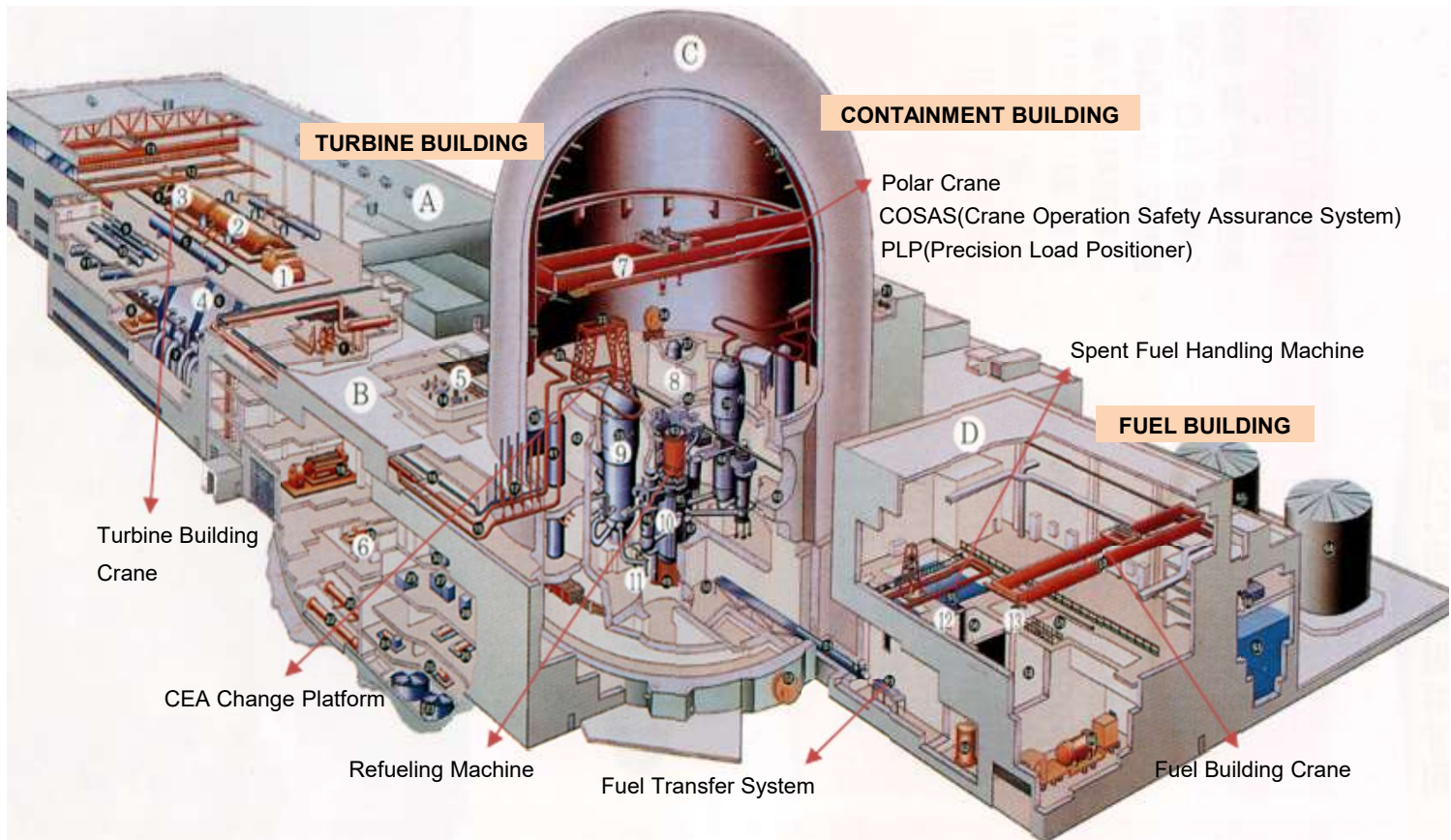


for the People to the World



The Solution Provider for NPP Operation

- Fuel Handling Equipment
- Polar, Cask and Turbine Cranes
- Spent Fuel Storage & Rad-Waste Disposal



Greetings

Dear our precious customer and engineering partners

With the sprit of “for the People, to the World” , POWER MnC was established by 33 professional engineers at Daeduck Science Complex of South Korea in 1997, among the raid of Asian Financial Crisis.

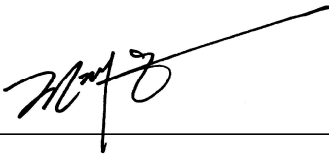
Through **Professional Organized World-best Engineering Resources** of the invincibly superior technologies in field of **Measuring** [Condition Monitoring] and **Control** technologies, we want to be the faithful Safeguard for the Industries of Steel and Nuclear Power Plant,

Our customer has been the world-leading Steelmakers and NPP Operators, whose timely feedback and ceaseless advices have encouraged us to come up to now.

Our staffs are ready for your calling at anytime to anywhere.

Thank you.

JEON, Jae-Young, Ph.D.
President/CEO




Company History

1997 Established

1998 Established POWER R&D Center

2000 Acquired ISO 9001 certificate

2001 Commercial Supply of Caster Strand Monitoring System “Roll Checker” to POSCO/Korea

Developed Precision Load Positioner “PLP” for NPP

2002 Developed Crane Operation Safety Assurance System “COSAS” Complying with NUREG-0554 “Single Failure Proof Crane of NPP”

2002 Commercial Supply of Online Roll Gap Checker “ORGC” to POSCO, and NSC/Japan

2009 Established Beijing Office, POWER (Beijing) MnC Co., Ltd.

Order Awarded, Fuel Handling Equipment “FHE” for SKN #3&4 (Shin-Kori #3&4 Nuclear Power Plant, South Korea)

2009 Roll Checker was registered as the World Best World First “WBWF” by POSCO

2011 Constructed, Full Scale Test Building for FHE

2013 FHE Supplied to SKN #3&4 NPP (Shin-Kori #3&4 Nuclear Power Plant, South Korea)

2015 FHE Supplied to SHN#1&2 NPP (Shin-Hanul #1&2 Nuclear Power Plant, South Korea)

2017 FHE Supplied to BNPP#1,2,3&4 NPP (Barakah #1-4 Nuclear Power Plant, UAE)

2019 FHE Supplied to SKN#5&6 NPP (Shin-Kori #5&6 Nuclear Power Plant, South Korea)

2019 Order Awarded to supply Movable Crane Shelter for Radioactive Waste Surface Disposal Site to KORAD/South Korea

Supplied FHS Mock-up(RV, RM, FTS, FTT, Fuel Rack, STT) to KEPCO KPS Training Center

Certified Manufacturer by ASME Code “U”(Pressure vessel), “S”(Power boiler), “PP”(Pressure piping)

2020 PLB(Precision Lifting Beam) developed and certified as NET “NEW Excellent Technology”

Established, Tokyo Office, Power Japan Co., Ltd.

Certified as KEPIC-MN Manufacturer (Korea Electric Power Industries Code-Machine Nuclear)

2021 Certified as NPP Crane Supplier [M246, M248, M249 & M250] by KEPCO and KHNP

2022 LTMSC Refueling Developed Tools and SG Mockup Supplied to Barakah Nuclear Power Plant, UAE

Certified as NPP Crane Supplier [UM229A, UM246, UM248, UM250, UN205] by KEPCO E&C

2023 Acquired ISO 3834-2 certificate



QA system and PQ status for Nuclear Business

International Quality System

- ISO9001 for all products
- ISO14001(Environment), ISO45001(Safety and Healthcare)
- ISO3834-2(Welding) Quality requirements for fusion welding of metallic materials
- ASME "U,S,PP"(Sect VIII, BPVC)
- KEPIC "MN"

Nuclear Supplier Certification

- KINS TR about COSAS Complying with NUREG-0554
(Single Failure Proof Crane)
- Nuclear Quality System(A-Class) for FHS and PLP/COSAS
- Certified Supplier/Manufacturer/Maintenance for Auxiliary Equipment
 - Crane for Turbine Building and Fuel Building [M246, A-Class]
 - Polar Crane 950 Ton [M248, A-Class]
 - Misc. Crane 15-150 Ton [M249, A-Class]
 - Misc. Crane and Hoist up to 15Ton, [M250, S-Class]
- Certified Spare Part Supplier: (Q-Class) FHS, (A-Class) Crane, Load Positioner

Certificate of Registration by KHNP

Quality Class	Item Code	Item Description	Expiration Date	Certificate No.
Q-Class	413	FUELING & REFUELING EQUIPMENT	2022.04.06 ~2027.04.21	202200235
	ME-AX2	Equipment of Gen/Turbine	2022.06.07 ~2027.06.06	202200246
	ME-FH1	Fuel and Refueling of CANDU	2022.06.07 ~2027.06.06	202200246
A-Class	127	CRANES	2021.03.15 ~2026.03.14	202001129-1
	127-1	LOAD POSITIONER	2019.07.22 ~2023.07.21	201901469
	ME-NT1	Part of Fuel Handling System	2021.06.28 ~2026.07.13	202100946
	ME-SG1	Strain Gage / Load Cell	2021.06.28 ~2026.07.13	202100946
	ME-CR2	All kinds of Crane	2021.06.28 ~2026.07.13	202100946
	EL-AX1	Aux.Equip. and Test Equip.	2022.05.26 ~2027.05.25	202200246
	ME-AX1	Aux.Equip. and Equipment	2022.05.26 ~2027.05.25	202200246
	M250	Misc.Crane & Hoist Less than 15Ton	2020.12.29 ~2026.01.30	202001247
	MCR01	Overhead Crane & Misc.Crane 15~180Ton	2020.08.14 ~2025.08.13	202000843
	M248	Containment Polar Crane	2021.03.15 ~2026.03.14	202001129
	M246	Turbine Building Overhead Crane	2021.03.15 ~2026.03.14	202001129
	S-Class M249	Overhead Crane & Misc. Crane 15~150Ton(Nuclear)	2020.12.29 ~2026.01.30	202001247

Certificate of Registration by KEPCO

Quality Class	Item Code	Item Description	Expiration Date	Certificate No.
T-Class	M246	TURBINE GENERATOR BUILDING MAIN CRANE AND FUEL HANDLING AREA CRANE	2021.02.24 ~2024.02.23	202100003
	M248	REACTOR CONTAINMENT BUILDING POLAR CRANE	2021.02.24 ~2024.02.23	202100003
	M250	HOISTS AND MISC. CRANES (LESS THAN 15 TON)	2021.02.24 ~2024.02.23	202100003
S-Class	M249	OVERHEAD CRANE & MISC. CRANES (15 TO 150 TON)	2021.02.24 ~2024.02.23	202100003
	M249S	SEAWATER BYPASS INTAKE STRUCTURE GANTRY CRANE	2021.02.24 ~2024.02.23	202100003

Certificate of Registration by KEPCO E&C

Quality Class	Item Code	Item Description	Expiration Date
A-CLASS S-CLASS	UM229A / SG00914	NON-SAFETY-RELATED HEAT EXCHANGERS (PLATE TYPE/SHEE&TUBE TYPE)	2022.07.15 ~2025.07.14
	UM246 / SG00940	TURBINE AREA MAIN CRANE & FUEL HANDLING AREA CRANE, MISCELLANEOUS CRANES (15 TO 150 TON)	2022.11.15 ~2025.11.14
	UM250 / SG00931	HOISTS & MISCELLANEOUS CRANES (LESS THAN 15 TONS)	2022.11.15 ~2025.11.14
A-CLASS	UM248 / SG00930	REACTOR CONTAINMENT BUILDING POLAR CRANE	2022.11.15 ~2025.11.14
Q-CLASS	UN205 / SG00947	SHOP FABRICATED PRESSURE VESSELS & TANKS	2022.11.15 ~2025.11.14

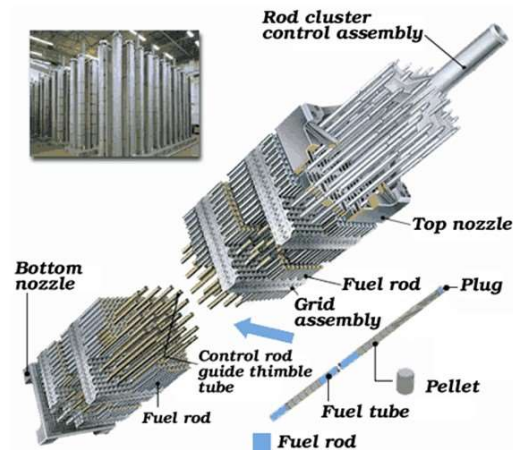
Equipment Supply & Maintenance for Fuel Handling System

As the manufacturer/supplier of the Fuel Handling System, POWER MnC constitutes a key link part of the supply chain of APR1400, the 3rd generation Advanced Korean type NPP with revolutionary enhanced safety.

Fuel Handling System consist of

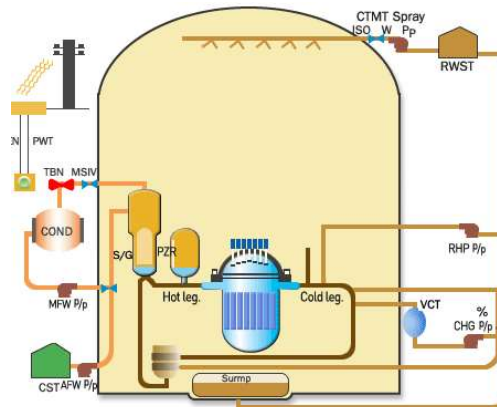
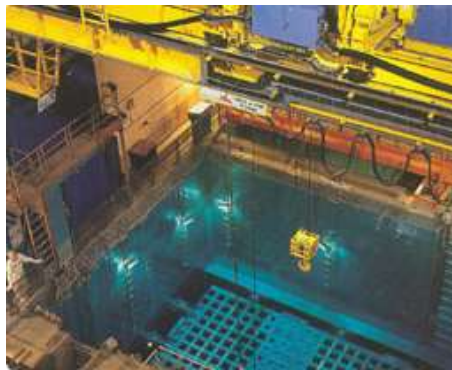
- Refueling Machine(RM): loading and off-loading fuels from the RV
- Fuel Transfer System(FTS): transports fuels between the refueling pool and the spent fuel pool
- New Fuel Elevator(NFE): lowers new fuels from the floor level of the fuel building into the spent fuel pool
- Spent Fuel Handling Machine(SFHM): moves the fuels within the fuel building between FTS and NFE

Up to now, POWER MnC have manufactured/supplied FHSs over 10 Units of APR1400 type NPP, including SKN#34, SKN#56, SHN#12 in South Korea, and NPP #1-4 at Baraka, UAE.



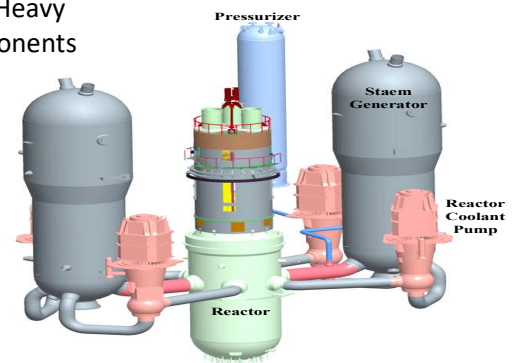
Nuclear Fuel

Spent Fuel Pool



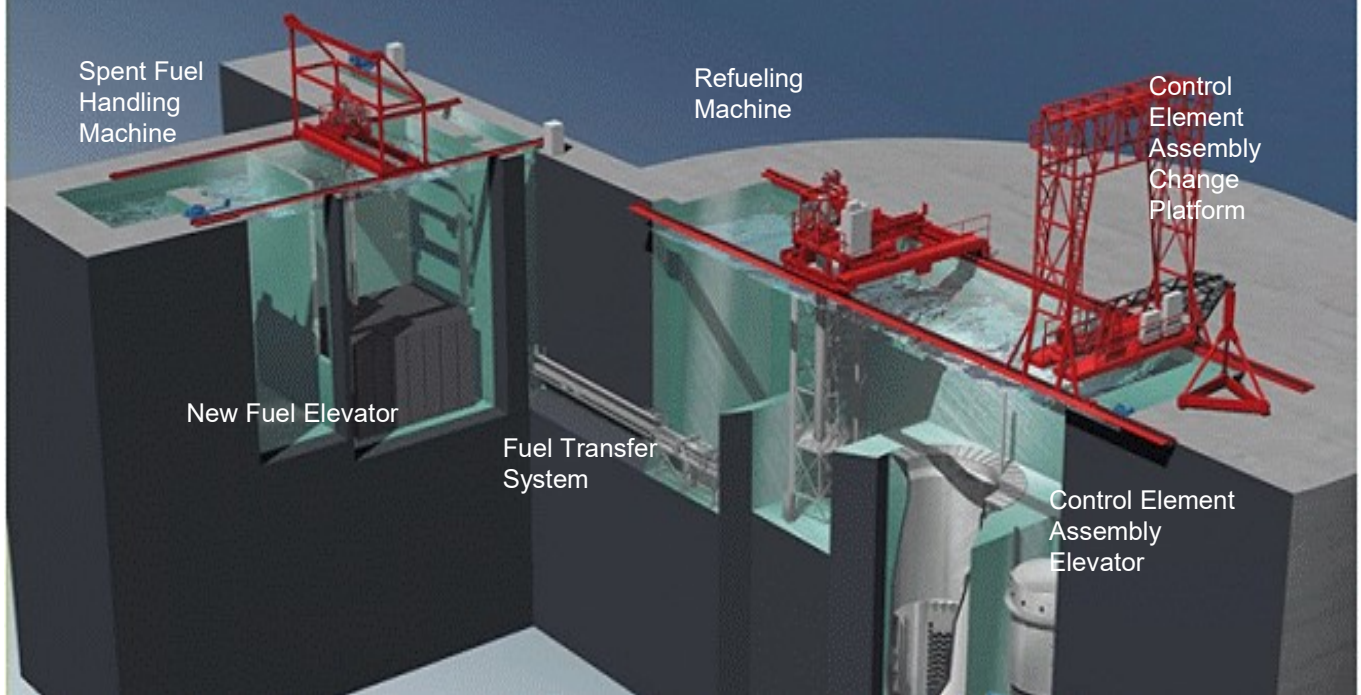
NPP
Conceptual
Drawing

NSSS Heavy
Components



Fuel Building

Reactor Containment Building



Manufactured Equipments and Handling Tools of Fuel Handling Systems

Refueling Machine(RM)

- Extract/load nuclear fuel from/into the reactor vessel



Spent Fuel Handling Machine(SFHM)

- Handles nuclear fuel in the nuclear fuel building



New Fuel Elevator(NFE)

- Moves new fuel up/down using winch



Fuel Transfer System(FTS)

- Conveys new fuel and spent fuel between the fuel building and containment building



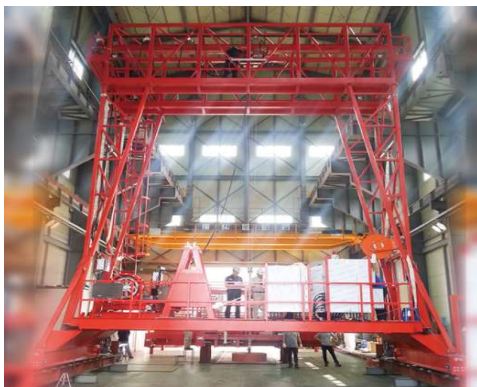
Fuel Transfer Tube(FTT) & Blind Flange

- FTT is a tube to convey fuel assembly between containment building and fuel building wall



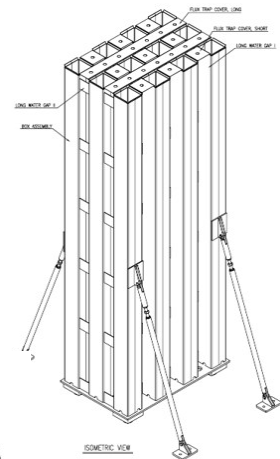
CEA Change Platform(CEA-CP)

- CEA replacement and ICI tool support



Fuel Storage Rack(FSR)

- A container designed to store nuclear fuel assembly



Lifting Device

- Core Support Barrel(CSB), Lower Support Structure(LSS), Core Shroud Assembly (CSA) under Lifting Device



FHE and NSSS Mock-up for Operation/Maintenance Training

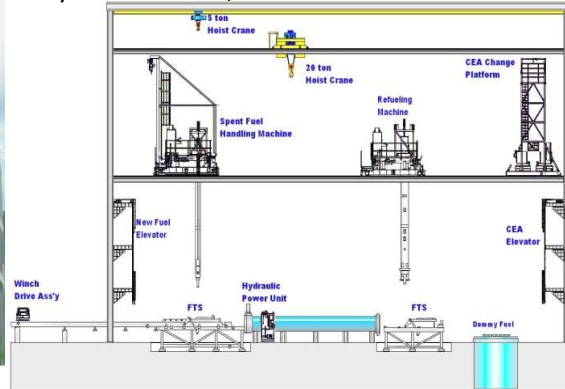
All equipment of Fuel Handling System need to be totally integrated and tested under the same operation condition as the actual NPP before delivery, which can eliminate any kind of quality risk probably leading to time loss during install commissioning at site.

POWER MnC had the Self-Constructed, Prototype FHS Test Shop equipped with FHEs of RM, SFHM, FTS, NFE, and the Partial Mock-up of Reactor Vessel with Fuel Cell filled with Dummy Fuels.

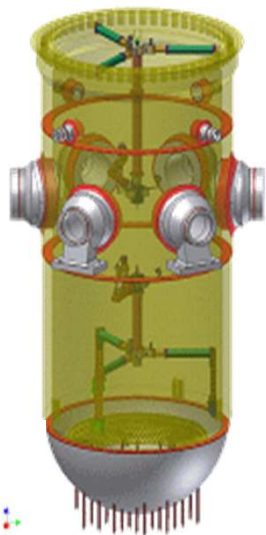
KPS(KEPCO Power Service) Training Center for FHS Operation/Maintenance equipped with RM, FTS, FTT, FSR, Single Stud Tensioner and RV Mock-up was constructed by POWER MnC, too.



FHE Test Shop at POWER MnC



Full Scale FHE Test Shop with RV Mock-up



Reactor Vessel Mock-up

Nuclear Fuel



Refueling operation & maintenance training by using the Prototype Mock-up Facilities



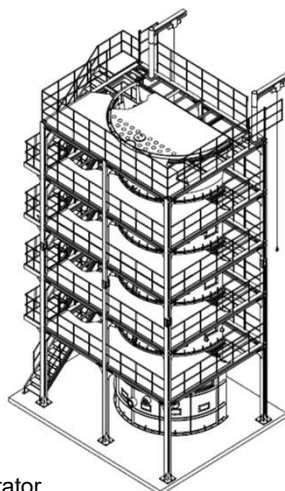
RM Mast Handling the Dummy Fuel in the Fuel Cell of RV Mock-up inside



Refueling Machine



Partial Mock-up of Steam Generator



Refueling Machine



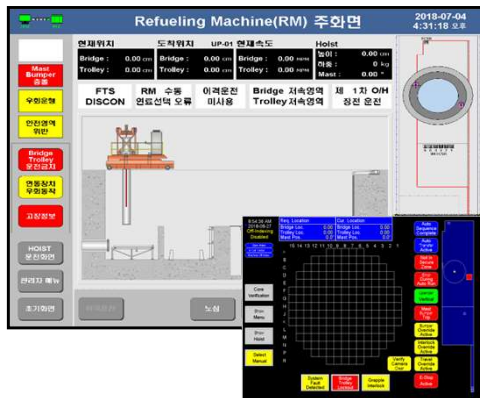
General Layout of Operation/Maintenance Training Facility of KPS(KEPCO Power Service) equipped with FHE and NSSS Mock-up, supplied by POWER MnC

Upgrade/Maintenance for Fuel Handling Equipment

Overhaul/Upgrade of FHS is carried out to enhance stability and work efficiency by replacing the mechanical and electrical components of outdated nuclear fuel handling systems with new ones which guarantee the improved performance. Driving parts of FHS Equipment are to be replaced in order to increase the refueling speed in the operating nuclear power plants.

POWER MnC have performed the OH/upgrade project for Hanbit (HBN) #56 and Hanul(HUN) #56, NPP in South Korea including replacement of the Obsolete component, HMI Console and PLC upgrade with Control Panel, and replacement of the Total Driving System for higher fuel exchange rate, from 3 to 6 FA(Fuel Assembly) per hour.

Strengthening of the Fuel Handling Capability



PLC should be updated regularly



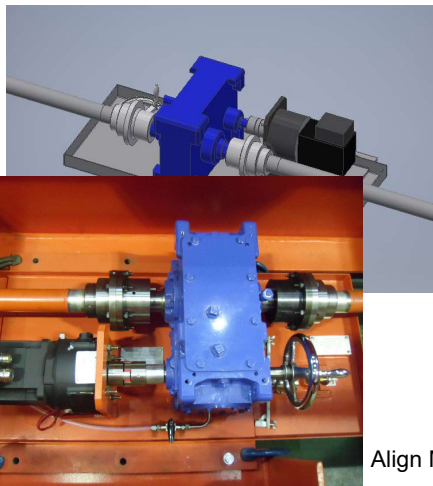
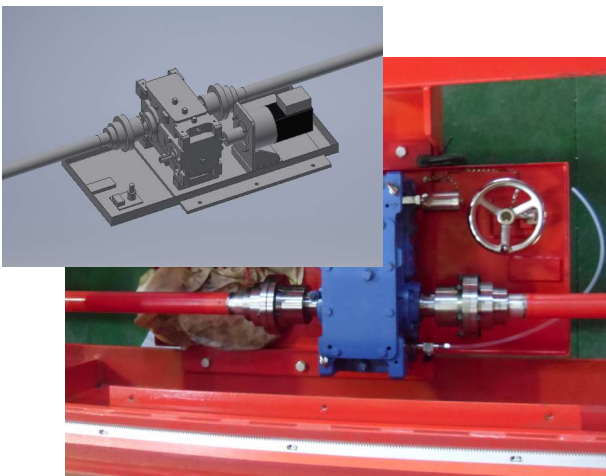
HMI updated and V&V carried out

HMI main display of Refueling Machine

RM Control Console for renewal

Driving parts are to be replaced for Strengthening and Overhaul Updating

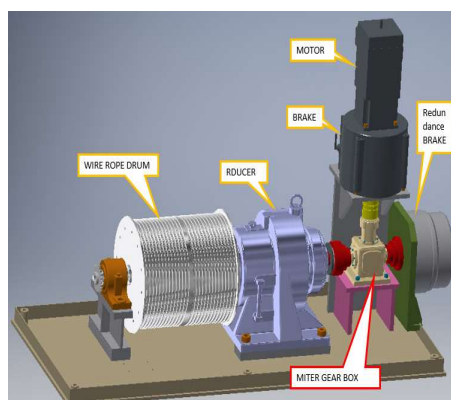
Motor & Reducer jointed to Driving Shaft for renewal



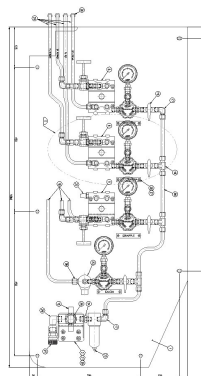
FTS Control Panel



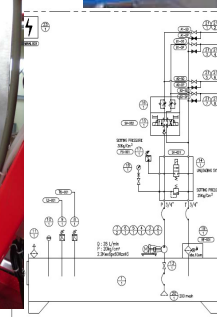
Align Main Hoist Motor



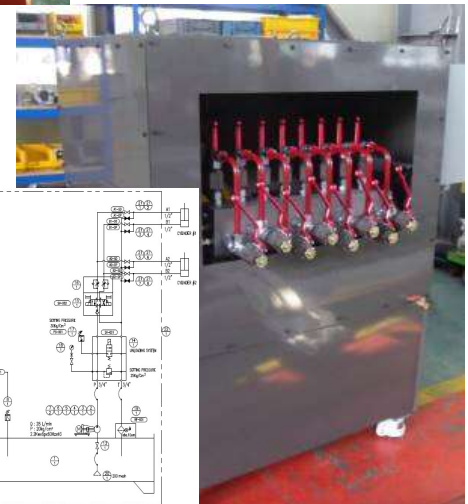
RM Hoisting Device to be upgraded for Single Failure Proof



Pneumatic System for Fuel Gripper operation of RM



Hydro Power Unit(HPU) for FTS Operation



Polar Crane and Turbine Crane for NPP, with Handling Devices

POWER MnC supplies all types and sizes of NPP cranes, especially being good at the Outage-critical cranes for NPP operation, e.g. Polar Crane in Containment Building, Turbine Building Crane, and Cask Crane in Fuel Building.

Polar Crane (operating on circular rails inside containment building, handling reactor heads and RV internal) is to be equipped with COSAS(Crane Operation Safety Assurance System) to comply with Single Failure Proof (NUREG-0554, 0612) requirement.

Precision Load Positioner(PLP) connected to the Main Hook of Polar Crane handles a heavy load up/down, with 0.01mm precision.

Turbine Crane equipped with Precision Lifting Beam(PLB) can convey and unload Turbine Rotor with 0.01mm precision, too.

Spent Fuel Cask Handling Crane in Fuel Building also need to be Single-Failure-Proofed, by regulation NUREG-0554.

Single Failure Proofed Polar Crane by COSAS [Crane Operation Safety Assurance System]

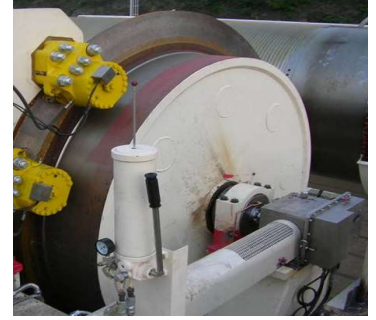
- Supplied to Shin-Kori(SKN) #3&4, Shin-Hanul(SHN) #1&2 together with Polar Crane



Polar Crane on the Rail



Emergency Brake and Failure Brake of COSAS installed at Hoisting Device of Polar Crane



PLP [Precision Load Positioner]

- Supplied to Shin-Kori(SKN) #3&4, Shin-Hanul(SHN) #1&2, Shin-Wolsong(SWN) #1&2 together with Polar Crane



← RV Internal hanged by Polar Crane with PLP

PLP on the Storage Stand, ready for delivery to NPP →



PLB [Precision Lifting Beam]

- Supplied to Wolsong(WSN) #1&2



← Turbine Building under LP Rotor maintenance

Turbine Crane with PLB (Precision Lifting Beam) installing LP Rotor handling →



Upgrade/Overhaul Maintenance for NPP Cranes

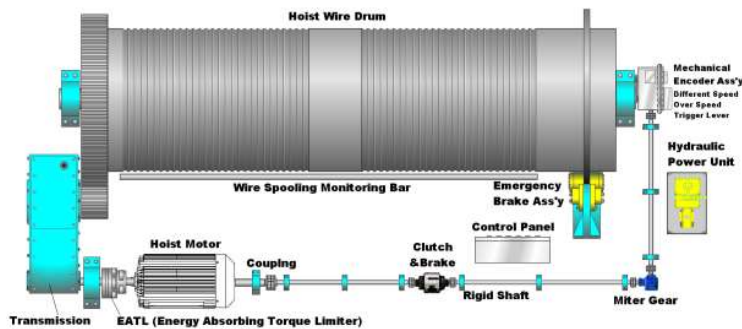
Polar Crane Meandering occurs when round-type rail and wheel are not properly aligned, which should be corrected through proper alignment and rail correction. Roundness data on polar crane rail be analyzed using 3D measuring system, and wheel conditions to be checked by vision system and digital gauge.

For Turbine Building Crane maintenance and repair, Overhaul and trouble fixing of Single Failure Proof system, main hoist brake and motor brake replaced for Shin-Kori(SKN) units 3&4 NPP.

Gantry crane anti-collision device was installed for Shin-Kori(SKN) units 1&2 NPP.

Overhaul Upgrade Equipped with Single Failure Proof

COSAS Lay-out



Single-Failure-Proofed Polar Crane Hoister by COSAS Application



RM Hoisting Mechanism
Upgraded for Single Failure
Proof Performance

Polar Crane Maintenance and Performance Improvement

- Polar Crane Meandering: Design Review, Site Check, Remedy Action



Install Rigging Frame

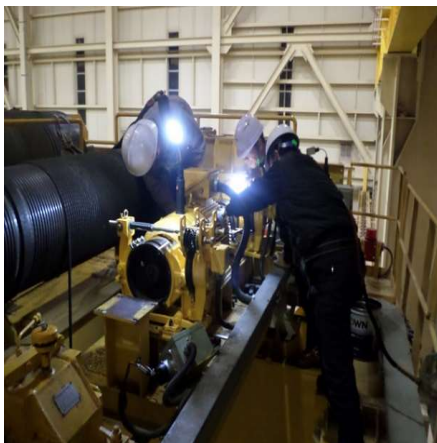


Install Main Hoist Brake



Align Main Hoist Motor

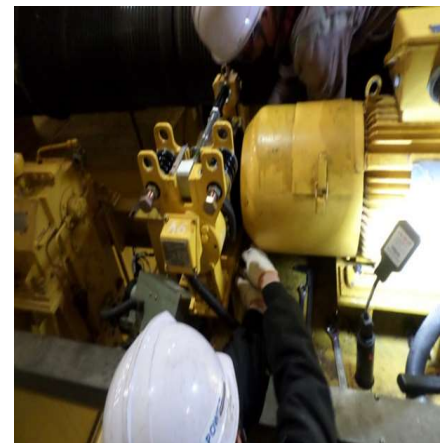
Turbine Building Crane Maintenance and Upgrade



Align Aux. Hoist shaft



Replace Running Motor Brake



Hoist Brake Gap Adjustment

Supply of Cranes for Radwaste Disposal Facility

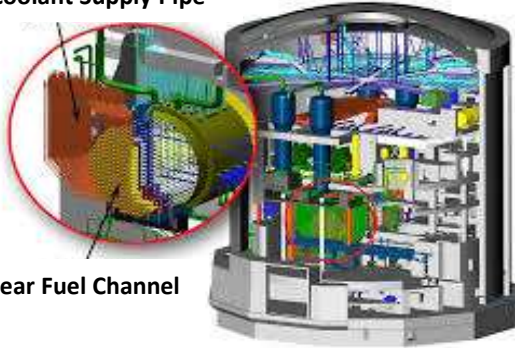
Macstor Crane with COSAS (Single Failure proof) for CANDU Type NPP, KHNP

Macstor crane is a gantry type crane in order to dry store CANDU fuels in the Macstor/KN-400 storage facility at Wolsong(WSN) NPP site

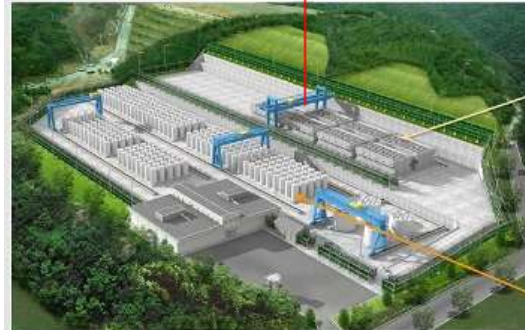
Coolant Supply Pipe

Nuclear Fuel Channel

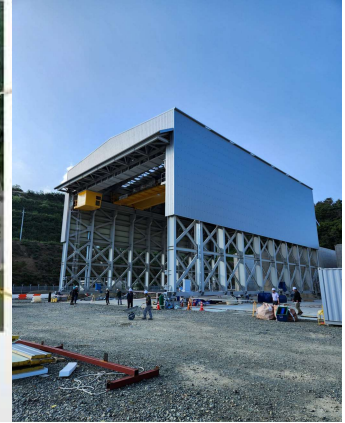
CANDU Type Calandria and Fuel



Macstor Crane



Spent Fuel Dry Storage in CANDU type NPP

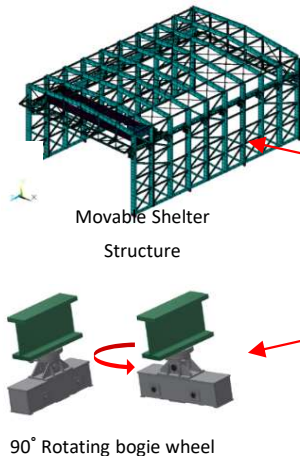


Movable Crane Shelter (MCS) for Near-Surface Disposal Facility

MCS handles Low and Intermediate Level Waste Drum in the Near-Surface Disposal Facility (under construction for KORAD)



Near-Surface Disposal Facility



Movable Crane Shelter (MCS)



Handling of drum

Silo Crane for LILW Underground Disposal Facility of KORAD

Silo crane is a round-type crane in order to handle Low and Intermediate Level Waste Drum for Underground Facility (in operation)



Underground Silo Disposal Facility

Silo Crane



Handling of LILW

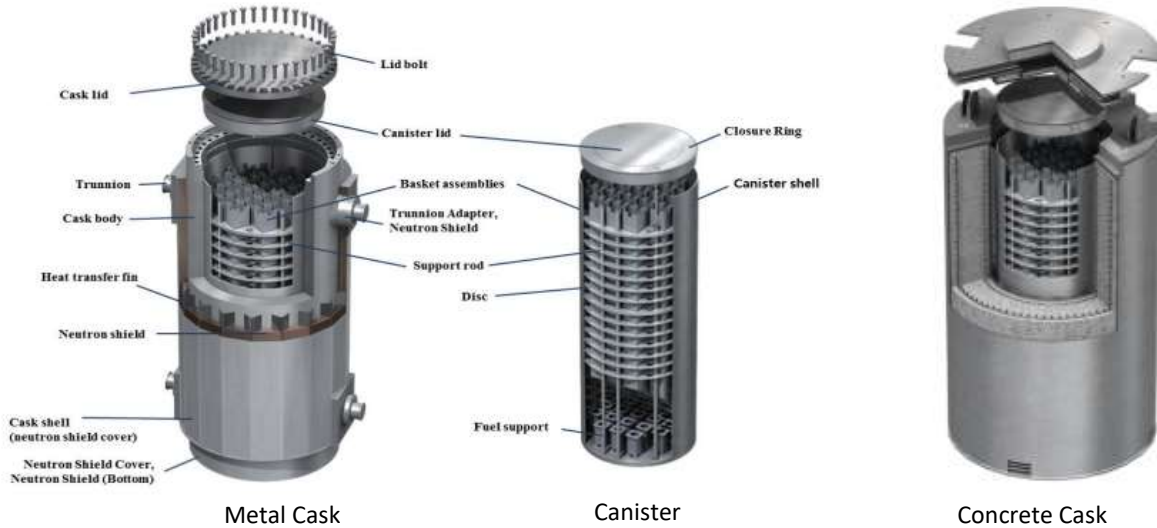


Handling of LILW

Casks, Spent Fuel Storage Racks, D&D Equipment

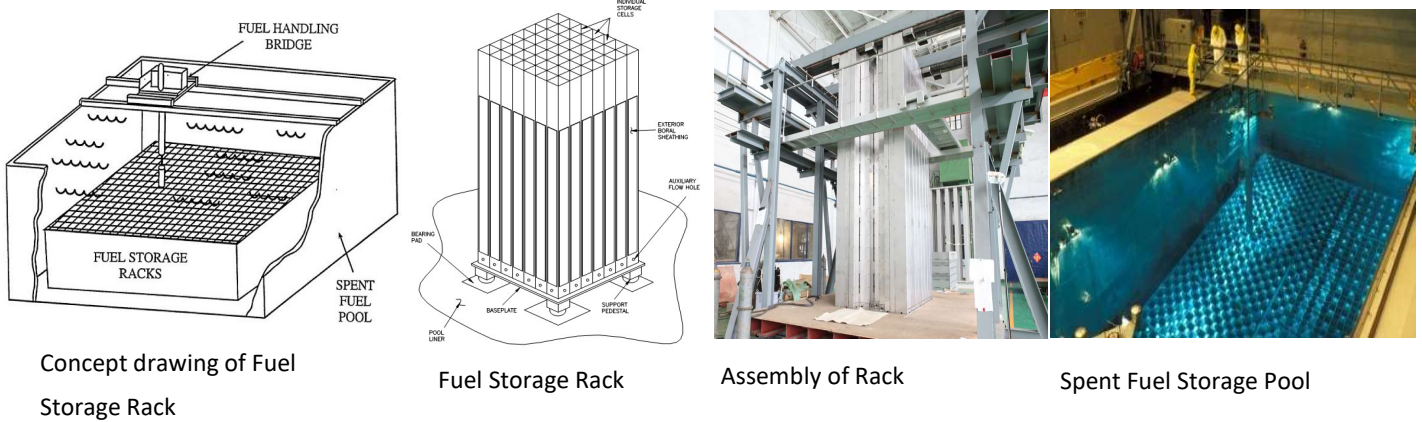
Casks for Dry Storage of Spent Fuels

Casks are containment vessels which store spent nuclear fuels inside, providing radiation shield toward outside. During the designated storage period, required is to meet the design criteria for storing safely against radiation, thermal, structural. Six patent for metal cask and 5 patent for Concrete cask including technical report and paper are developed through the CASK Model KN-24 development program, which are provided by KORAD.



Fuel Storage Racks for Wet Storage of Spent Fuels

Fuel Storage Racks are welded structure of stainless steel plate including poison material in order to store spent nuclear fuels in the storage pool safely for long time.



Decontamination & Decommissioning Equipment for Low and Intermediate Level Radwaste Disposal

Evaporator for Liquid Radioactive Waste Treatment, Drum Filling and Handling for Solid Radwaste Waste Treatment





Headquarter

ADDRESS:

8, Cheoyongsaneop 5-gil,
Cheongnyang-eup,
Ulju-gun, ULSAN, Republic of KOREA.

TEL : 82-52-955-5920

FAX : 82-52-955-5930

Email : pw@powermnc.com

WEB : www.powermnc.com

CONTACT US

KOREA (ULSAN) : HEAD QUARTER

Contact: Mr. J.Y. JEON Ph.D.

Email : pw@powermnc.com

Mobile : +82-10-9270-5920

JAPAN (TOKYO)

Contact: Mr. Tadashi YOSHIKAWA

Email : t.yoshi@powermnc.com

Mobile : +81-80-6894-2760

CHINA (BEIJING/WUHAN)

Contact: Mr. WEI YONG

Email : wei.yong@powermnc.com
/ wyacm@163.com

Mobile : +86-138-7121-3530

CANADA (TORONTO)

Contact: Ms. Grace Jeon Ph.D.

Email : grace@powermnc.com

Mobile: +1-289-314-5119