

2024

Sieyuan 思源电气

E-house

for power supply solutions



Smarter power, Better life

Shanghai, China

SIEYUAN ELECTRIC CO., LTD.

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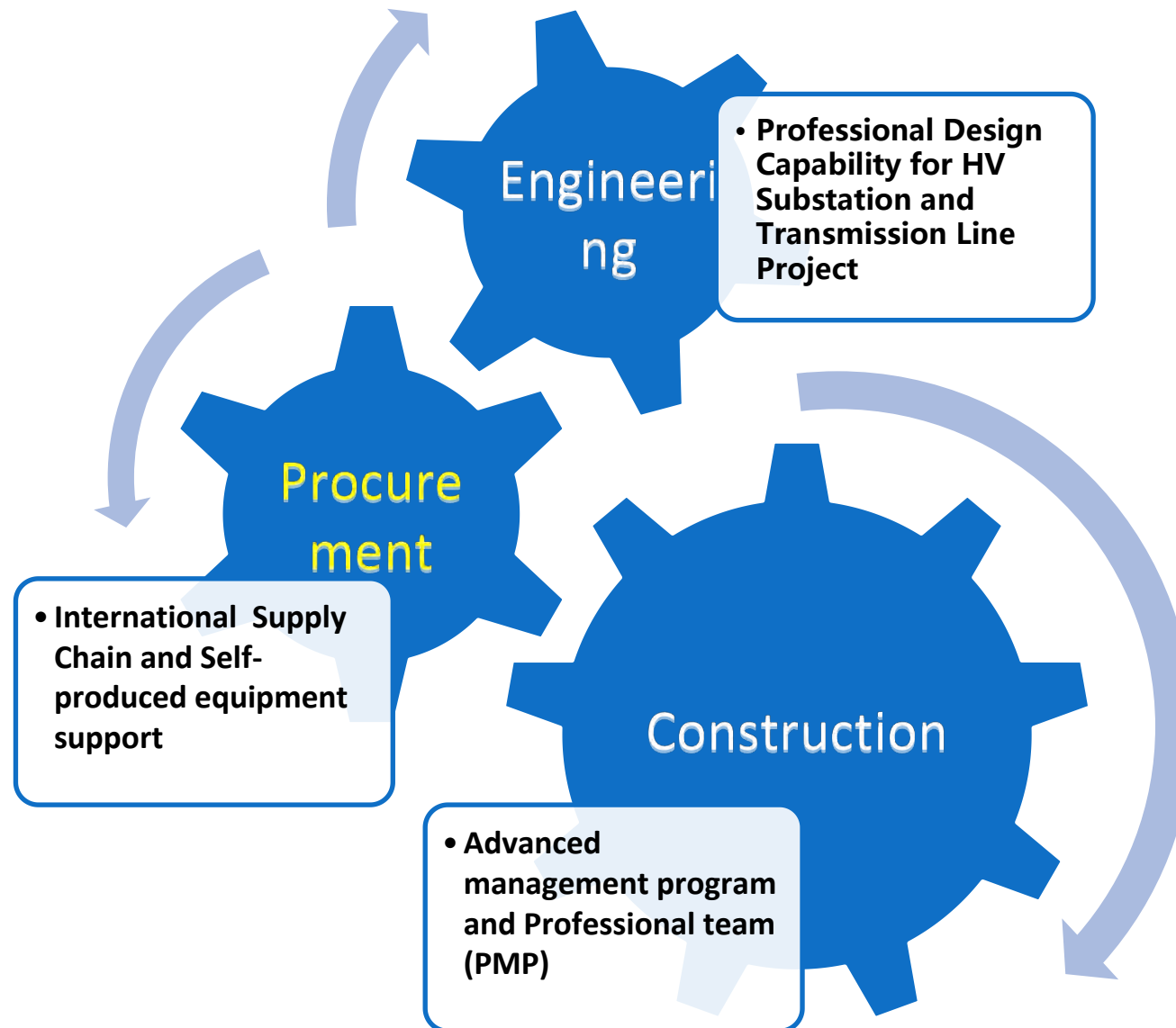
04

Applications





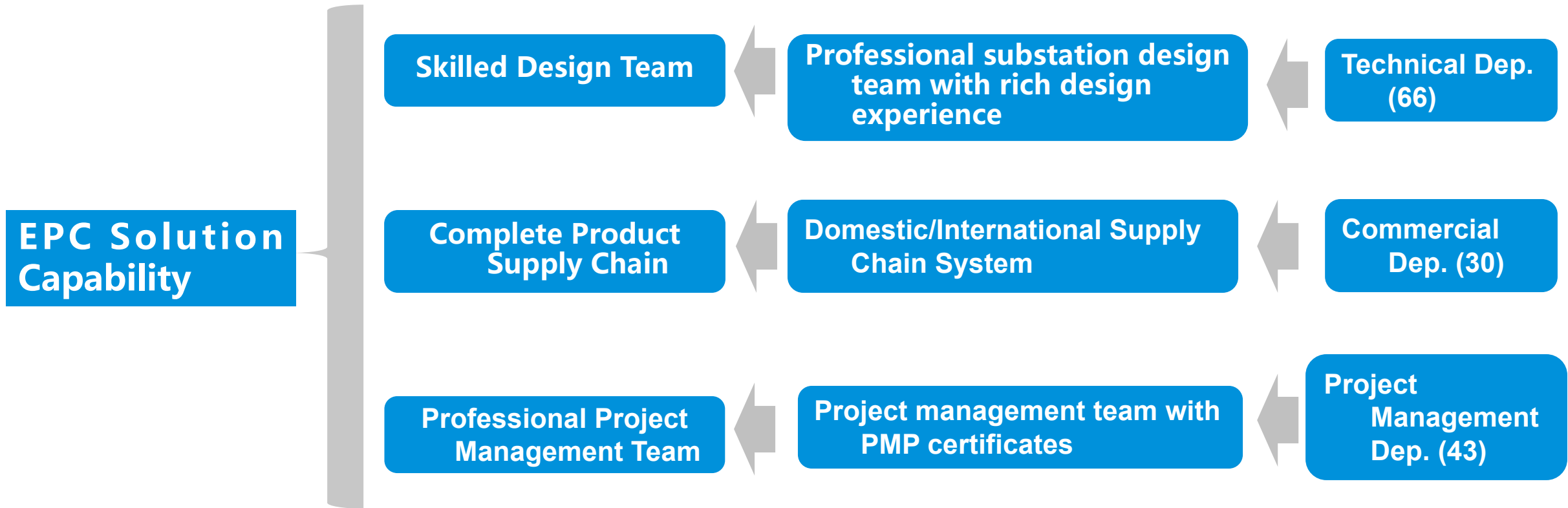
EPC





EPC Capability

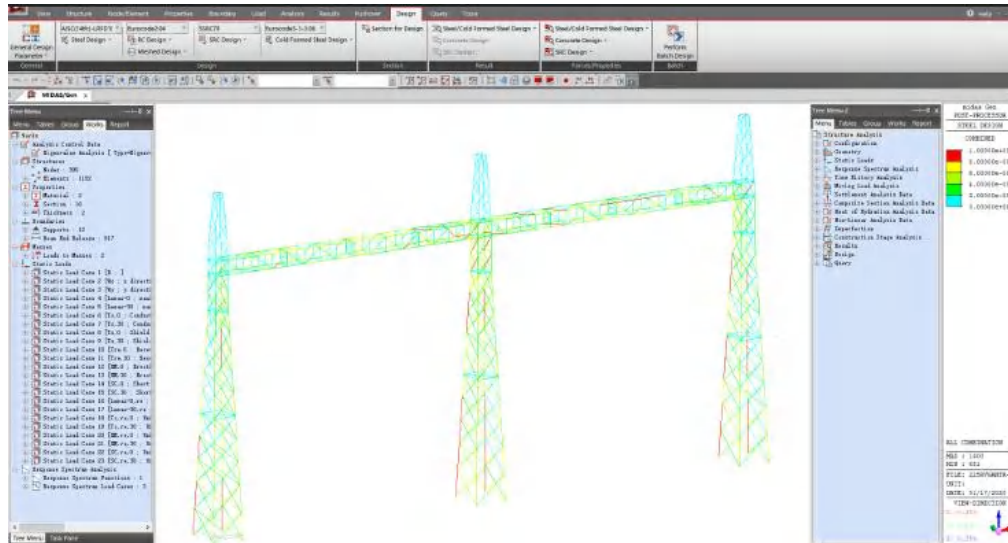
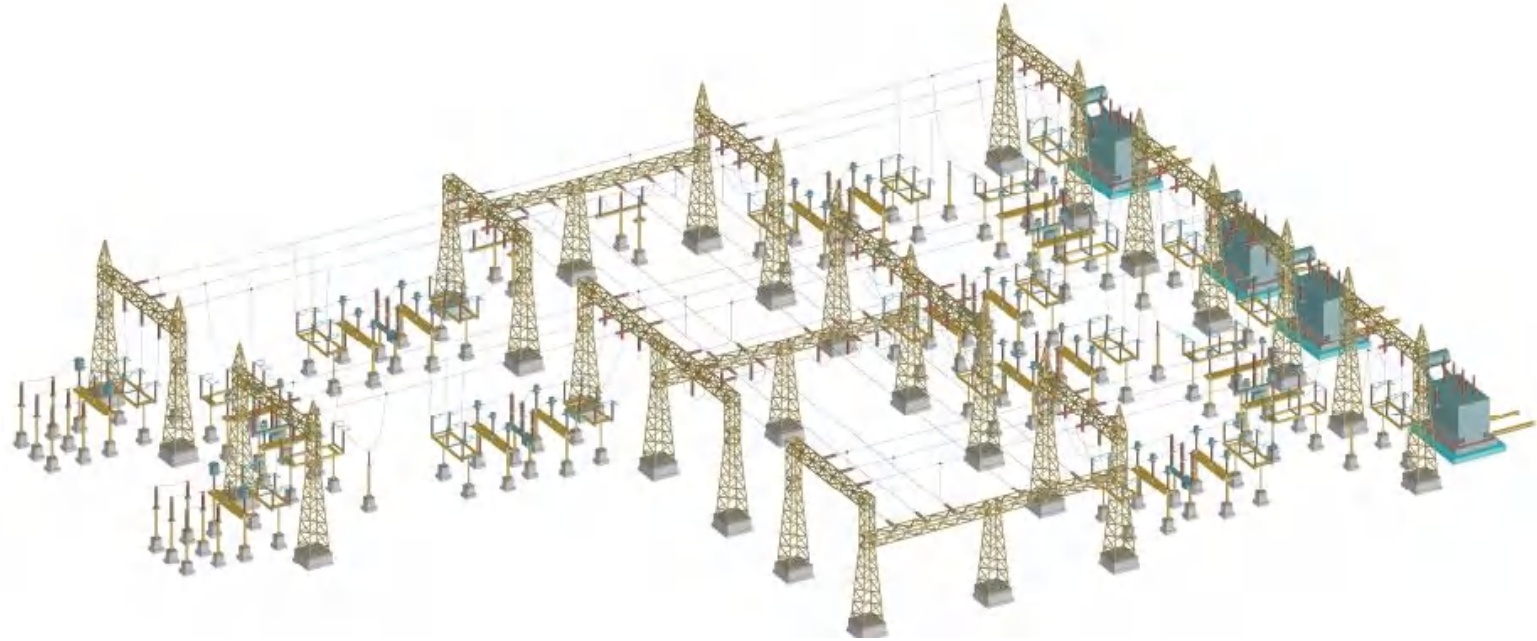
Sieyuan





EPC Capability up to 550kV

- Electric primary design in substations
- Electric secondary design in substations
- Electric design in both overhead transmission lines and underground cable lines
- Civil design in both substations and transmission lines
- Structure design in both substations and transmission lines
- Architecture design in substations
- Mechanical design in substations, etc



← MIDAS

PSCAD
Primtech 3D
Engineering Base
Auto CAD and Auto CAD MEP
PLS CADD and PLS TOWER
MIDAS
STAAD Pro
DIALUX, etc

↑
Primtech 3D



Applications-EPC

Pakistan



Ghana



Greece



Liberia



Kenya



Cote d'Ivoire



Philippines



Egypt



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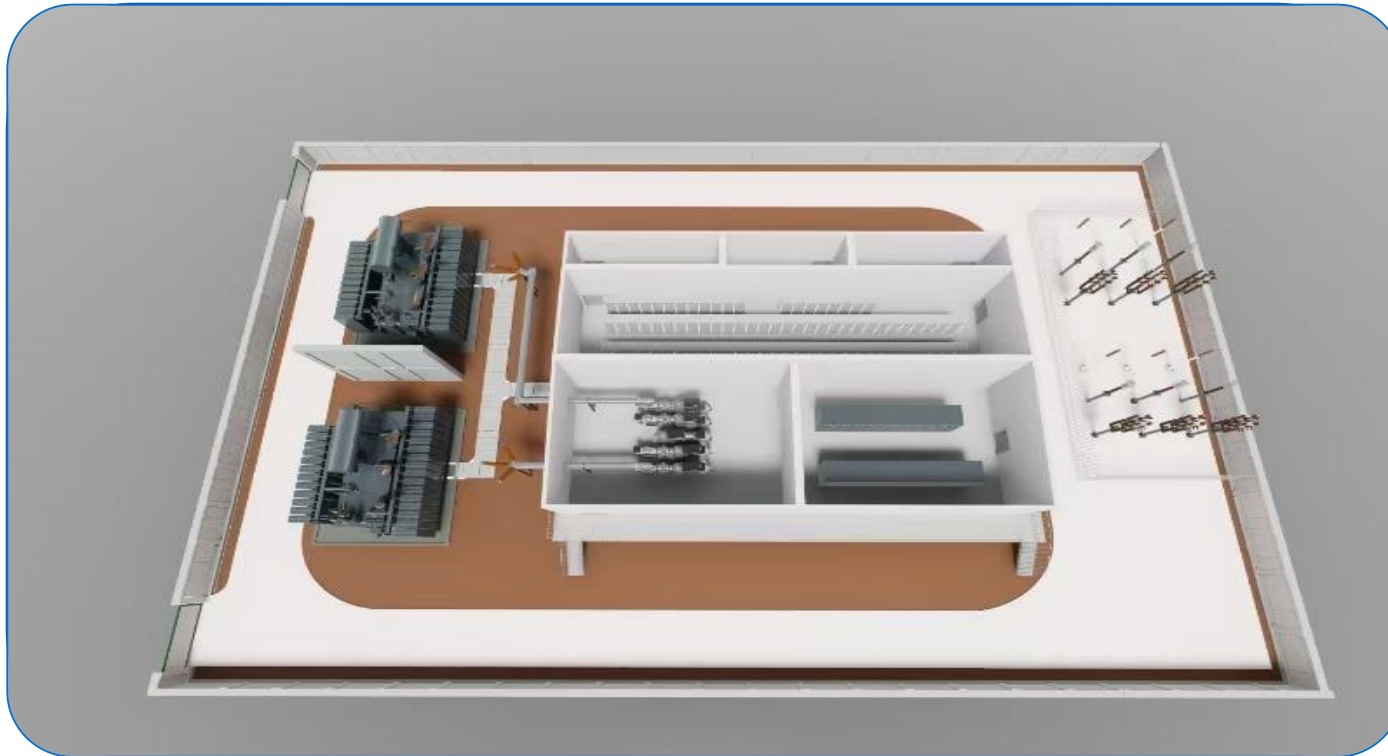
Applications





Definition

Put The Power Transformer, HV& LV Switchgear, Protection and Control panels, STATCOM, Grounding Transformer , Auxiliary Transformer and other primary and secondary equipments **in a common enclosure or a group of enclosures**, and the equipment is adjusted and tested according to the corresponding standards.



Common types of E-House:

- Power Transformer E-House
- GIS E-House
- Control and protection E-House
- Grounding Transformer E-House
- HV And LV Switchgear E-House
- STATCOM E-House
- Auxiliary transformer E-House
- Storage battery E-House
- Office House
- Living House

Maximize factory work and minimize field work.



The types of E-House

Integrated E-house



1. Save land area;
2. The E-House has a large maintenance space and is convenient for operation and maintenance;
3. Modules need to be installed on site.

Spliced E-house



1. Separate arrangement of E-House
2. Compact layout
3. No modules need to be installed on site

Application scenarios

Not only new energy projects, but most substations can actually adopt E-House Substation Solution.

Type	Description
Quick builded	Like new energy power generation projects, substations that require rapid construction and operation will recover their investment the earlier they are put into operation.
Limited space	In city or industrial centers, substations that require compact layout due to site limitations
Limited environmental conditions	Mountain areas, subsidence areas, scenic areas, limited by environmental conditions, can not use regular substation.
Temporary planed	Temporary use or periodic movement of substations.

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Sieyuan's E-House Solution

Sieyuan

Diverse products

Sieyuan can produce the main electrical equipment in substations with guaranteed quality, and our products have been recognized by various regions.

Design ability

Professional substation design team with rich design experience

R & D capabilities

Sieyuan's E-House is designed for overall solution design. We have many unique designs in terms of strength, water resistance, corrosion resistance, and condensation resistance.

Project management

Project management team with PMP certificates

Service

Our global engineering service center has service teams located all over the world.



Sieyuan having own manufacturing factories for the following products

NO.	Equipment
1	72.5kV~550kV GIS、 HGIS
2	66kV ~ 500kV Power transformer、 Vehicle-mounted transformer
3	35kV~220kV Neutral point equipment(including online monitoring)
4	Power quality enhancement equipment's: Capacitor、 Reactor、 SVG、 AF etc.
5	12~1000kV AIS: Circuit Breaker、 Disconnecter 、 Instrument Transformer
6	Grounding transformer and resistance complete set, arc suppression coil

NO.	Equipment
7	35kV Station transformer
8	40.5kV GIS Switchgear
9	12kV column circuit breaker set
10	protection and control system, SAS system
11	Prefabricated enclosure

Quickly provide you with high-quality substation equipment.





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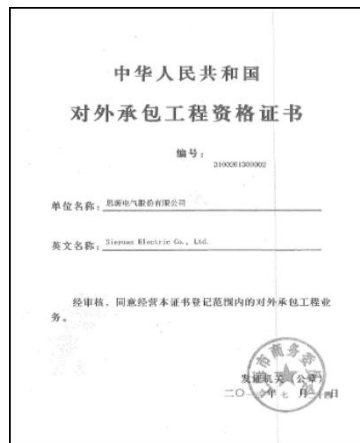
Service

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EPC Capability

Sieyuan

- ◆ National Certification Overseas Engineering Qualification
- ◆ Senior project manager and team of engineers
- ◆ Financing Project: Cooperation with Chinese Authoritative Institutions

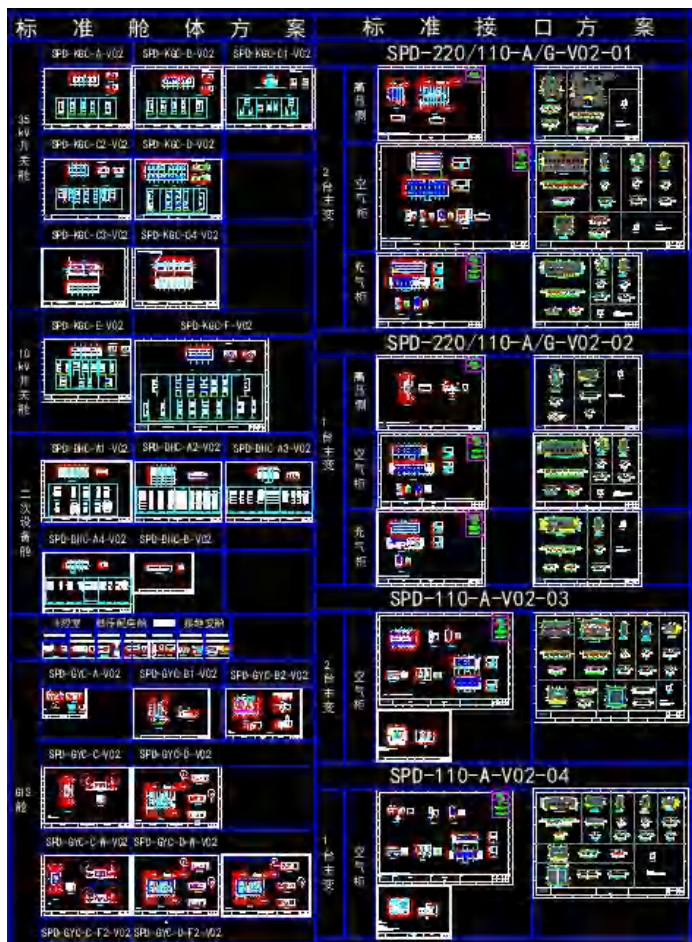


中华人民共和国商务部
Ministry of Commerce of the People's Republic of China

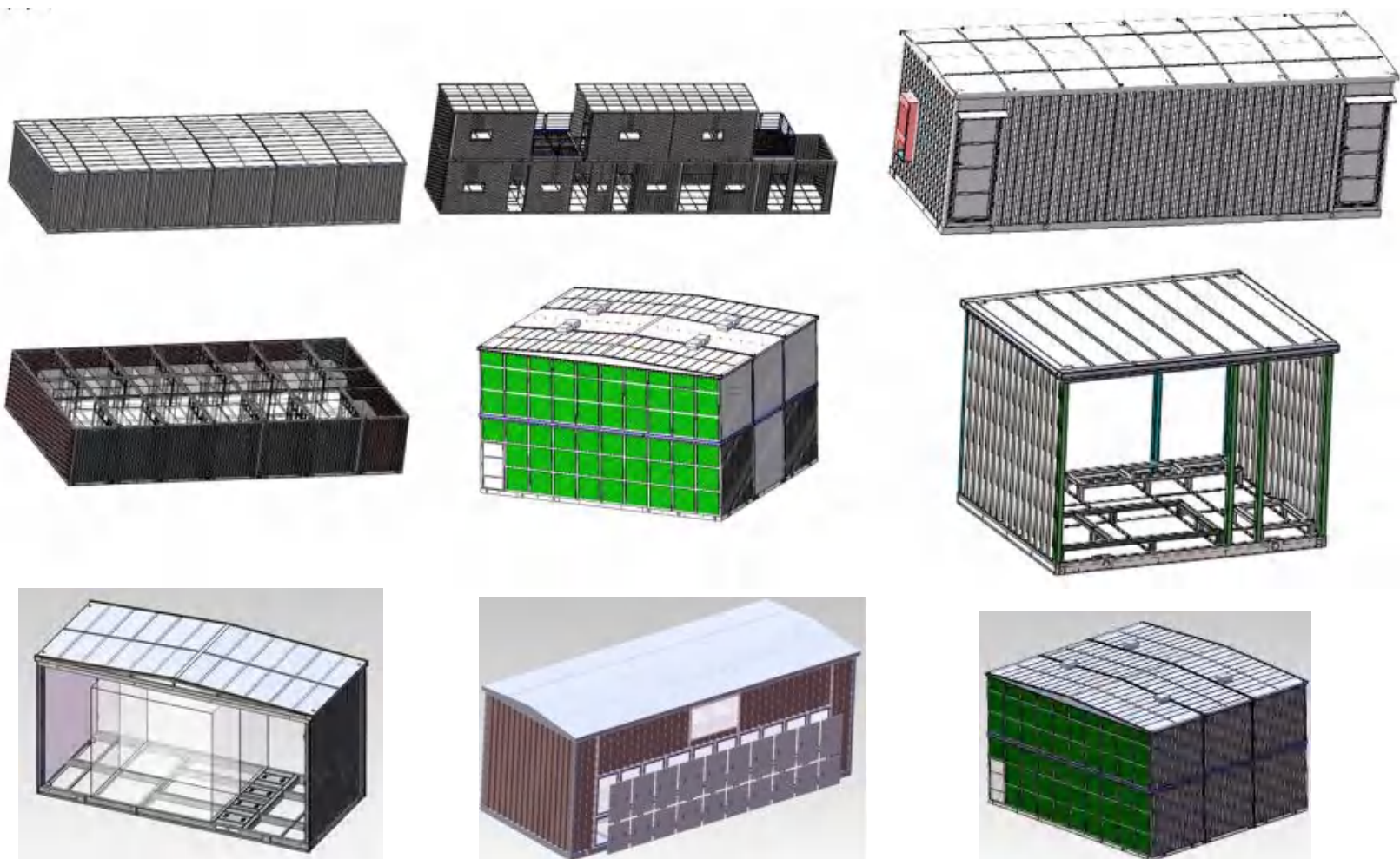




Electrical scheme



Structure Scheme





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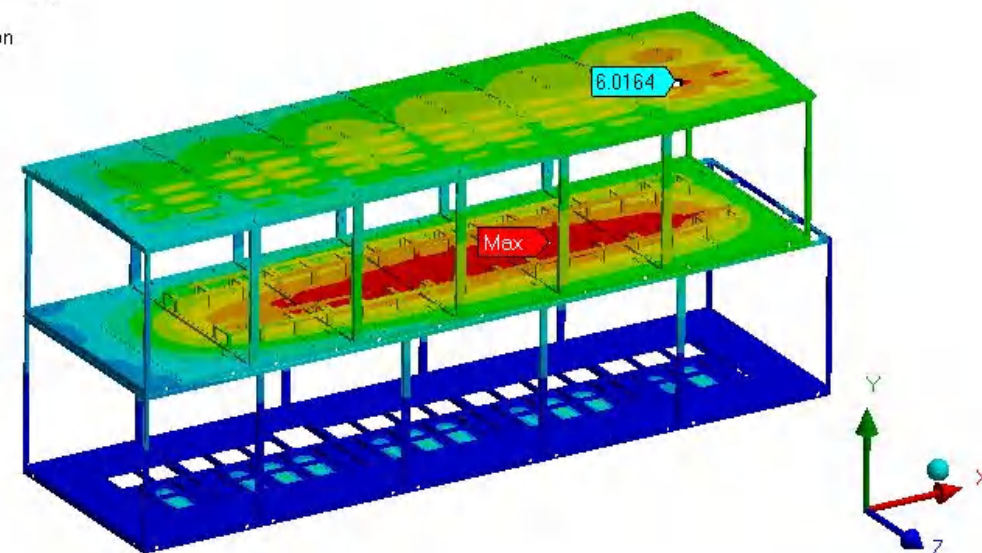


Key Technologies-Strength

- **Fortification intensity (seismic)** : standard 8 degrees (0.3g), the highest 9 degrees (0.4g);
- **Lifting**: meet the lifting strength of 1.5g, and consider the lifting unbalanced condition;
- **Wind resistance**: standard 35m/s (12 typhoons), up to 46m/s (14 strong typhoons);
- **Top load**: $\leq 2500\text{N/m}^2$;

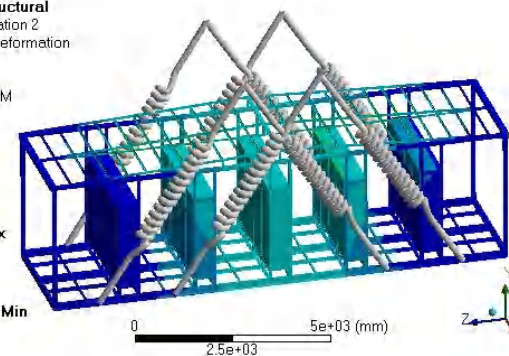
Total Deformation
Type: Total Deformation
Unit: mm
Time: 1

6.3989 Max
5.6879
4.9769
4.266
3.555
2.844
2.1331
1.4221
0.71113
0.00016047 Min

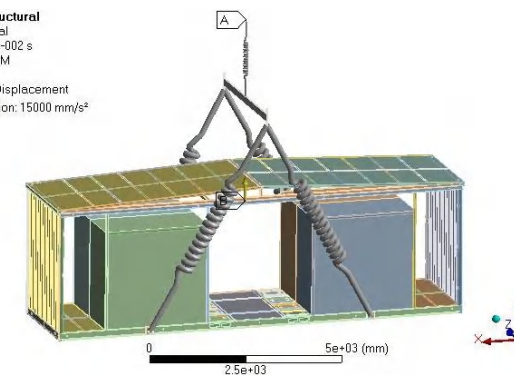


B: Static Structural
Total Deformation 2
Type: Total Deformation
Unit: mm
Time: 1
5/13/24 9:18 AM

20
20
17.565
15.13
12.695
9.94 Max
7.8253
5.3904
2.9554
0.52049 Min



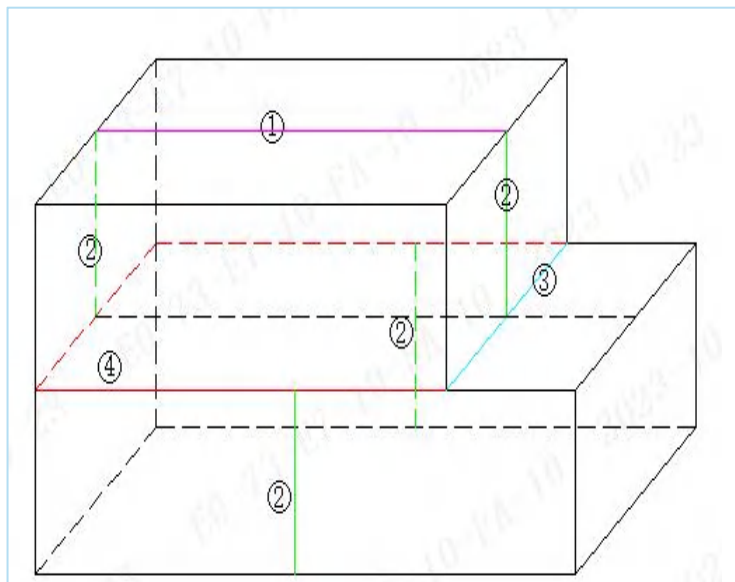
A: Static Structural
Static Structural
Time: 8.0983e-002 s
12/7/22 7:11 PM
[A] Remote Displacement
[B] Acceleration: 15000 mm/s²





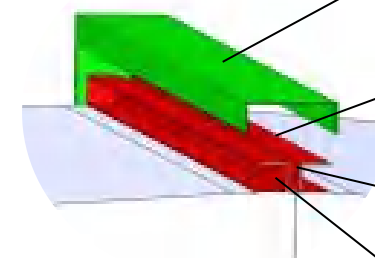
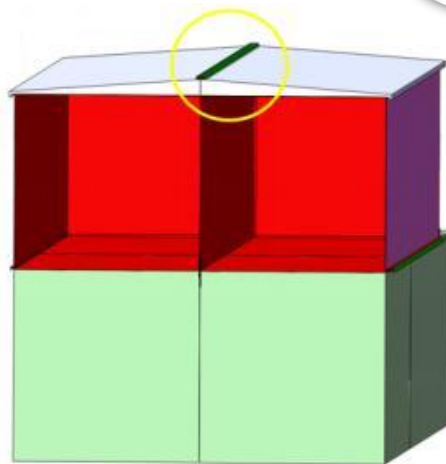
Key Technology - Dustproof And Waterproof

Five protective structures



- ①- Roof joint
- ② - side wall joint
- ③ -double deck joint
- ④ - double deck flat joint

1 2



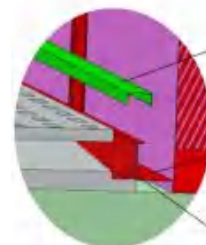
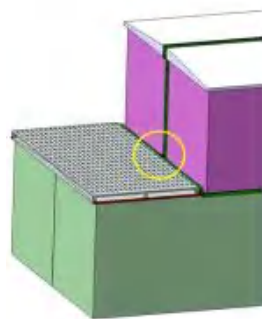
Waterproof cover plate
Field bolt installation

Waterproof stickers
Completely cover the sides with prefabricated waterproof cover panels

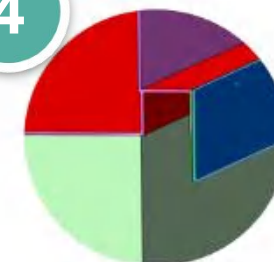
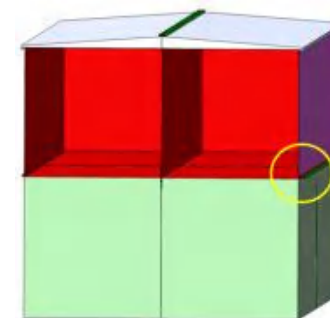
Gap Filling
Fill with blowing agent or sealant

Prefabricated waterproof board
Prefabricated waterproof board fully welded to cabin body

3



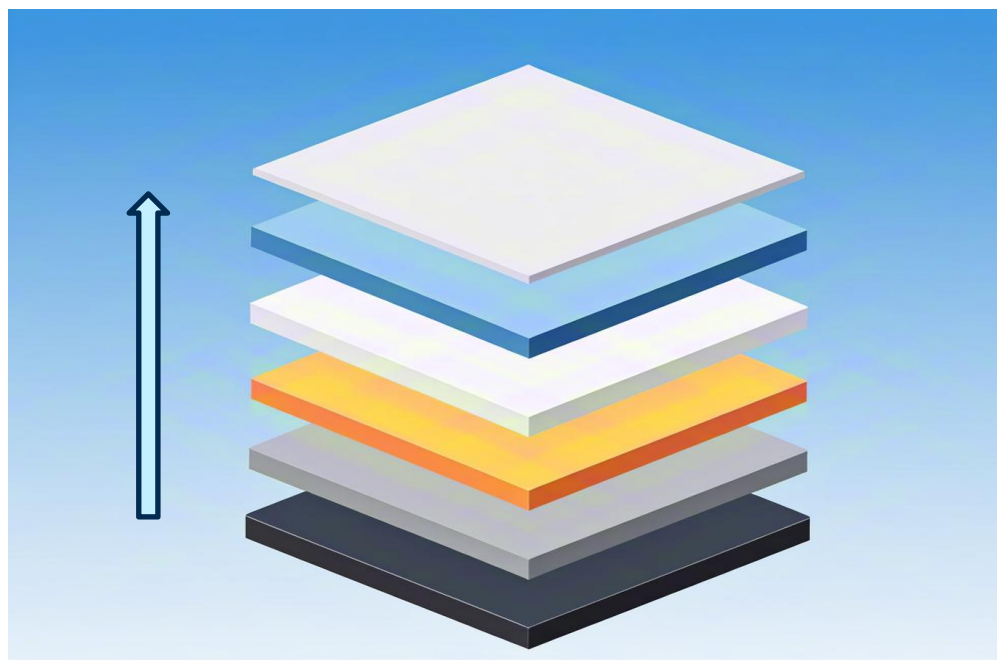
4





Key technology - Anti-Corrosion

- **Process:** base material sanding - sandblasting - primer - medium paint - top paint , 5 processes, strict implementation of ISO12944 anti-corrosion requirements;
- **Corrosion resistance:** 1680h neutral salt spray test, 55°C alternating humidity and heat + neutral salt spray 144h test;



ISO 12944-6:2018(E)

In cases when both test regimes' durations are defined either regime may be used.

Table 1 — Test procedures for paint systems applied to carbon steel, hot dip galvanized steel or steel with thermal-sprayed metallic coating for atmospheric corrosivity categories

Corrosivity category as defined in ISO 12944-2	Durability ranges according to ISO 12944-1	Test regime 1			Test regime 2
		ISO 2812-2 (water immersion) h	ISO 6270-1 (water condensation) h	ISO 9227 (neutral salt spray) h	Annex B (cyclic ageing test) h
C2	low	—	48	—	—
	medium	—	48	—	—
	high	—	120	—	—
	very high	—	240	480	—
C3	low	—	48	120	—
	medium	—	120	240	—
	high	—	240	480	—
	very high	—	480	720	—
C4	low	—	120	240	—
	medium	—	240	480	—
	high	—	480	720	—
	very high	—	720	1 440	1 680
C5	low	—	240	480	—
	medium	—	480	720	—
	high	—	720	1 440	1 680
	very high	—	—	—	2 688



Key technology - thermal insulation structure

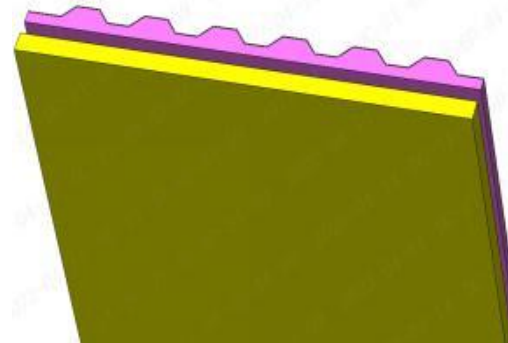
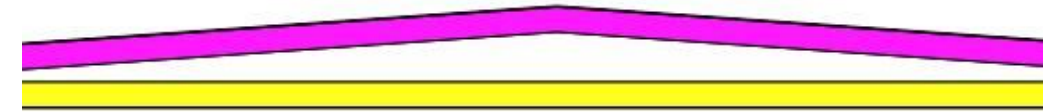
Multi-layer insulation structure can effectively reduce condensation risk and air conditioning configuration cost

➤ **Insulation structure:**

30mm flame retardant polyurethane foam - air layer - 50mm rock wool sandwich board (top cover);
30mm flame retardant polyurethane foam - air layer - 50mm rock wool sandwich board (side wall);
Overall wall thickness 150mm.

➤ **Insulation performance:**

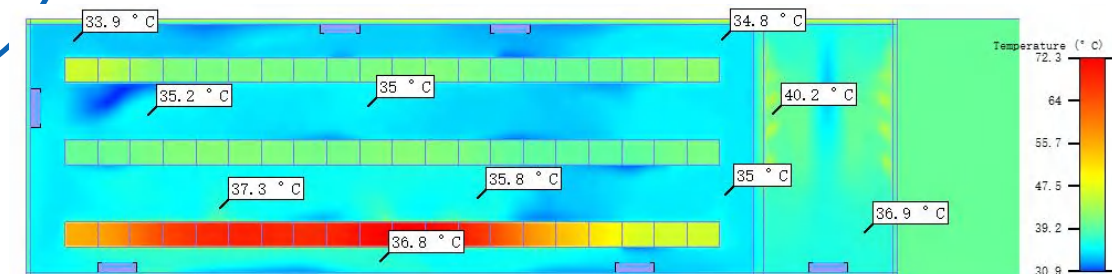
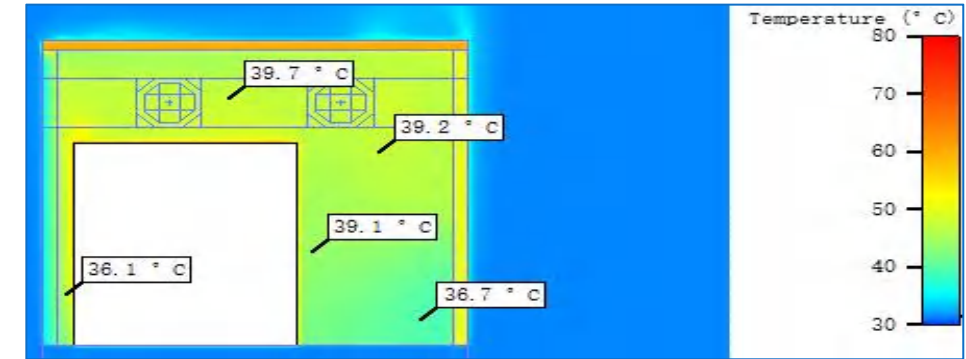
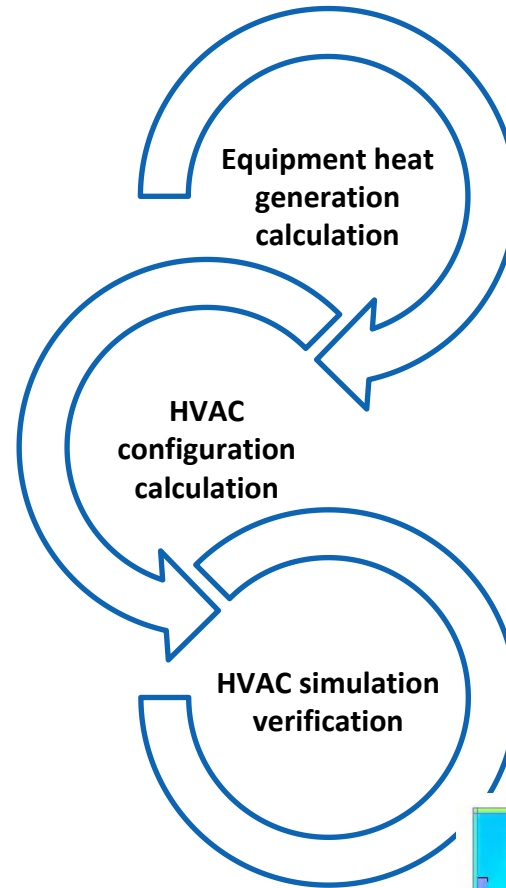
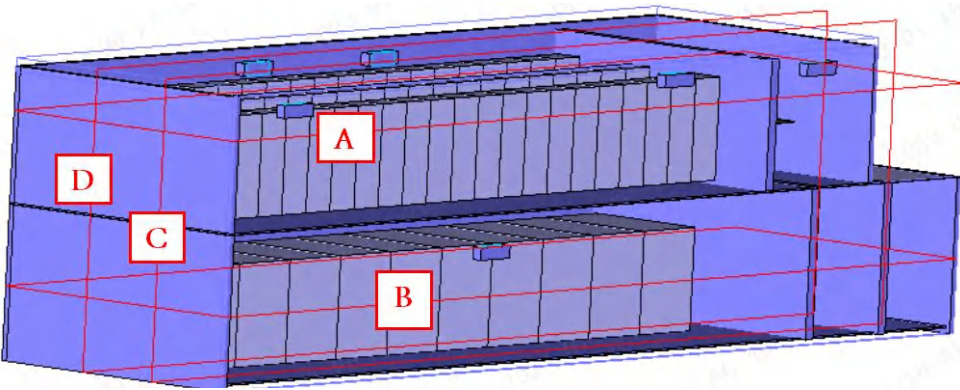
Thermal conductivity of rock wool: $0.04\text{W/m}\cdot\text{K}$, thermal conductivity of polyurethane: $0.034\text{W/m}\cdot\text{K}$,
The effect is better than 240mm concrete porous brick wall (thermal conductivity $0.78\text{W/m}\cdot\text{K}$).





Key Technology - thermal insulation structure

Sieyuan





Key Technologies - Test Reports



Inspection report issued by professional experimental institutions.



Key Technology - Product Development Patents



Continuous research and development of E-house



Sieyuan's E-House Solution

Sieyuan

Diverse products

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Design ability

Professional substation design team with rich design experience

R & D capabilities

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Project management

Project management team with PMP certificates

Service

Our global engineering service center has service teams located all over the world.



PMP



Project management
team with PMP
certificates 100+



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Typical Service- Sales and after sales service

Distribution of sales agencies

Representative offices in 39 overseas countries and regions



Personnel

The company is equipped with service personnel and spare parts for corresponding products in major provinces and cities, which can provide users with first-class technical services and after-sales service in a timely manner.

Quick response

The company's engineering and technical personnel will respond to remote technical services within 1 hour, and arrive at the scene within 24 hours



Quality assurance

During the quality assurance period, various technical services and free warranty are provided free of charge

Service Network

Established a global service center in Shanghai to provide customers with the fastest and best after-sales service



Service purposes

Customer interests come first
Meet customer needs to the greatest extent

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GIS+E-House Integration Solution

Sieyuan



Project name:

Datang Hebei Yangyuan
650MW Power Generation
Project

Project time: 2023

Substation type: New energy
booster station

Voltage level: 220kV

Scale: single busbar



Typical E-House of 110kV new energy substation

Sieyuan



Project name:
Huaneng Jiangxi Hutang
Township Photovoltaic
Substation

Project time: 2021

Substation type: New energy
booster station

Voltage level: 110kV

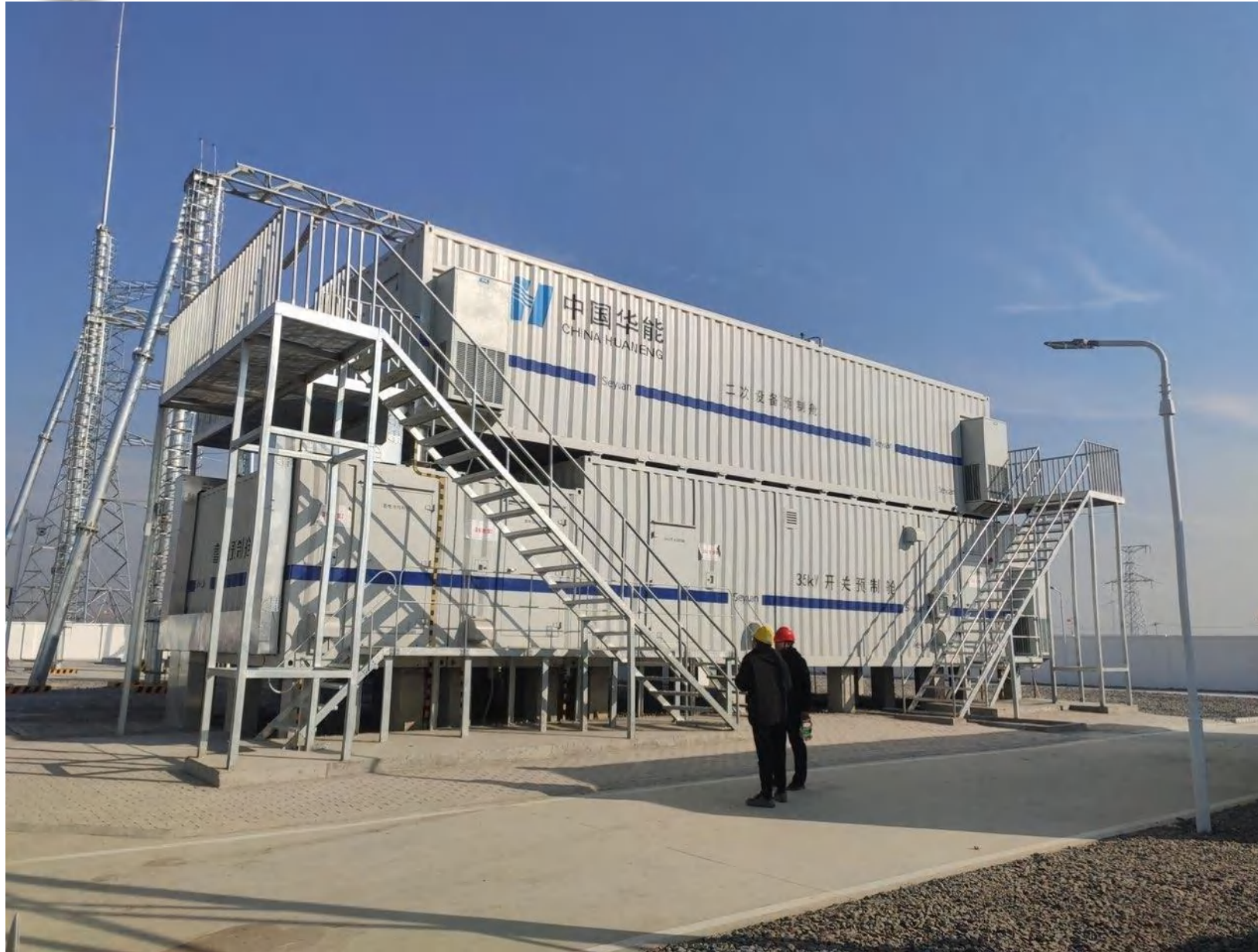
Scale:
110kV 1 in 1 out
1 × 120MVA transformer
12 × 35kV outgoing





Typical E-House of 220kV New Energy substation

Sieyuan



Project name:

Huaneng Anhui
Mengcheng Xuehu
Photovoltaic Project

Project time: 2021

Substation type: New
energy booster station

Voltage level: 220kV

Scale:

220kV 1 in 1 out
1 × 50MVA transformer
8 × 35kV outgoing



Typical Movable E-House of 110kV substation

Sieyuan



Project name:

Zhejiang Tiansheng Molten Salt Energy Storage 50T Demonstration Project 110kV Transmission and Transformation Project

Project Time: 2021

Substation type: Industrial engineering

Voltage level: 110kV

Scale:

220kV 1 in 2 out
2 × 50MVA transformer
22 × 10kV outgoing



Typical E-House of 110kV Data Center substation



Project :

Qinhuai East Garden 110kV
Data Center

Project Time: 2023

Substation type: Data
Center

Voltage level: 110kV

Scale:

110kV Single busbar
segmentation

4 × 63MVA transformer

48 × 10kV outgoing





Applications E-house

Sieyuan





Thank you

Sieyuan Electric Co., Ltd