



WITH YOU HANBIT



Our company, after having commenced our business as an engineering company in the area of electrical engineering, are striving to put efforts to become an integrated and specialized engineering company with business areas including electrical, civil engineering, construction and machinery on the basis of the experiences accumulated while executing an extensive range of power generation related projects.

We are steadfastly advancing towards the status of an outstanding company capable of executing a wide range of services ranging from design, supervision and testing of various devices, through to commissioning on the basis of resolute faith and reliability as we are equipped with extensive experience and expert engineers skilled in the areas of electricity and automatic control of industrial and construction facilities.

Meanwhile, we are proud that we are making advances in our works including analysis and diagnosis of various electrical systems and disasters through our specialization in the area of safety diagnosis of electrical facilities by means of unsparing investment and education.

We shall continue to ardently put efforts into the foundation of sincerity, spirit of challenge and creativity. Accordingly, we seek your continued interest and guidance.

President & CEO Moon-sig Kang

COMPANY HISTORY

2010's

2016

SMEs innovation certification(MAIN-BIZ)
Electrical surveillance business registration
- General surveillance business (Seoul S-1-441)

2015

Registered as 5 Power Plant Companies qualified maintenance company
ISO 14001:2009 Recognition acquired

2014

ISO 9001:2008 Recognition Change

2013

Agreement partnership with SK E&C
Agreement partnership with SAMSUNG ENGINEERING

2012

Registered as Engineering business license
Agreement partnership with HYUNDAI ENGINEERING
Registered as Manufacturing business license
Agreement partnership with DAELIM INDUSTRIAL
Agreement partnership with HYOSUNG

2011

ISO 9001:2008 Recognition Change
Registered as KOMIPO qualified maintenance company
Registered as KOWEPO qualified maintenance company
Registered as KOSPO qualified maintenance company
Registered as KOEN qualified maintenance company
Patent application
- Method of power measurement and Power instrument

2010

Increase the capital amount as US\$700,000
Registered as Energy Saving Specialized Company (ESCO)

COMPANY HISTORY

2000's

2009

Registered as EWP qualified maintenance company
Registered as Agency - ABB Korea

2008

SMEs innovation certification(INNO-BIZ)
Patent application
- Circuit breaker with the passing heat cutoff function
Registered as the renewable energy company
Registered as Korea Gas Technology Corporation partner
ISO 9001:2008 Recognition acquired

2007

The company name was changed into HanbitPowerTech Inc.

2006

New technology design treaty / KD POWER Inc.
Industry – University Collaboration / Korea Polytechnics

2005

Company name was changed to Woongbi Inc.
after merging Chegim electrical Inc.
Electrical construction business registration (Kyungbuk-00888)

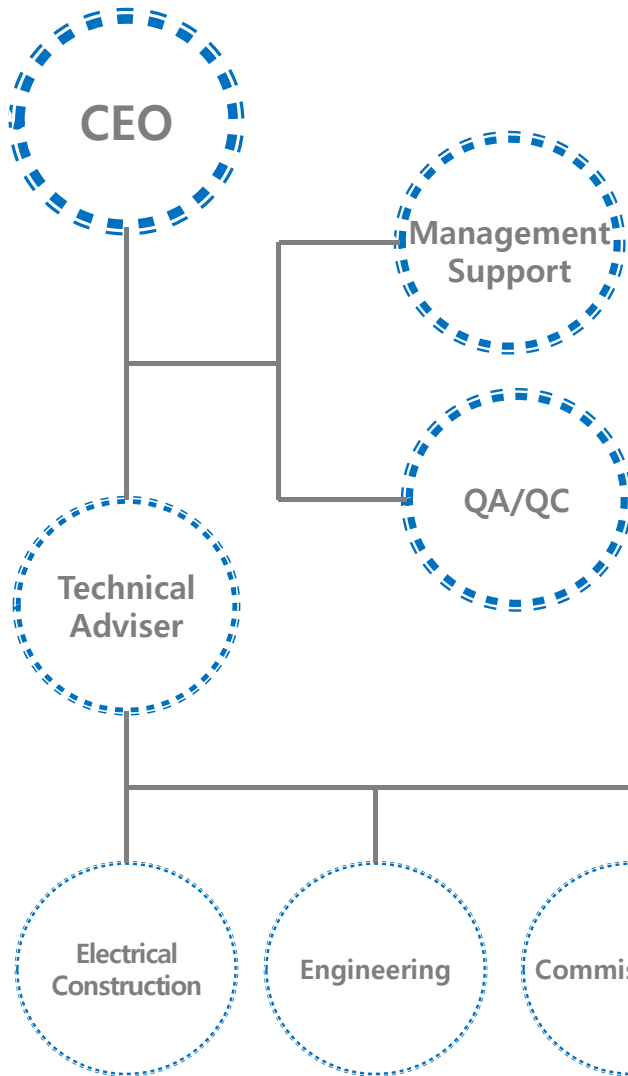
2004

Electrical surveillance business registration
- Specialized surveillance business (Seoul S-2-232)
Electrical design business registration
- Professional design business (Seoul E-2-270)

2003

The establishment of Woongbi engineering
Professional Engineers office opened/Power distribution

ORGANIZATION CHART



Electrical Construction Team	Engineer : 4
Engineering Team	Engineer : 4
Commissioning Team	Engineer : 28
Design & Survey Team	Engineer : 5
Panel Manufacture Team	Engineer : 3
Green Energy Team	Engineer : 3

CERTIFICATES

Superior HANBIT



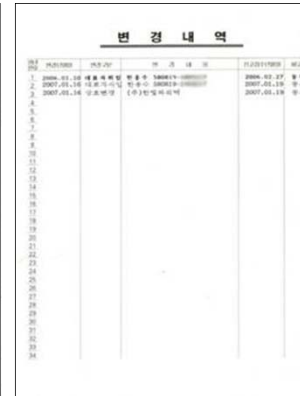
BUSINESS
LICENSE



PROFESSIONAL
ENGINEER OFFICE
OPENING



ELECTRICAL
CONSTRUCTION
BUSINESS -1



ELECTRICAL
CONSTRUCTION
BUSINESS -2



DESIGN
BUSINESS
REGISTRATION



SUPERVISION
REGISTRATION



RENEWABLE
ENERGY
ENTERPRISE
REGISTRATION



LICENSE OF
BUSINESS ESCO



PLANT
REGISTRATION



ISO 9001-2008

CERTIFICATES



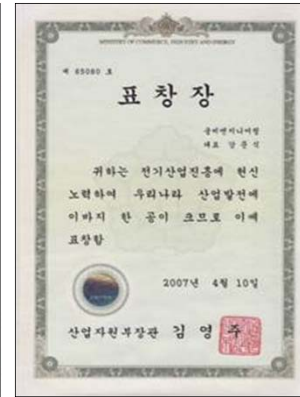
PATENT - MOLDED
CASE CIRCUIT
BREAKER



PATENT - MOLDED
CASE CIRCUIT
BREAKER



PATENT - POWER
INSTRUMENT



CITATION



R&D Department



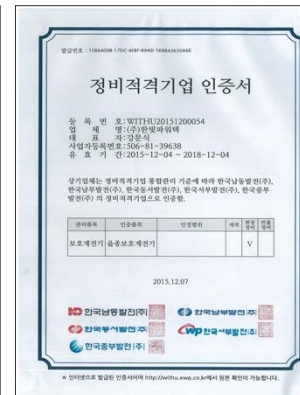
INNO-BIZ



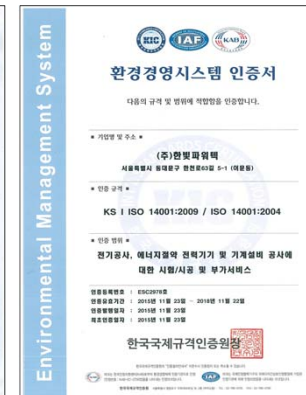
MAIN-BIZ



5 POWER PLANT
COMPANIES QUALIFIED
MAINTENANCE COMPANY-1



5 POWER PLANT
COMPANIES QUALIFIED
MAINTENANCE COMPANY-2



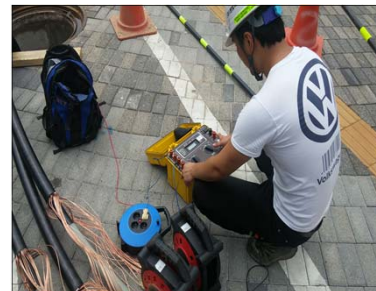
ISO 14001:2009

Superior HANBIT



ENGINEERING Commissioning Test

- ◎ Review for Documents & Drawings
- ◎ Protection Relay Function Test
- ◎ CT Characteristic Test (Turn Ratio, Knee Point, Polarity and Insulation Resistance)
- ◎ PT Characteristic Test (Turn Ratio, Polarity and Insulation Resistance)
- ◎ Circuit Breaker Operation Test (Close Time, Open Time, Time Difference Phase to Phase, Insulation Resistance, Vacuum Test, Contact Resistance)
- ◎ Transformer Characteristic Test (Vector Group, Turn Ratio, Polarity and Insulation Resistance, %Impedance)
- ◎ Insulation Oil Characteristic Test Hipot, Acid Value)
- ◎ Mechanical Protection Devices Interlock Test
- ◎ AC/DC Sequence Test
- ◎ Cable Hipot Test
- ◎ Measuring Grounding Resistance



ABOUT EXPERIENCE

Commissioning Test

Jangmoon CCPP ECMS	345kV, 2GW	ABB Korea	2016.01 ~ On going
Wonju Combined Heat & Power Plant	22.9kV, 1.43MW	SK E&C	2015.01 ~ 2015.05
Bukpyeong Thermoelectric Power Plant	345kV, 1.4GW	STX Heavy Industries	2014.11 ~ 2016.06
Hanam Combined Heat & Power Plant	154kV, 465MVA	ABB Korea	2014.10 ~ 2014.11
Godeok Green Power Fuel Cell	22.9kV	SK E&C	2014.05 ~ 2014.09
Gunjang Energy#3	154kV, 145MW	ABB Korea	2013.11 ~ 2013.07
Daegu CES	154kV, 436MVA	Lotte E&C	2013.09 ~ 2013.10
Daejeon Hakha CES	22.9kV, 10.3MVA	Daekwang E&C	2014.11 ~ 2014.12
Yangju Okjeong ESS Project	154kV, 600MVA	Hyosung	2012.11 ~ 2013.11
Samnangjin Pumped Storage Hydroelectric Plant	154kV, 600MW	Vamp Korea	2012.10 ~ 2012.10
Byulnae&Minrak ESS ECMS	154kV, 126MVA	Hyosung	2012.01 ~ 2013.08
Sinjeong Section 3 CES	22.9kV, 18MW	Wookyoung Elec-Tech	2010.12 ~ 2010.12
Pangyo Combined Heat & Power Plant	154kV, 153MVA	Lotte E&C	2010.07 ~ 2010.11
Incheon Posco Power: CCPP 5&6 unit	345kV, 1200MW	Samchang	2010.07 ~ 2010.08
Suwan Energy in Gwang-ju	154kV, 45MVA	Keangnam Enterprises	2009.10 ~ 2010.03
Songdo Combined Heat & Power Plant	154kV, 222MVA	Hyosung	2009.09 ~ 2010.02
Gwangyang Landfill Gas Power Plant	154kV, 85MW	Enginotech	2008.02 ~ 2010.03
Metropolitan landfill Gas Recycling Plant	154kV, 55MW	Eco Energy Holdings	2006.08 ~ 2006.08

ENGINEERING Periodic Test

- ◎ Protection Relay Function Test
- ◎ CT Characteristic Test (Turn Ratio, Knee Point, Secondary Side Injection Test, Polarity and Insulation Resistance)
- ◎ PT Characteristic Test (Turn Ratio, Secondary Side Injection Test, Polarity and Insulation Resistance)
- ◎ Circuit Breaker Operation Test (Close time, Open time, Time Difference Phase to Phase, Insulation Resistance)
- ◎ Transformer Characteristic Test (Vector Group, Turn Ratio, Polarity and Insulation Resistance)
- ◎ Mechanical Protection Devices Interlock Test
- ◎ AC/DC Sequence Test
- ◎ Cable Hipot Test
- ◎ Measuring Grounding Resistance



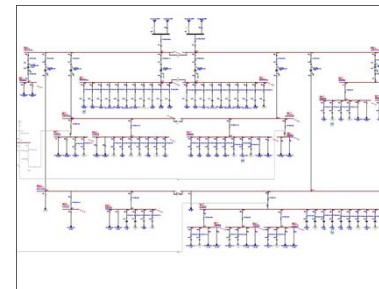
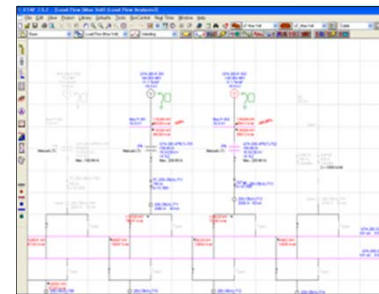
ABOUT EXPERIENCE

Periodic Test

Ansan Combined Heat & Power Plant	154kV	ASUDI	2016.05 ~ 2016.05
Daeryun Combined Heat & Power Plant	154kV, 555MW	Daerun Power	2016.04 ~ 2016.05
Incheon Total Energy Company	154kV, 222MVA	Incheon Total Energy	2016.03 ~ 2016.04
Incheon Airport Energy Prot. Relay	154kV, 127MW	Incheon Airport Energy	2016.02 ~ 2016.11
Metropolitan landfill gas recycling plant	154kV, 55MW	Eco Energy Holdings	2015.03 ~ 2015.04
Byulnae Energy	154kV, 126MVA	Byeollae Energy	2015.04 ~ 2015.05
Incheon Airport Energy MV & LV	154kV, 127MW	Incheon Airport Energy	2015.03 ~ 2015.05
Sewage Treatment Center	22.9kV, 3MW	KDHC	2015.02 ~ 2015.03
Daejeon Hakha CES	22.9kV, 10.3MVA	Choongnam City Gas	2015.01 ~ 2015.02
TPP Combined Heat & Power Plant	22.9kV, 18MW	TPP	2015.06 ~ 2015.07
Yeongheung Wind Power Plant	22.9kV, 16.5MW	Korea South-East Power	2015.05 ~ 2015.06
Gwanggyo heat cogeneration power plant	154kV, 127MW	ABB Korea	2014.09 ~ 2014.10
Saemangeum PJT Prot. Relay	154kV, 320MW	Hyosung	2014.08 ~ 2015.07
Pangyo heat cogeneration power plant	154kV, 153MVA	ABB Korea	2014.06 ~ 2014.06
Incheon Total Energy Company	154kV, 222MVA	Incheon Total Energy	2014.05 ~ 2014.06
Gyeonggi CES Combined Heat & Power Plant	22.9kV, 18MW	Gyeonggi CES	2013.07 ~ 2013.07
KDHC Mapo Branch	22.9kV	KDHC	2013.04 ~ 2013.05
Daesan CCPP	154kV, 465.8MW	CGNPC	2012.11 ~ 2012.12
Cheongsu CES	22.9kV, 31.5MVA	Jungbu City Gas	2011.09 ~ 2011.10
Gwangyang Landfill Gas Power Plant	154kV, 85MW	CEV	2011.10 ~ 2011.10
Gyeonggi CES Combined Heat & Power Plant	22.9kV, 18MW	Gyeonggi CES	2011.04 ~ 2011.05

ENGINEERING System Study

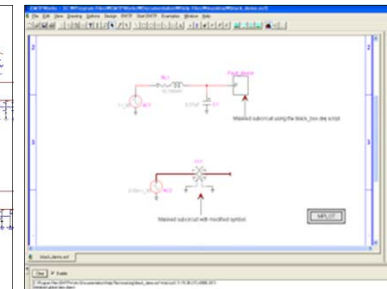
Short-Circuit Analysis
 STAR Device Coordination Analysis
 Arc Flash Analysis
 Load Flow Analysis
 Unbalanced Load Analysis
 Motor Starting Analysis
 Transient Stability Analysis
 Generator Start-Up
 Harmonic Analysis
 Optimal Power Flow
 Reliability Analysis
 DC Short-Circuit Analysis
 DC Load Flow Analysis
 Optimal Capacitor Placement
 Transformer MVA Sizing
 Transformer Tap Optimization
 Battery Sizing and Discharge
 Dynamic Model



Line Cable Input Data

Units or Strands (1000 m per Conductor (Cable) or per Phase (Line))

Line Cable	Library	Size	Length			T (°C)	R	X	Y
			AB (m)	% Tot	#Phase				
13C 240mm2 69kV(1)	13NCTSI	240	80.0	0.0	1	90	0.07500	0.10000	
13C 240mm2 69kV(2)	13NCTSI	240	80.0	0.0	1	90	0.07500	0.10000	
13C 100mm2 33kV	13NCTSI	100	30.0	0.0	1	90	0.08200	0.09000	
13C 400mm2 138kV	13NCTSI	400	150.0	0.0	1	90	0.06000	0.04000	
13C 500mm2 138kV	13NCTSI	500	100.0	0.0	1	90	0.05300	0.03200	
13C 600mm2 700kV	13NCTSI	300	700.0	0.0	2	90	0.08200	0.09000	
13C 70mm2 250kV (1)	65NCTSI	70	250.0	0.0	1	90	0.15500	0.15200	
13C 70mm2 250kV (2)	65NCTSI	70	250.0	0.0	1	90	0.15500	0.15200	
13C 70mm2 250kV (3)	65NCTSI	70	250.0	0.0	1	90	0.20000	0.13100	
13C 70mm2 250kV (4)	65NCTSI	70	250.0	0.0	1	90	0.15500	0.15200	
13C 70mm2 250kV (5)	65NCTSI	70	250.0	0.0	1	90	0.20000	0.13100	
13C 70mm2 250kV A	65NCTSI	70	250.0	0.0	1	90	0.15500	0.15200	
13C 70mm2 250kV B	65NCTSI	70	250.0	0.0	1	90	0.15500	0.15200	



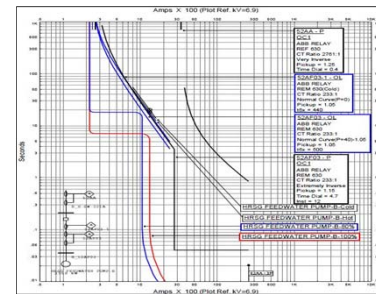
ABOUT EXPERIENCE

POWER SYSTEM STUDY

Chuncheon Power Plant	22.9kV, 3MVA	Dongbu Construction	2016.05 ~ 2016.05
Gunjang Energy#3	154kV, 145MW	eTEC E&C	2016.04 ~ 2017.06
Hamon Korea Relay Coordination	154kV, 1.2GW	Hyosung	2016.02 ~ 2016.03
Yanbu-3 Project in Saudi	380kV, 3.9GW	Hyosung	2016.02 ~ 2016.12
POCR Early Phase Package-1 Project	6kV (MV)	Daeshin Engineering	2015.01 ~ 2015.12
Sululta-Gebreguracha substation in Ethiopia	400kV	Hyosung	2014.08 ~ 2015.02
Shaybah CPF Expansion Project	380kV, 1.4GVA	Samsung Engineering	2014.09 ~ 2014.09
Malaysia Fast Track 3A	500kV, 1GW	Daelim Industrial	2013.12 ~ 2017.09
Wasit Cogen & Steam Gen in Saudi		Samsung Engineering	2013.07 ~ 2013.07
YPFB Ammonia in Bolivia	11kV, 50MW	Samsung Engineering	2013.05 ~ 2014.07
JZR Power System Study	380kV	SK E&C	2013.04 ~ 2013.04
Jazan Refienry Marine Terminal Project in Saudi	380kV	Daeshin Engineering	2013.03 ~ 2016.04
Shaybah NGL Power Generation	380kV, 1.4GVA	Samsung Engineering	2013.01 ~ 2013.08
Termotasajero in Columbia	230kV, 435MVA	Wonwoo Engineering	2013.01 ~ 2015.09
Wasit PJT – PKG#4	380kV	SK E&C	2013.01 ~ 2016.01
Wasit PJT – PKG#3	380kV	SK E&C	2013.01 ~ 2014.03
Rabigh power station in Saudi		SPE	2012.12 ~ 2014.08
Rutenberg 1&2 FGD in Israel		SPE	2012.12 ~ 2013.12
Old Harbour CCPP in Jamaica		Daelim Industrial	2012.11 ~ 2014.08
Novelis Korea Aluminu	154kV	Daelim Industrial	2012.01 ~ 2013.06
Shoaiba Power Plant in Saudi	380kV, 844MVA	Daelim Industrial	2012.01 ~ 2014.12

ENGINEERING Protection Relay Setting Calculation & Review

- T/L Protection
- GIS Protection
- Generator Protection
- BUS Protection
- Step-up Transformer Protection
- Unit-Aux Transformer Protection
- MV Motor Feeder Protection
- Incoming Protection
- Bus-tie Protection
- Load center Protection
- Emergency Diesel Generator Protection



Parameter	Setting	Step	Setting	Unit	Remark
C11SettingW2	Yes	-	-	-	-
C11SettingW3	1: 99999	-	3: 10000	A	-
C11SettingW4	1: 99999	-	3: 10000	A	-
CountOffW3	No	-	Yes	A	Two C11
C11SettingW5	1: 99999	-	3: 10000	A	-
C11SettingW6	1: 99999	-	3: 10000	A	-
LockoutW3	1: 99999	-	3: 10000	A	-
Windowing 1 (W01)	Windowing 1 (W01)	-	Windowing 1 (W01)	-	Hold Used
Windowing 2 (W02)	Windowing 2 (W02)	-	Windowing 2 (W02)	-	-
Windowing 3 (W03)	Windowing 3 (W03)	-	Windowing 3 (W03)	-	-
Windowing 4 (W04)	Windowing 4 (W04)	-	Windowing 4 (W04)	-	-
Windowing 5 (W05)	Windowing 5 (W05)	-	Windowing 5 (W05)	-	-
Windowing 6 (W06)	Windowing 6 (W06)	-	Windowing 6 (W06)	-	-
Windowing 7 (W07)	Windowing 7 (W07)	-	Windowing 7 (W07)	-	-
Windowing 8 (W08)	Windowing 8 (W08)	-	Windowing 8 (W08)	-	-
Windowing 9 (W09)	Windowing 9 (W09)	-	Windowing 9 (W09)	-	-
Windowing 10 (W10)	Windowing 10 (W10)	-	Windowing 10 (W10)	-	-
Windowing 11 (W11)	Windowing 11 (W11)	-	Windowing 11 (W11)	-	-
Windowing 12 (W12)	Windowing 12 (W12)	-	Windowing 12 (W12)	-	-
Windowing 13 (W13)	Windowing 13 (W13)	-	Windowing 13 (W13)	-	-
Windowing 14 (W14)	Windowing 14 (W14)	-	Windowing 14 (W14)	-	-
Windowing 15 (W15)	Windowing 15 (W15)	-	Windowing 15 (W15)	-	-
Windowing 16 (W16)	Windowing 16 (W16)	-	Windowing 16 (W16)	-	-
Windowing 17 (W17)	Windowing 17 (W17)	-	Windowing 17 (W17)	-	-
Windowing 18 (W18)	Windowing 18 (W18)	-	Windowing 18 (W18)	-	-
Windowing 19 (W19)	Windowing 19 (W19)	-	Windowing 19 (W19)	-	-
Windowing 20 (W20)	Windowing 20 (W20)	-	Windowing 20 (W20)	-	-
Windowing 21 (W21)	Windowing 21 (W21)	-	Windowing 21 (W21)	-	-
Windowing 22 (W22)	Windowing 22 (W22)	-	Windowing 22 (W22)	-	-
Windowing 23 (W23)	Windowing 23 (W23)	-	Windowing 23 (W23)	-	-
Windowing 24 (W24)	Windowing 24 (W24)	-	Windowing 24 (W24)	-	-
Windowing 25 (W25)	Windowing 25 (W25)	-	Windowing 25 (W25)	-	-
Windowing 26 (W26)	Windowing 26 (W26)	-	Windowing 26 (W26)	-	-
Windowing 27 (W27)	Windowing 27 (W27)	-	Windowing 27 (W27)	-	-
Windowing 28 (W28)	Windowing 28 (W28)	-	Windowing 28 (W28)	-	-
Windowing 29 (W29)	Windowing 29 (W29)	-	Windowing 29 (W29)	-	-
Windowing 30 (W30)	Windowing 30 (W30)	-	Windowing 30 (W30)	-	-
Windowing 31 (W31)	Windowing 31 (W31)	-	Windowing 31 (W31)	-	-
Windowing 32 (W32)	Windowing 32 (W32)	-	Windowing 32 (W32)	-	-
Windowing 33 (W33)	Windowing 33 (W33)	-	Windowing 33 (W33)	-	-
Windowing 34 (W34)	Windowing 34 (W34)	-	Windowing 34 (W34)	-	-
Windowing 35 (W35)	Windowing 35 (W35)	-	Windowing 35 (W35)	-	-
Windowing 36 (W36)	Windowing 36 (W36)	-	Windowing 36 (W36)	-	-
Windowing 37 (W37)	Windowing 37 (W37)	-	Windowing 37 (W37)	-	-
Windowing 38 (W38)	Windowing 38 (W38)	-	Windowing 38 (W38)	-	-
Windowing 39 (W39)	Windowing 39 (W39)	-	Windowing 39 (W39)	-	-
Windowing 40 (W40)	Windowing 40 (W40)	-	Windowing 40 (W40)	-	-
Windowing 41 (W41)	Windowing 41 (W41)	-	Windowing 41 (W41)	-	-
Windowing 42 (W42)	Windowing 42 (W42)	-	Windowing 42 (W42)	-	-
Windowing 43 (W43)	Windowing 43 (W43)	-	Windowing 43 (W43)	-	-
Windowing 44 (W44)	Windowing 44 (W44)	-	Windowing 44 (W44)	-	-
Windowing 45 (W45)	Windowing 45 (W45)	-	Windowing 45 (W45)	-	-
Windowing 46 (W46)	Windowing 46 (W46)	-	Windowing 46 (W46)	-	-
Windowing 47 (W47)	Windowing 47 (W47)	-	Windowing 47 (W47)	-	-
Windowing 48 (W48)	Windowing 48 (W48)	-	Windowing 48 (W48)	-	-
Windowing 49 (W49)	Windowing 49 (W49)	-	Windowing 49 (W49)	-	-
Windowing 50 (W50)	Windowing 50 (W50)	-	Windowing 50 (W50)	-	-
Windowing 51 (W51)	Windowing 51 (W51)	-	Windowing 51 (W51)	-	-
Windowing 52 (W52)	Windowing 52 (W52)	-	Windowing 52 (W52)	-	-

ABOUT EXPERIENCE

Protection Relay Setting Calculation & Review

Yeongnam LNG Power Plant	154kV, 470MW	Hyosung	2016.05 ~ 2016.11
Myeongji ECMS	22.9kV	Hyosung	2016.04 ~ 2016.04
Malaysia Fast Track 3A	500kV, 1GW	Daelim Industrial	2016.02 ~ 2017.09
Suseo Heat Source Facilities	22.9kV	Kolon Global	2015.11 ~ 2015.12
Seomjingang Hydroelectric Power Plant	154kV, 40MVA	LSIS	2015.09 ~ 2016.06
Incheon Airport Energy	154kV, 127MW	Incheon Airport Energy	2015.08 ~ 2015.11
Hadong Thermoelectric Power Plant	345kV, 4GW	Hyosung	2015.01 ~ 2015.04
KDHC Heat Supply Facilities		KDHC	2015.11 ~ 2015.12
Hanam Combined Heat & Power Plant	154kV, 465MVA	Nasan Electric Industries	2014.04 ~ 2014.08
Angang Incineration Plant	22.9kV, 2.8MW	Hyosung	2014.12 ~ 2015.02
Osan Combined Heat & Power Plant	154kV, 436MW	Hyosung	2014.12 ~ 2015.04
Busan Jung kwan Energy	345kV, 1.8GW	Hyosung	2014.12 ~ 2016.06
Saemangeum Power Plant		eTEC E&C	2014.11 ~ 2014.12
Seo Incheon Thermoelectric Power Plant	154kV, 1800MW	ABB Korea	2014.05 ~ 2014.05
Ansan Combined Heat & Power Plant	154kV, 62.6MW	Kwangmyung Electric	2014.04 ~ 2014.06
Taeon Thermoelectric Power Plant	345kV, 1.05GW	Hyosung	2014.02 ~ 2016.12
Incheon Airport Energy	154kV, 127MW	Incheon Airport Energy	2014.01 ~ 2014.02
Seo Incheon Thermoelectric Power Plant	154kV, 1800MW	ABB Korea	2013.05 ~ 2013.05
Sejong Happy City	154kV, 690MVA	ABB Korea	2013.03 ~ 2013.03
Sejong Happy City Combined Heat & Power Plant	154kV, 530MW	ABB Korea	2013.01 ~ 2013.02
Ye-cheon Pumped Generation Power Plant	345kV, 800MW	Hyosung	2010.06 ~ 2010.08

COMMISSIONING Commissioning for Plant

Commissioning refers to the confirmation of the operational situation on the linked operation between each of the devices and facilities of various auxiliary facilities including electrical, chemical, mechanical, measurement control and fire extinction facilities as well as the overall functions as a plant by operating the relevant facilities for a prescribed period of time following the completion of the installation works at a power generation plant and other plants.

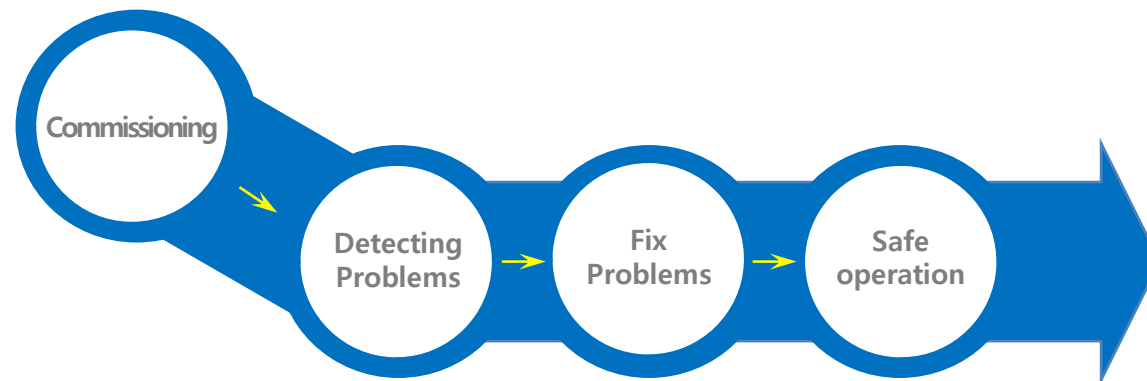
In addition, it is aimed at setting to enable optimal operational conditions by detecting the initial breakdown and inappropriate elements of maintenance of each of the devices in advance, and to allow harmonious maintenance after the commencement of normal operation.



COMMISSIONING Quality management and Necessity of Commissioning

It is possible to secure the safe operation of the power generation plant following the completion of construction of the plant by detecting problems that occur at the state of the commissioning and problems anticipated at the time of operation of the power generation plant in a timely manner, and taking appropriate measures for improvement of such problems. For this purpose, the quality management of a commissioning is particularly important.

That is, it is the process of confirming the soundness, functionality and safety of the buildings, and devices and facilities constructed and installed by executing tests on all the devices and facilities, and a commissioning of the systems and power generation plant prior to the commencement of commercial power generation. This is an essential procedure that must be executed in order for the commercial operation of the power plant.



COMMISSIONING Process

- Pre-Inspection & Study
- Individual Commissioning
- Comprehensive Commissioning
- Final Test
- Operator Training
- Completion
- Commercial Operation

ABOUT EXPERIENCE

Proposal Engineering

UAE FRP Refinery Plant	Fujairah	2014.01 ~ 2014.01
Malaysia Rapid#8 Refinery Plant	Petronas	2013.09 ~ 2014.02
Saudi ASU Refinery Plant	Aramco	2013.10 ~ 2014.02
Kuwait MMA+PMMA Petro Chemical	SAMEC	2013.09 ~ 2013.10
Saudi Rumaitha / Shanayel Facilities	ADCO	2013.07 ~ 2013.09
Kuwait MAH Refinery Plant	KNPC	2013.06 ~ 2013.10
Kuwait CFP Refinery Plant	KNPC	2010.05 ~ 2013.08
Saudi LasTanura CFAP Petro Chemical	Aramco	2013.05 ~ 2013.07
Saudi DAP / NPK Petro Chemical	Ma'aden	2013.02 ~ 2013.05
Kuwait FCC Refinery Plant	KNPC	2013.02 ~ 2013.04
Saudi SWRO Infra Structure	Marafiq	2012.12 ~ 2013.04
Kuwait CFP Petro Chemical	KNPC	2012.07 ~ 2012.10
Saudi POM Petro Chemical	Sabir	2012.07 ~ 2012.10
Qatar Laffan-2 Refinery Plant	Laffan	2012.06 ~ 2012.09
Saudi Jazan Petro Chemical	Aramco	2012.06 ~ 2012.10
Saudi SG&B Power Plant	Samco	2012.05 ~ 2012.08
Saudi PCQ2 Petro Chemical	AMEC	2012.02 ~ 2012.06

ABOUT EXPERIENCE

Detail Engineering Design

Malaysia TGA&T Oil & Gas
Indonesia AGCC Petro Chemical
Malaysia SOGT Oil & Gas
Suwon, Korea A81 I&I
Bolivia Ammonia /Urea Plant
Kuwait TGTU Oil & Gas
Saudi ABEOP Petro Chemical
Korea YG Boiler Power plant
Philippines UTOS Refinery Plant
Kuwait FCC Refinery Plant

Prtronas	2013.10 ~ 2014.09
SENORO	2013.11 ~ 2014.05
GPP	2013.04 ~ 2013.05
Samsung E&M	2013.01 ~ 2013.04
YPFB	2013.05 ~ 2014.07
KOC	2012.08 ~ 2012.10
Sabir	2012.05 ~ 2012.06
Yeosu Cogen	2012.02 ~ 2014.01
Petron	2011.09 ~ 2013.04
KNPC	2013.02 ~ 2013.04

ABOUT EXPERIENCE

Front & End Engineering Design

China LLD Polyelene Petro Chemical	CNNOC	2013.07 ~ 2013.10
China LLD Polyelene Petro Chemical	Damei	2013.02 ~ 2013.04
China LLD Polyelene Petro Chemical	Qinghai	2013.01 ~ 2013.05
Iran PP Petro Chemical	MEPEC	2011.06 ~ 2011.12
Philippines RMP-2 Refinery Plant	Petron	2010.05 ~ 2011.10

Feasibility Study

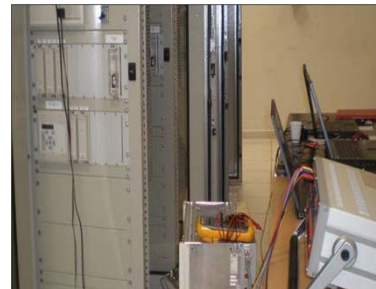
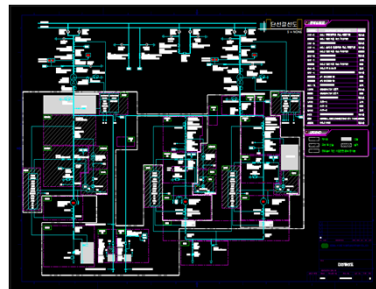
Kuwait CFP Refinery Plant Review	KNPC	2014.01 ~ 2014.01
Kuwait HCFP Petro Chemical	KNPC	2013.02 ~ 2013.04

Others

Russia RKAE Petro Chemical	Kuibyshev-Azot	2012.05 ~ 2013.05
Qatar Laffan DHT Petro Chemical	Laffan	2011.11 ~ 2013.04
Philippines UTOS Refinery Plant	KOSEP	2011.08 ~ 2012.07
Malaysia TBA Petro Chemical	HPC	2011.06 ~ 2012.01
UAE 4 th LPG Train Oil & Gas	Takreea	2011.05 ~ 2012.09

MEASUREMENT & DESIGN Electrical Design & Manufacture

We are able to manufacture protection relay panel. Panels are for generator, transmission line, transformer and others. Especially equipment for extra-high voltage system is one of our strength points. And we proud. Because Our specialists are able to perform all of the process.



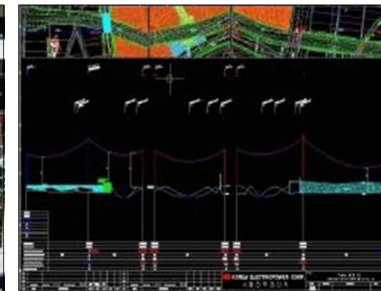
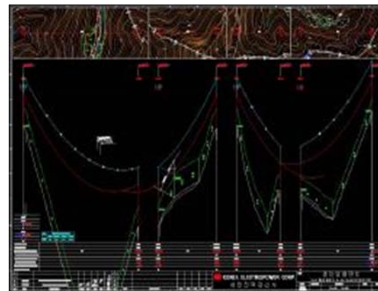
ABOUT EXPERIENCE

Electrical Design & Manufacture

Seomjingang Hydroelectric Power Plant Protection Panel Design	154kV, 40MVA	LSIS	2015.09 ~ 2016.06
Dongdaesan Wind Power Plant Basic Design	22.9kV, 21MW	Byucksan Power	2015.09 ~ 2015.12
Magok CES Electrical Design	22.9kV	Byucksan Engineering	2014.11 ~ 2016.12
Angang Incineration Plant Electrical Engineering Design	22.9kV, 2.8MW	Hyosung	2014.12 ~ 2015.09
Shunt Reactor Reorganization Design		Sejong Engineering	2014.06 ~ 2014.08
Hanam Combined Heat & Power Plant Generator Protection Panel Design	154kV, 465MVA	Nasan Electric Industries	2014.04 ~ 2014.08
Seoul CCPP Generator Protection Panel Design	154kV 388MW	Nasan Electric Industries	2014.08 ~ 2015.11
Pocheon CCPP Generator Protection Panel Design	345kV 2020MVA	Nasan Electric Industries	2012.08 ~ 2014.04
Yangju Combined Heat & Power Plant Generator Protection Panel Design	154kV 600MVA	Nasan Electric Industries	2012.03 ~ 2014.02
Sejong Combined Heat & Power Plant Generator Protection Panel Design	154kV 690MVA	Nasan Electric Industries	2012.03 ~ 2014.02
Ansan CCPP Detail Design	154kV 1023MVA	Posco Engineering	2012.05 ~ 2014.12
Vietnam Landfill LFG Power Plant Electrical Design		Leetek Solution	2007.05 ~ 2007.07

MEASUREMENT & DESIGN Survey & Design for Transmission Line

- ◎ Profile Leveling, Center Line, Plane, Reconnaissance Survey
- ◎ Cadastral Survey
- ◎ Site Survey & Approval
- ◎ Existing Transmission Survey
- ◎ General, Cadastral Triangulation Survey
- ◎ Control Point Survey & Laying
- ◎ Cartography & Aerial Photography
- ◎ Static Survey : Control Point & Topographical Survey
- ◎ Rapid Static Survey : Control Point & Topographical Survey
- ◎ Survey for Civil Engineering Design



ABOUT EXPERIENCE

Survey & Design for Transmission Line

154kV Mado T/L

345kV Gunsan-Saemangeum T/L

154kV Daesan-Dangjin Thermoelectric Power Plant T/L

154kV Yongjeong T/L

154kV Cheongpyeong HP-Uiam HP T/L

154kV Osan-PyeongTaek T/L

154kV Jochiwon-Jeonui T/L

154kV Tongjin-Ganghwa T/L

154kV Shin Deokeun-Susaek T/L

154kV Shin Chungju-North Chungju T/L

345kV Shin Siheung- Shin Seongnam T/L

154kV Soha S/S

154kV Baegun-Yulchon T/L

345kV Gyeongin Ara Waterway

154kV Deokseong T/L

MANUFACTURING Digital Protection System Stimulator Development

All kinds of electrical equipment use the IEC61850 to interwork with Protection Relay, thereby performing supervision, control, measurement, alarm, report and others. In other words, Digital Protection system simulator gathers the information of every IED at all times and saves and analyzes fault data immediately. Therefore, this system improves reliability and reduces damage because it prevents accident in advance and restores operation promptly.

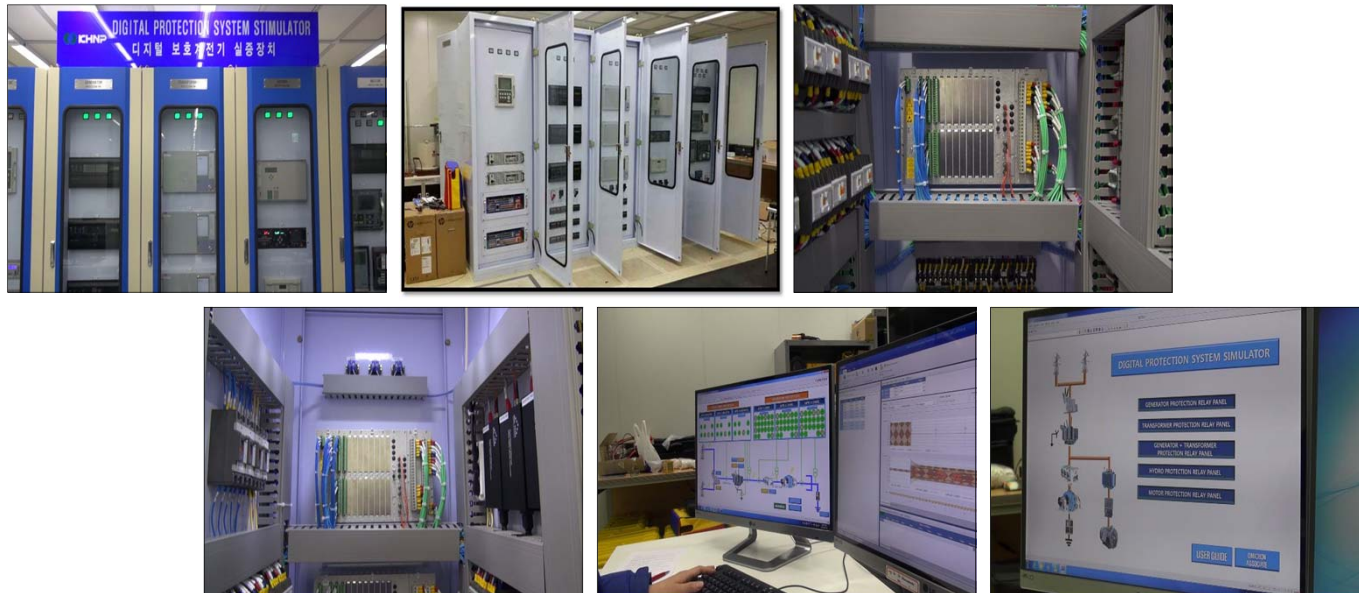


ABB KOREA AGENCY

We are a special agent of ABB.
 ABB is world's 3 major engineering company.
 We provide best protection relay in close cooperation
 and perform quality control by function test



**Combined Heat and
Power Plants**



Nuclear Power Plant



Plants

EQUIPMENT

DOBLE – F6150

ISA – DRTS66

OMICRON – CMC356



EQUIPMENT

AEMC – 4500

Vacuum Circuit Breaker Analyzer

DADA – DAHP6020

OMICRON – CM GPS

HIOKI – 3280-10

YOKOKAWA – CA150



EQUIPMENT

ISA – CBA1000

OMICRON – CPC100

VANGUARD – CT6500

FLUKE - 434

FLIR – P65CSI (Thermo-Graphic Camera)

HIOKI – L.C.R HITESTER 3522-50



EQUIPMENT

Function Generator – G305

Pneumatic Test set

High Voltage Insulation Tester 2000V 5000MΩ

Phase Sequence Indicator 50~450V

Precision Multi-ohmmeter

Motor & Phase Rotation Tester 3126-01



EQUIPMENT

- Power Analyzer – PROTEK 3003Q
- Function Generator – PROTEK 9205C
- Frequency Counter 45~60HZ 0.2HELZ STEP
- Psychrometer Synchro scope
- Dewpoint Meter - 645
- Hand Pump – PGMO 20bar



EQUIPMENT

Illuminometer – 0~300/1000/3000LUX

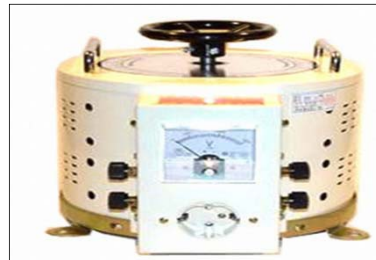
Digital Electro Pneumatic Calibration

Vibration Measurement Equipment 0.01~2.0m/m

High Speed recorder

Variac Slidacs 3KVA

Thermometer – JT650C



EQUIPMENT

- Oil Acid Tester
- Oil Insulation Tester
- Clamp Earth Tester
- KORITSU – 3125
- Digital Insulation Tester – MY4001



EQUIPMENT

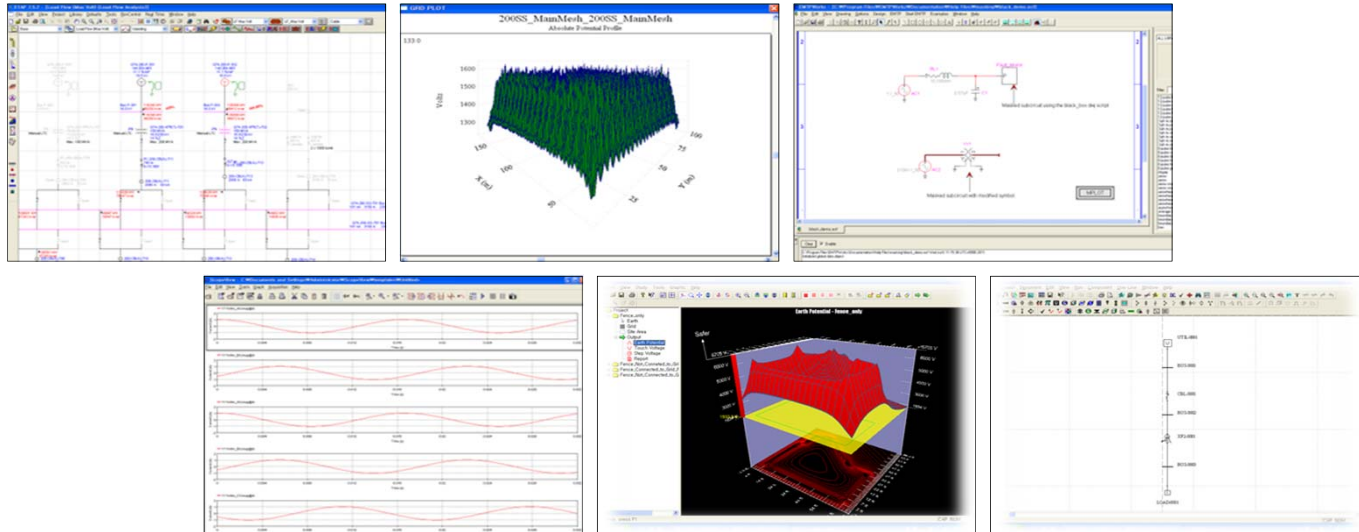
ETAP – OTI, CEATI

PTW – SKM

GROUND MAT – SKM

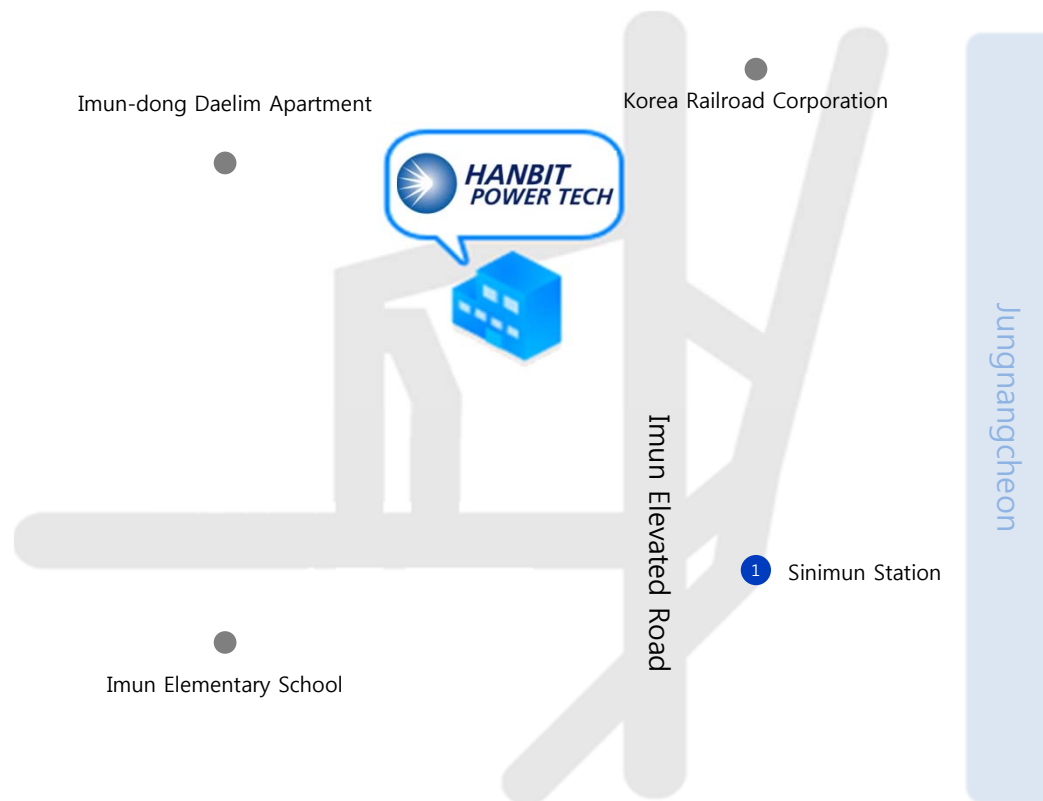
EMTP-RV (Transient study : TRV)

ATP Draw (Transient study : Lighting, Switching)



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