1998. 05. Obtained Korean technology (KT) mark for a technology to determine failure of electric circuit board for nuclear power plants
- 1999. 02. Selected as a company for maintenance of nuclear power instrumentation control facilities (KEPCO)

Intellectual Property

PLC "POSAF-Q," data transfer of controllers

Communication and protection simulation systems for nuclear power plants

Ultrasonic testing method of fuel rods, system, nuclear fuel storage, and movable table

Precise inspection and maintenance for electronic circuit boards of nuclear power facilities

2000~2009's

expansion

- 2001. 05. Localized the 10MW intelligent digital speed regulator
- 2002. 05. Selected as an excellent material supplier for nuclear power plants (KHNP)
- 2003. 07. Obtained nuclear safety mark (Ministry of Science and Technology)
- 2004. 07. Founded the nuclear research center and MMIS joint R&D center

2010~

globalization

- 2011. 08. Signed a nuclear business transfer contract (Samchang Enterprise & PONUTech)
- 2012. 02. Launched PONUTech
- 2012. 06. Transferred business rights for safety grade controller (PLC) of POSCO ICT
- 2013. 04. Obtained an order for instrumentation of Dangjin #1~4 from Korea East-West Power
- 2013. 12. Obtained OHSAS 18001 certification (first in the industry)
- 2014. 07. Obtained OHSAS 18001 certification (first in the industry)
- 2014. 09. Founded Abu Dhabi Branch Office in the UAE
- 2014. 10. Signed an MOU to form the 'nuclear decommissioning technology and industry' consortium
- 2015. 09. Signed a PLC contract for the MMIS of Shin Kori 5, 6 with Doosan Heavy Industries & Construction
- 2015. 11. Incorporated into SOOSAN GROUP (PONUTech → SOOSAN ENS)
- 2016. 02. Signed an MOU with Westinghouse, U.S.
- 2016. 02. Obtained orders for instrumentation of Samcheonpo #1~6, Yeosu #1~2 for Korea South-East Power and Hadong #5~8 for Korea Southern Power
- 2018. 04. Registered as a maintenance company of Westinghouse, U.S.
- 2019. 01. Founded Philippines Branch Office and obtained an order for testing (O&M) of Malaya Power Plant in the Philippines

Total Patents Trademarks Applications

68 50 + 13 + 5

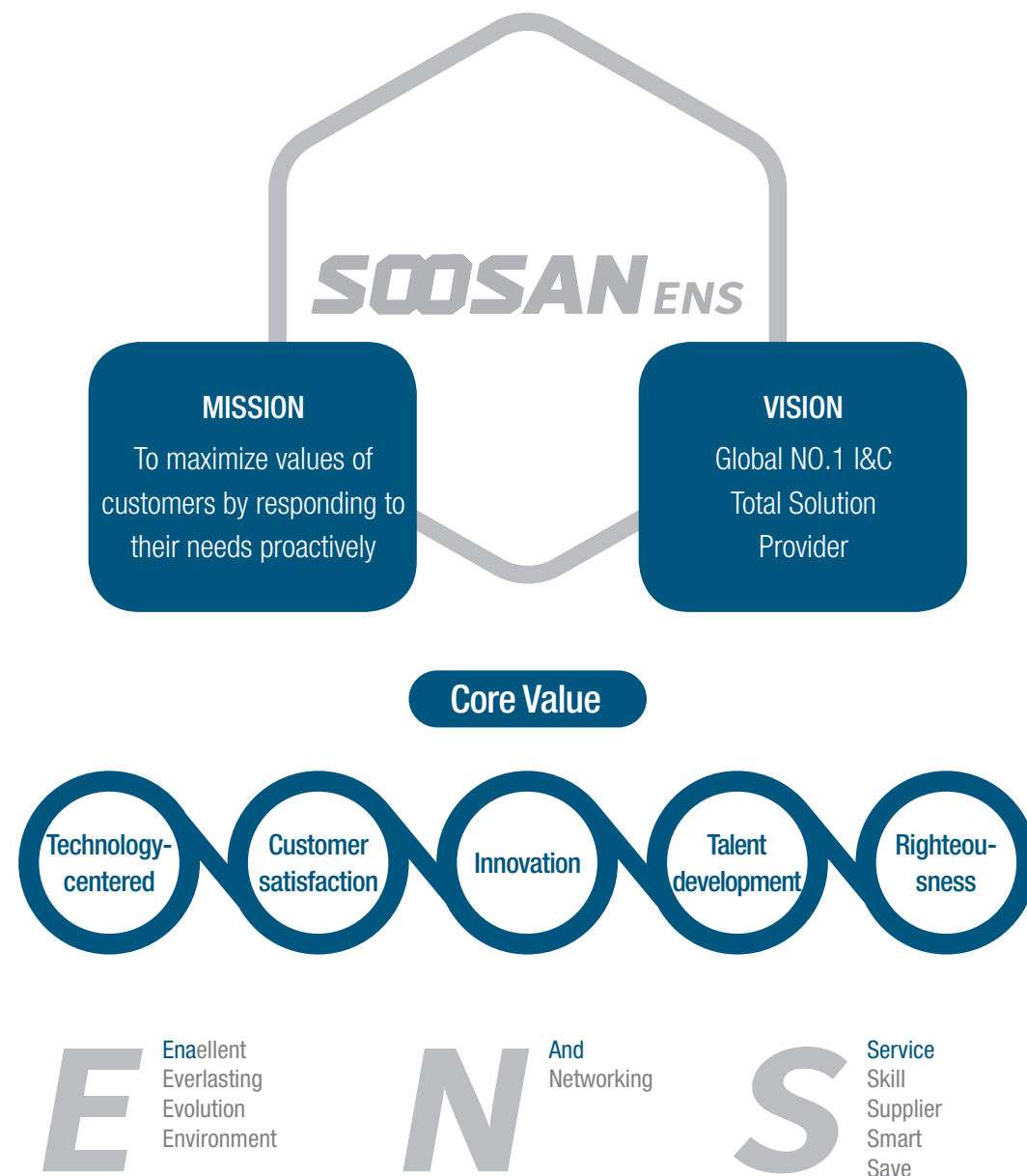
As of November 2019

Global NO.1 I&C Total Solution Provider
SOOSAN ENS

Overview

SOOSAN ENS, a company that enriches the world and makes dreams of cusatomers come true

Company name	SOOSAN ENS
Foundation	May 1974
Address	21, Maegoksaneop-ro, Buk-gu, Ulsan
Number of employees	551 persons (as of November 2019)
Tel	+82-52-258-3860
Fax	+82-52-258-3865
Website	www.soosanens.co.kr

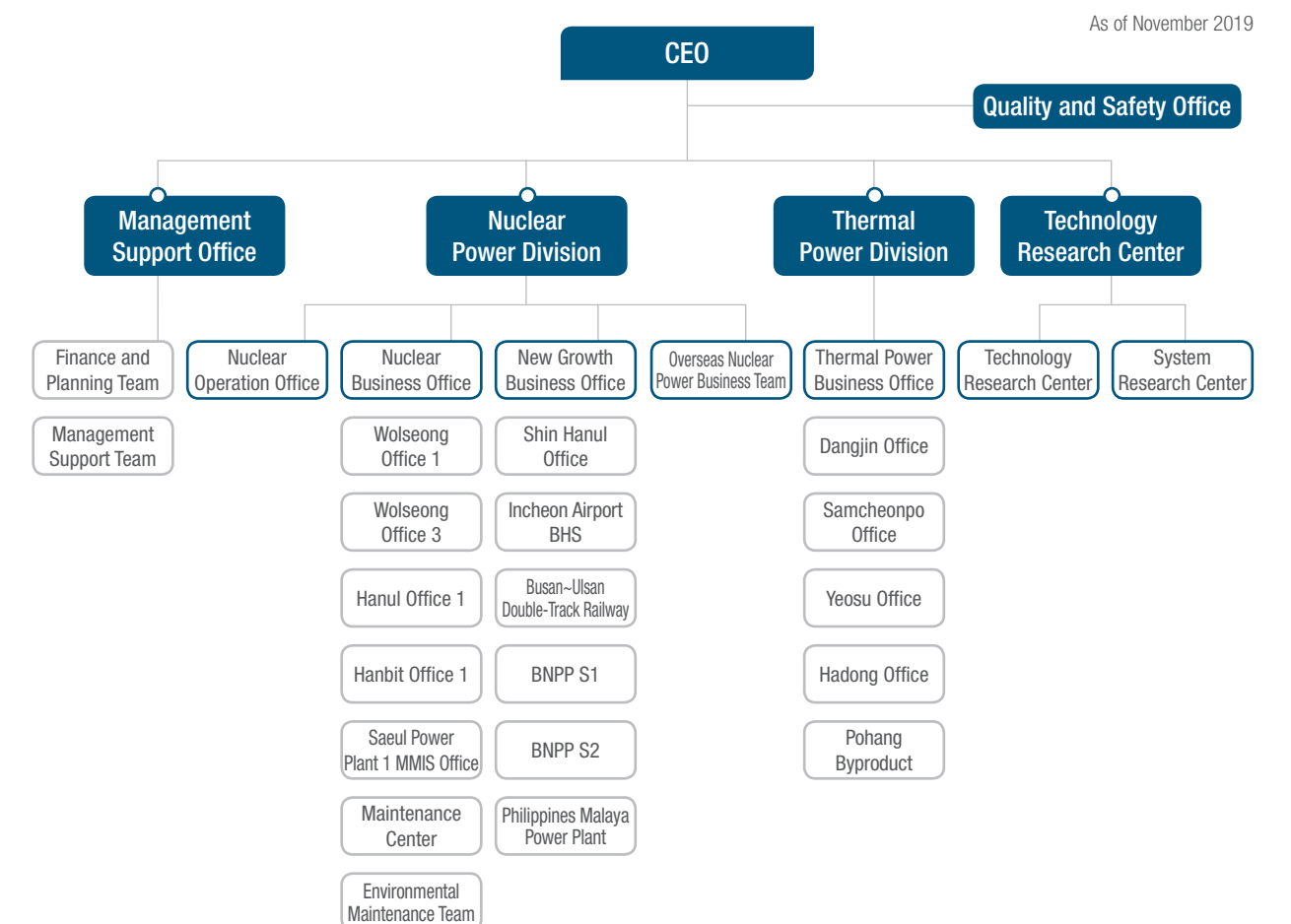


Number of Employees **551** persons As of November 2019

Licenses **780** licenses Electric, electronic, instrumentation, machinery, information/communication, quality, industry/safety, firefighting facility, dangerous article, radioactivity As of November 2019

Engineers **450** persons Applied electrics and electronics, electric facility, information and communication (registered with Korea Engineering & Consulting Association) As of November 2019

Organization Chart



Business Areas

SOOSAN ENS has proven its technologies and continued reliable business operations.
We open the future of technologies, from the maintenance of nuclear power plants to nuclear MMIS.

01 Nuclear Power

We maintain and manage instrumentation control facilities for nuclear reactors, turbines, and accessories for the safe and proper functioning of nuclear power plants.

02 Thermal Power

We maintain the reliability and performance of thermal power facilities and promote the safe operation of power plants through perfect preventive maintenance.

03 Domestic and Overseas Plants

We take part in projects of domestic and overseas plants.

04 R&D

We try to create new values through cutting-edge technologies and innovation.

Global NO.1 I&C Total Solution Provider



Main feedwater pump turbine



Radiation monitoring system (RMS)



Nuclear fuel testing equipment



Thermal and industrial plants



Environmental plants



Nuclear power plants



Overseas projects



JRTR MMIS machinery and instrument supply



Environment and radiation monitoring system (ERMS)



OH construction and simple construction



ILRT



Maintenance of instrumentation control facilities



PIMS

SOOSAN ENS

1 Nuclear

SOOSAN ENS maintains and manages instrumentation control facilities of nuclear reactors, turbines, and accessories to ensure the safe and proper operation of nuclear power plants. It has created an integrated maintenance system that undergoes cleaning of electric circuit boards, removal of coating, precise testing, In Circuit Test (ICT), replacement of failed parts, and quality control (QC) process.



Specializing in instrumentation and control (I&C) maintenance

Instrumentation maintenance on all reactor types in South Korea – WEC, Framatome, CANDU, OPR-1000, APR-1400

Reactor control facilities

Rod control facility, internal and external nuclear instrumentation monitoring system, CPC, nuclear NSSS integrity management system (NIMS)

Turbine control facilities

Turbine control system (TCS), main steam and feedwater shutoff valve, main feedwater pump, and main feedwater control valve

Computation control facilities

Engineering safety system (ESFAS), reactor protection system (RPS), radiation monitoring system (RMS)

Man-Machine Interface System (MMIS)

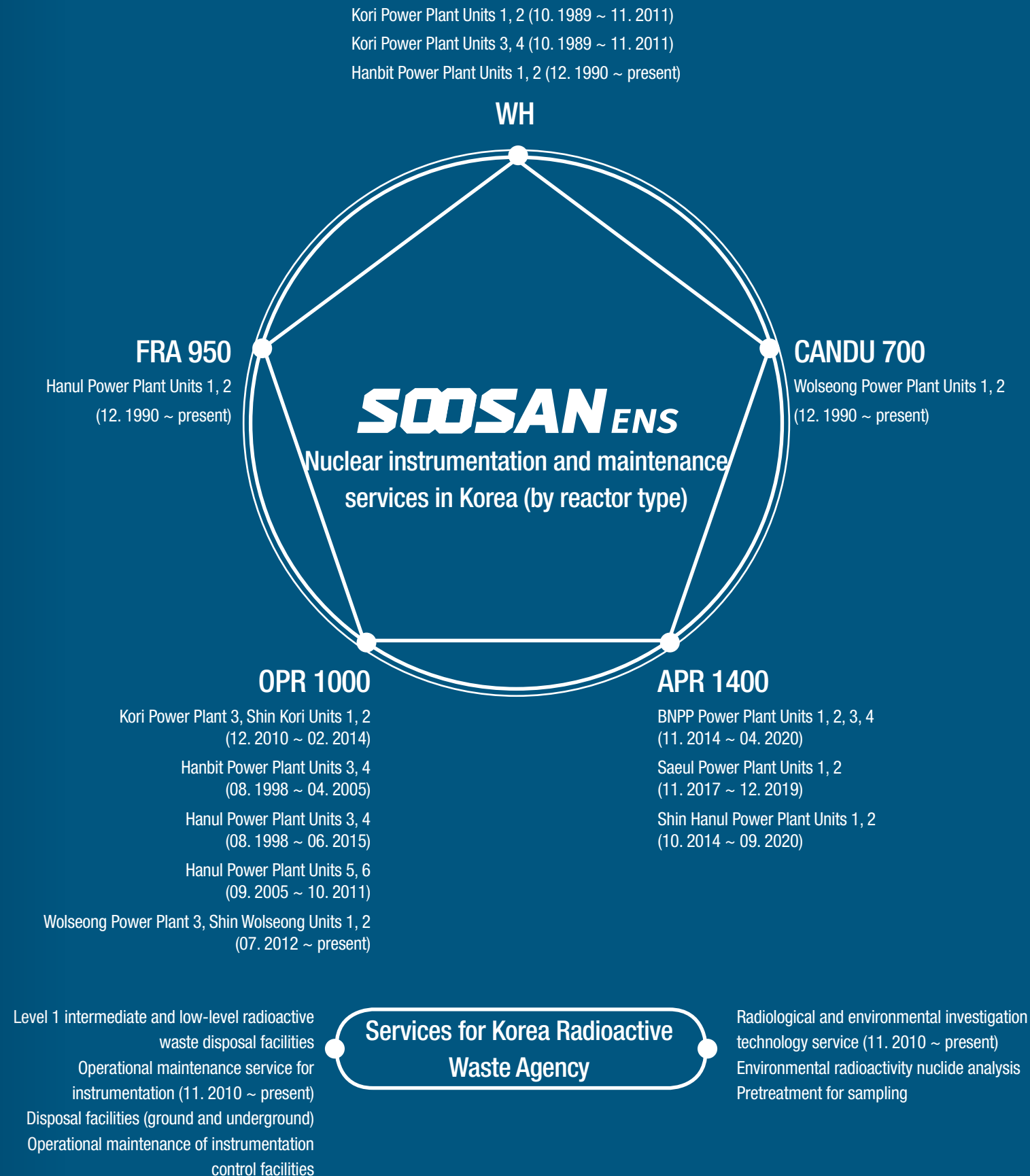
Safety and non-safety control system, main control room, operation control panel, LDP

Integrated Leakage Rate Test (ILRT)

Leakage rate test for nuclear power plant containment buildings

PIMS

PCB Integrated Maintenance Service



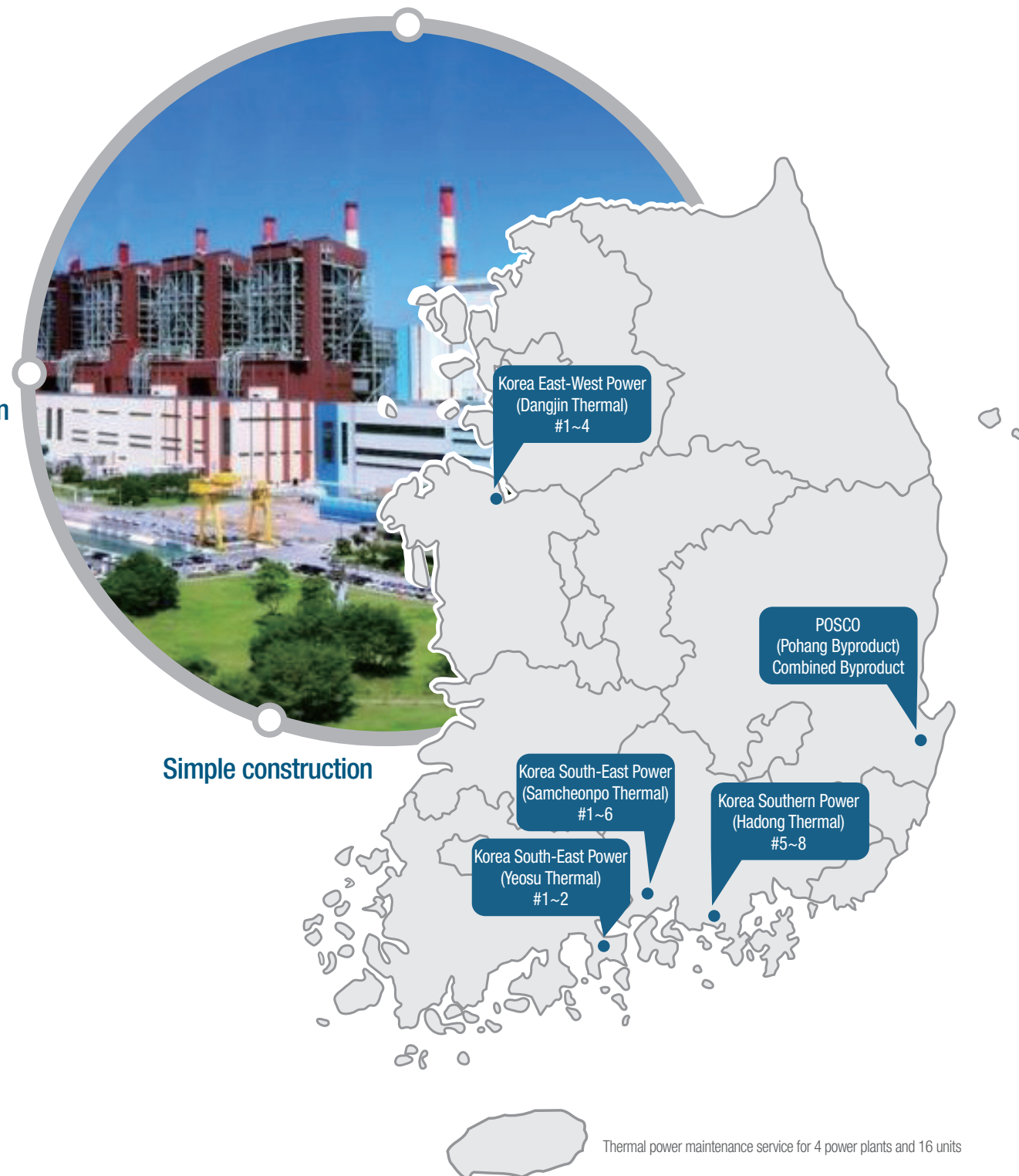
2 Thermal

Maintenance service for I&C facilities of private and public thermal power plants
Operational I&C maintenance service at thermal power plants
Planned preventive maintenance work and simple construction for thermal power plants

Operational maintenance service for I&C facilities

OH construction

Simple construction



Operational maintenance service for instrumentation control facilities

Efficient operation of maintenance personnel using advanced instrumentation control technologies
Securement of facility reliability and contribution to the stable power supply through professional maintenance
Increased operation rate of power plants through complete maintenance of instrumentation control facilities

Duties

Operational maintenance duties such as periodic preventive maintenance, inspection, testing, and analysis of instrumentation control facilities
Handling of work request and failure repair request (TM)
Emergency restoration of failed power generation facilities
Periodic reporting
Technology development and quality control
Safety and security management

OH construction and simple construction

Enhancement of facility reliability and maintenance of performance through perfect preventive maintenance
Attainment of zero-failure operation and stable operation of power plants

Duties

Standard work: Correction, inspection, and testing of facilities and instruments specified in the design
Non-standard work: Installation and testing according to the specification, design, and operational and maintenance guidelines using materials supplied by the ordering body

Business outcome

Operational maintenance service for instrumentation control facilities

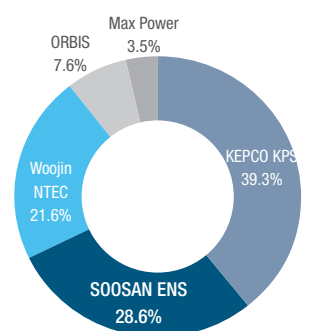
Operational maintenance service for I&C facilities of Hadong Thermal Power Plant Unit 8
Operational maintenance service for I&C facilities of Boryeong Thermal Power Plant Unit 6
Operational maintenance service for I&C facilities of Incheon Thermal Power Plant Units 1~4
Operational maintenance service for I&C facilities of Seocheon Thermal Power Plant Units 1~2
Operational maintenance service for I&C facilities of Samcheonpo Thermal Power Plant Units 1~6
Operational maintenance service for I&C facilities of Yeosu Thermal Power Plant Units 1~2
Operational maintenance service for I&C facilities of Dangjin Thermal Power Plant Units 1~4
Operational maintenance service for I&C facilities of Yeongheung Thermal Power Plant Units 5~6
Operational maintenance work and wastewater treatment facility service for Chuncheon Energy (instrumentation)

Electric/instrumentation work and testing

Electric/instrumentation maintenance service for Pohang Byproduct Plant of POSCO
Testing of Gwangyang LNG 5 Tank of POSCO

Planned preventive maintenance work

Planned preventive maintenance work for I&C facilities of Hadong Thermal Power Plant #1~6
Planned preventive maintenance work for I&C facilities of Boryeong Thermal Power Plant #1~8
Planned preventive maintenance work for I&C facilities of Incheon Thermal Power Plant #1~4



[Operational maintenance market]

3 Domestic and Overseas Plants

SOOSAN ENS takes part in plant projects of Korea and overseas. In particular, we conduct testing and maintenance of domestic and overseas nuclear power plants of the APR1400 model and O&M business for overseas plants.



Construction and testing

Electric instrumentation and testing of nuclear and thermal power plants
Electric instrumentation and testing of industrial plants

Comprehensive testing

Coal, combined cycle plant, renewable energy
Integrated testing for machinery, electric, instrumentation, and chemical fields

O&M

Correction and performance testing
Predictive maintenance, periodic maintenance
Planned preventive maintenance
DCS operation
Field operation
Security and environmental management



O&M for Malaya Thermal Power Plant in the Philippines



I&C commissioning S1, S2 for Baraka Nuclear Power Plant in the UAE

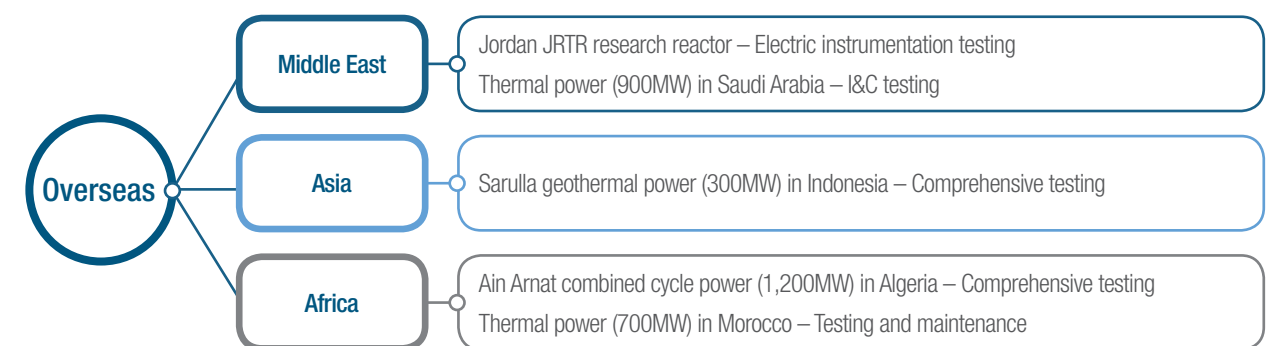
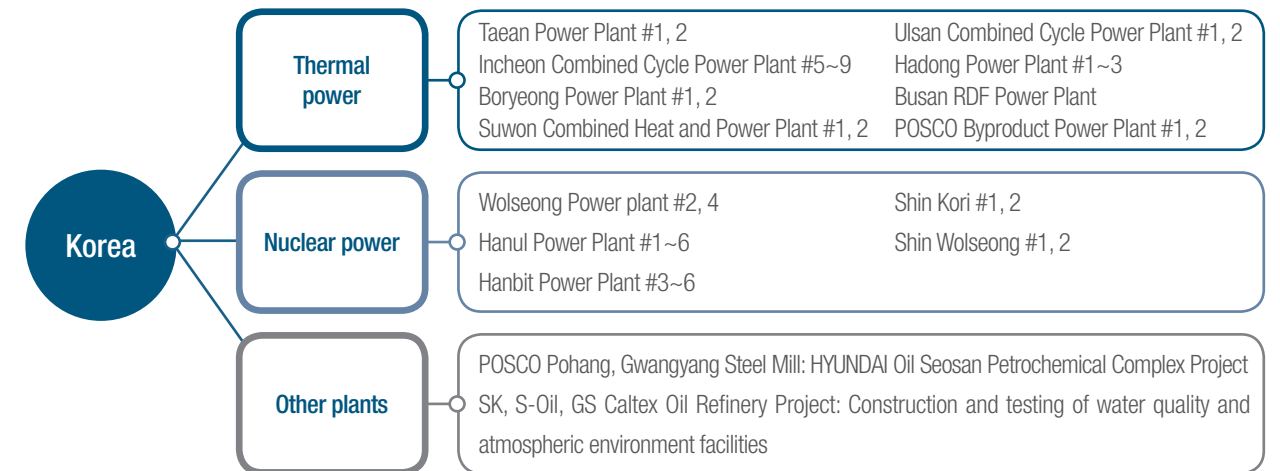


I&C commissioning for Thermal Power Plant in Saudi Arabia

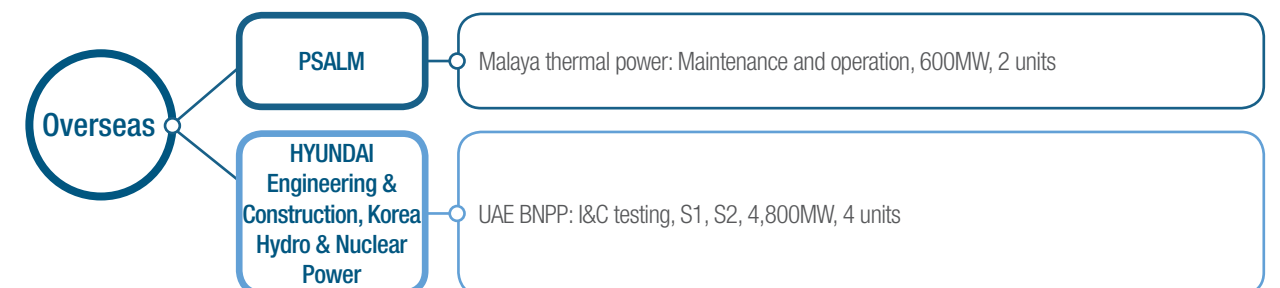


Total commissioning for Sarulla Geothermal Power Plant in Indonesia

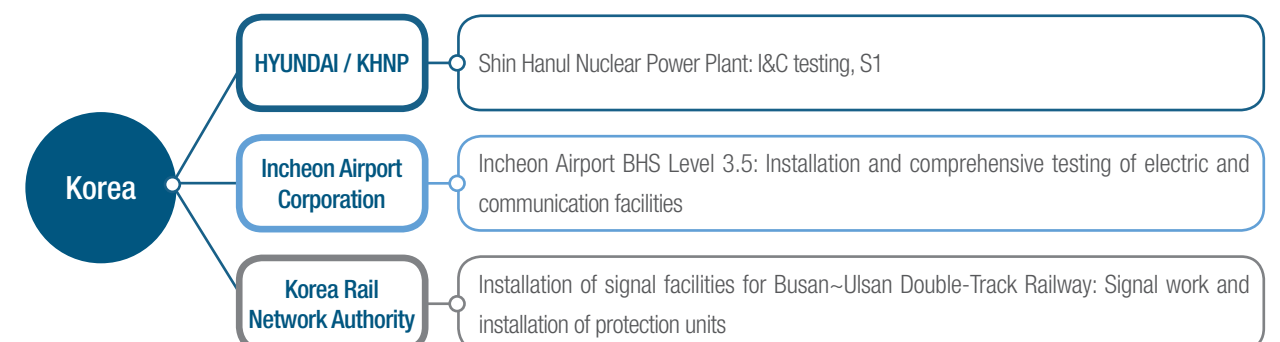
Construction and testing in Korea



Operation and maintenance



Construction



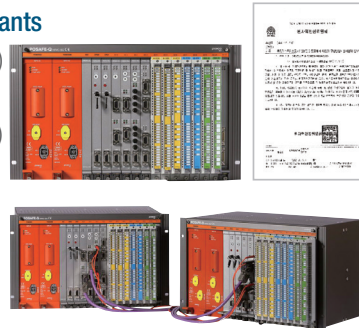
4 R&D

R&D

SOOSAN ENS tries to create new values through cutting-edge technologies and innovation. It is prepared with an independent business capability to provide a total service.

Development and supply of MMIS (POSAFE-Q) for nuclear power plants

- Obtained KINS approval for safety grade controller (POSAFE-Q) (February 2009)
Localized (commercialized) Korea's first nuclear safety grade controller
- Obtained KINS approval for POSAFE-Q dualization technology (January 2012)
- Supplied MMIS for Shin Hanul #1, 2
- Upgraded the version of POSAFE-Q for Shin Kori #5, 6
- Supplied MMIS for Shin Kori #5, 6
- Developed multiplex controller for next-generation MMIS



Supply of MMIS for research and training nuclear reactors

- JRTR Man-Machine Interface System (MMIS)

- Supplied MMIS for research and training nuclear reactors and constructed auxiliary facilities in Jordan
- Provided operational training and technical support



- Ki-Jang Research & Training Reactor (KRTR) MMIS

- Provided MMIS design, instrument, and testing
- Provided operational training and technical support

Supply of System Integrated Modular Advanced Reactor MMIS

Designed, manufactured, and verified MMIS

Supply of Spent Fuel Inspection System (SFIS)

Spent fuel assembly inspection system for nuclear power plants

Business outcome

Improved: Hanbit Power Plant 1

New : Kori Power Plant 1, Hanul Power Plant 2, Hanul Power Plant 3,
Hanbit Power Plant 3, Wolsong Power Plant 3,
Shin Kori Power Plant 1, BNPP #1~4, NPIK, KEPCO Nuclear Fuel (KNF)



Development of multiplex controller for next-generation MMIS

Controller with a triple structure

Dualized bus module

Output module with a voting structure

Developed an engineering tool for dualization of the power module



Development of NSSS Integrity Monitoring System (NIMS)

An integrated online diagnosis system for structural integrity monitoring of nuclear reactors and pressure range of nuclear reactors

Radiation Monitoring System (RMS)

RMS monitors the radiation level of nuclear power systems and certain areas to control radiation exposure of workers and prevent leakage of radioactive substances. It comprises a field monitor that includes a detector and a central computing device.

Targets

Nuclear power plants, nuclear-related facilities

Business outcome

RMS for Shin Kori #1, 2 / RMS for Shin Wolsong #1, 2

Supply and installation of RMS computer for Kori #3, 4 / Supply and installation of RMS computer for Kori #3, 4

Environmental Radiation Monitoring System (ERMS)

Environmental radiation refers to the natural radiation of the earth and artificial radiation emitted by nuclear testing and nuclear power facilities. ERMS measures, stores, and analyzes environmental radiation in the air at nuclear power plants or special facilities. If there are changes in environmental radiation, ERMS can determine whether such changes are caused by natural radiation (heavy rain or spacecraft) or artificial radiation.

Targets

Nuclear power plants, radioactive waste treatment plants, other nuclear-related facilities

Business outcome

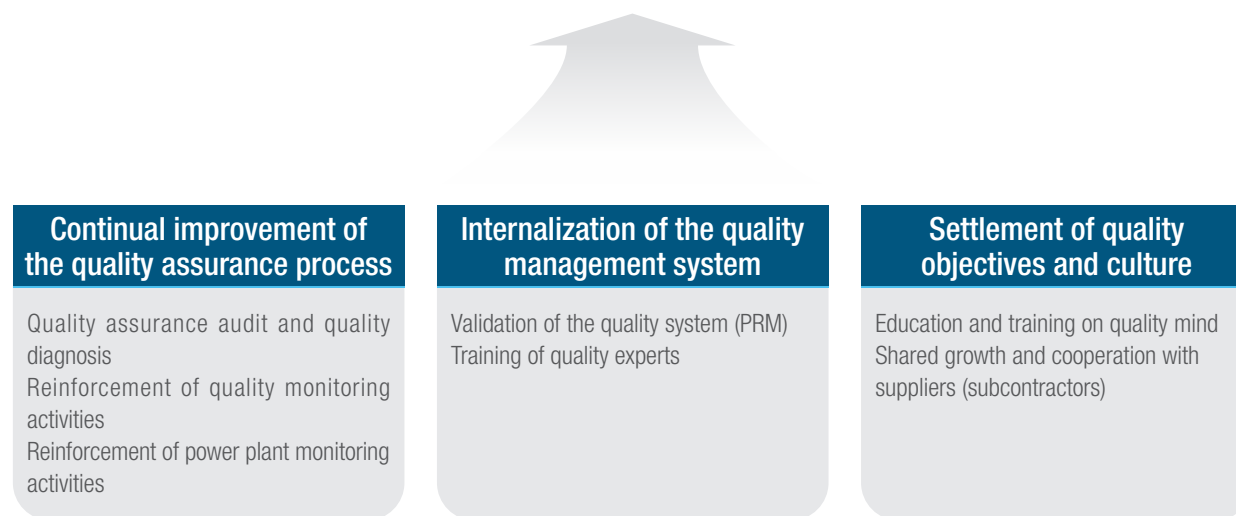
ERMS for Kori Nuclear Power Plant / ERMS for Hanbit Nuclear Power Plant

ERMS for Hanul Nuclear Power Plant / ERMS for Radioactive Waste Plant

ERMS for Yeonggwang-gun Private Monitoring Center / ERMS for Heavy Ion Accelerator (Daejeon)

Quality and Safety Management

To optimize quality and internalize the quality assurance system according to the basics and principles



To achieve zero safety accident through safety activities based on human respect



※ SAO: Safety Acts Observation

Talent Development

SOOSAN SAT Program

Applied SAT (global training manual) to all nuclear power plants in the United States after the TMI nuclear accident
 BNPP Operator Qualification Regulation (FANR-RG-17), IAEA, INPO-ACAD-85-006
 Developed and submitted the SAT process for "Saeul Power Plant 1 Instrumentation Maintenance Service Design" in Korea



SOOSAN Human Resource Institute

Purpose of foundation	To conduct OJT and maintenance education of SOOSAN GROUP
Foundation date	December 2016
Scale	One basement floor and three ground floors (land: 8,925m ² / building: 2,500m ²)
Facilities	Professional education facilities including lecture room, machine practice room, and large lecture hall Operating auxiliary facilities including 31 residence buildings and cafeteria
Address	11-10, Chunghyo 6-gil, Gyeongju-si, Gyeongsangbuk-do (Chunghyo-dong)
Occupancy	Up to 160 persons



Network



Division	Region	Department
Head Office	Ulsan	Management Support, Business Support, Quality Safety, Nuclear Operation, Maintenance Center
Technology Research Center	Seoul (Suseo)	Technology Research Center, System Research Center
	Ulsan	Saeul Power Plant 1 MMIS Office (nuclear MMIS maintenance)
	Gyeongju	Wolseong Power Plant 1 / Wolseong 3 Office (nuclear operation) / Environmental Maintenance Team
	Ulsan	Hanul 1 Office (nuclear operation) / Shin Hanul Office (testing)
	Yeonggwang	Hanbit 1 Office (nuclear operation)
	Incheon	Incheon Airport BHS (testing and construction)
Thermal Power Division	Dangjin	Dangjin Office (thermal operation)
	Samcheonpo	Samcheonpo Office (thermal operation)
	Hadong	Hadong Office (thermal operation)
	Yeosu	Yeosu Office (thermal operation)
	Yeosu Office (thermal operation)	Pohang Combined Byproduct Plant, maintenance (testing, thermal operation)



Global NO.1 I&C Total Solution Provider

SOOSAN
ENS

No. 1 in Korea for operational maintenance
of nuclear and thermal I&C facilities
The only company in Korea that makes
nuclear safety grade controllers

A company specializing in manufacture of special
equipment and construction machinery

SOOSAN
CSM

No. 1 domestic market share for hydraulic drills and
elevated work platforms
No. 1 exporter of hydraulic drills (40 nations)
Domestic market share of 90% for elevated work platforms



SOOSAN

Korea's first private maintenance company
capable of performing maintenance on all
nuclear and thermal power facilities



A leader of nuclear and thermal power plant maintenance

SOOSAN
INDUSTRIES

Korea's first private maintenance company
capable of performing maintenance on all
nuclear and thermal power facilities

Global Major Solar Power Corporation

SOOSAN
SH POWER

A global green energy company that
uses solar power technologies



A global company for heavy construction equipment

SOOSAN
HEAVY INDUSTRIES

Korea's first company to sell over 100,000 breakers
No. 5 global market share for breakers among independent brands
No. 1 domestic market share for breakers and truck-mountable cranes



A company that manufactures and sells polymer condensers

SOOSAN
ENESOL

First in the world to have polymer capacitor production technology
First in Korea to commercialize polymer capacitors
The only company in Korea to manufacture and sell polymer capacitors



A company specializing in network security solutions

SOOSAN
INT

First in Korea to develop internet traffic filtering solutions
The only company in Korea to supply exclusive shared
device service for three telecommunication companies
First in Korea to provide network-based filtering service



A company that manufactures and sells gas
sensors and leak alarms

SOOSAN
HOMETECH

A company that manufactures and sells gas sensors and leak alarms