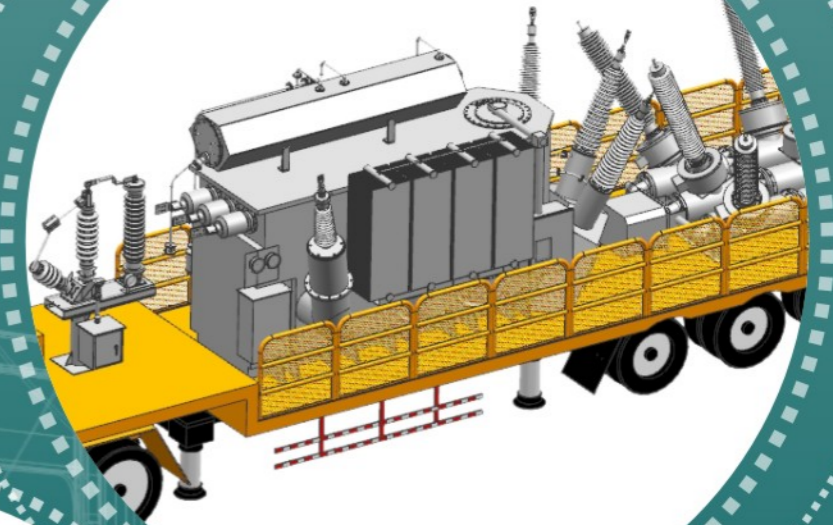




国家电网
STATE GRID

平高集团有限公司
PINGGAO GROUP CO., LTD

MOBILE SUBSTATION



address : No. 22, Nanhuan East Road, Pingdingshan, Henan
Website : <http://www.pinggao.com>
Sales Hotline : 0375-3806000
Fax : 0375-3803888 3506688
hotline : 0375-3806666
Zip code : 467001

平高集团有限公司
PINGGAO GROUP CO., LTD



 PINGGAO GROUP Co., Ltd.

- ◀ The largest R&D and manufacturing base of high voltage switchgear and complete equipment in China.
- ◀ China's high voltage switchgear technology leader with the world's leading technology level.
- ◀ The world's first 1,100 kV high voltage switchgear manufacturer.
- ◀ The equipment integrator engaged in investigation, design and production.
- ◀ With the internationally advanced industrial park and the world-leading modern product line.
- ◀ Devoted to providing the integrated solution for various industries such as power, railway, coal, oil, new energy and urban mass transit
- ◀ Innovative lease business model, shifting from manufacturing to operation.



国家电网
STATE GRID

平高集团有限公司
PINGGAO GROUP CO., LTD

Devotes to providing the users with
fast, flexible and reliable
integrated solutions for mobile substations

... ..



▶ SOLUTIONS FOR MOBILE SUBSTATIONS

OVERVIEW

The mobile substation is integrated with high voltage switchgear, transformer, medium voltage switchgear and secondary system in the transport vehicle, the integrated equipment with all substation functions, and can be rapidly transported to the electricity utilization site. After arriving at the site, they can be put into operation after the necessary commissioning and test.

PRODUCT

- ◀ Strong maneuverability
- ◀ High reliability
- ◀ Rapid deployment
- ◀ Economical

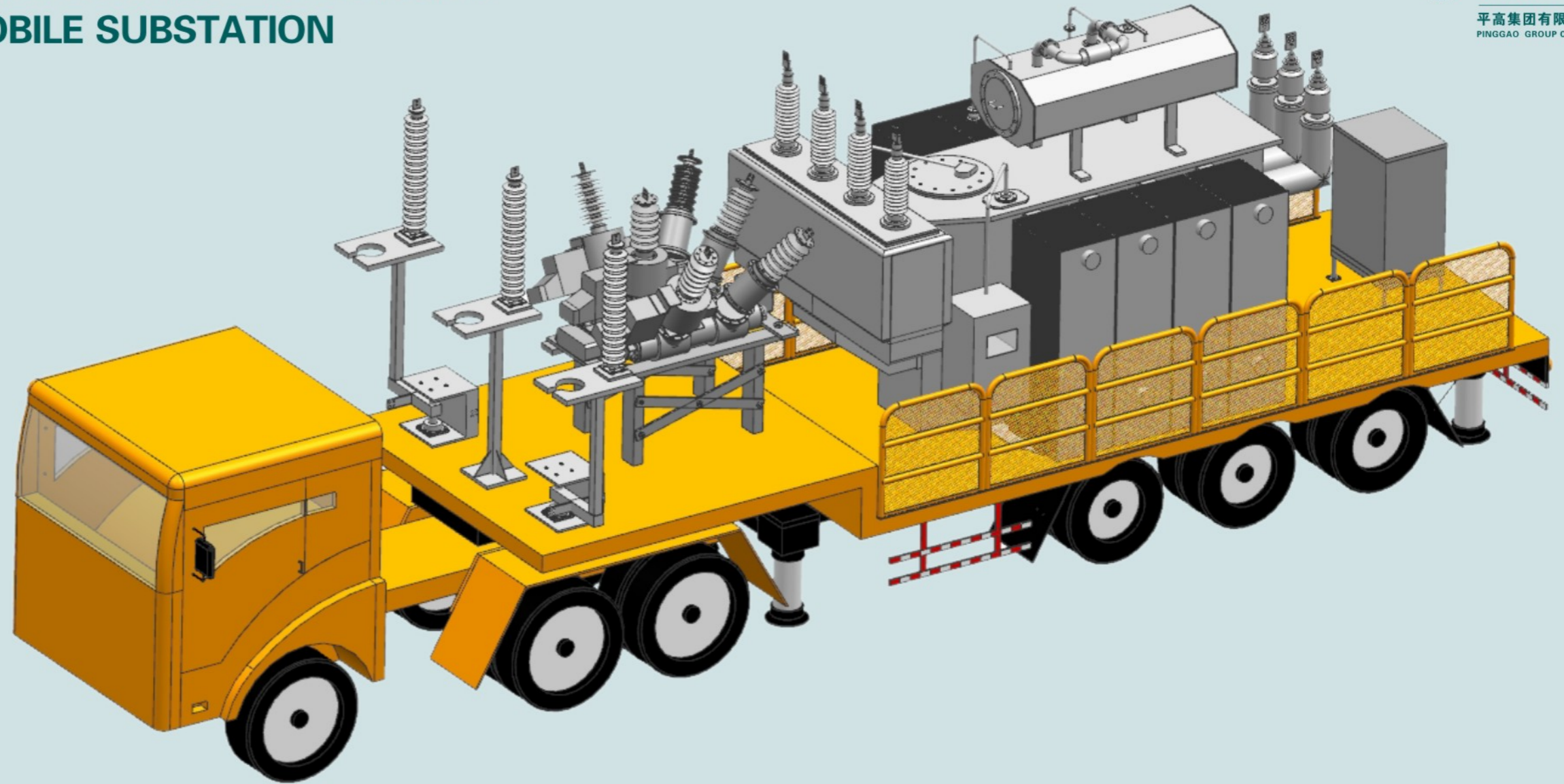
SCOPE OF APPLICATION

- ◀ Emergency power supply
 - Temporary capacity expansion
 - Emergency substation
- ◀ Medium and long term power supply
 - Substation maintenance
 - Substation expansion
 - Fixed substation

TYPICAL SOLUTIONS

- ◀ Emergency power supply
 - Solution I: 33 kV /15 MVA mobile substation
- ◀ Emergency power supply/Medium and long term power supply
 - Solution II: 132kV (66kV) /20MVA mobile substation
- ◀ Medium and long term power supply
 - Solution III: 132kV (66kV) /40MVA mobile substation(HGIS)
 - Solution IV: 132kV (66kV)/40MVA mobile substation(AIS)
 - Solution V: 230kV /50MVA mobile substation

EMERGENCY POWER SUPPLY – SOLUTION I: 33kV(10MVA) MOBILE SUBSTATION



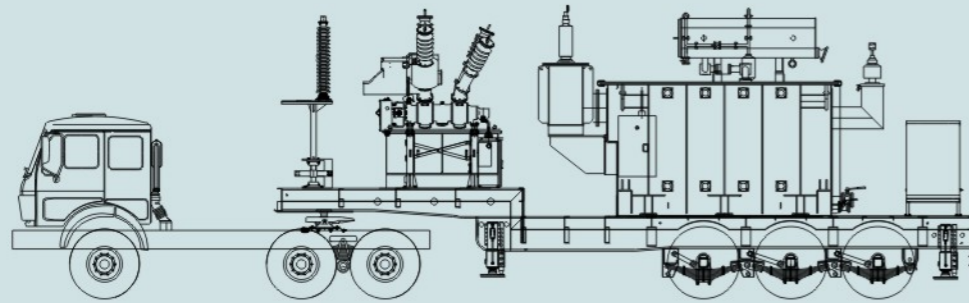
OVERVIEW OF THE SOLUTION

- ◀ Transformer capacity: 10 MVA; voltage class: 33kV/15kV.
- ◀ Single circuit line transformer unit wiring is adopted for 33 kV, the HGIS or switch cabinet equipment can be selected.
- ◀ Single-bus configuration is adopted for 15kV, and 4 circuits of feeder lines are arranged.
- ◀ Transformation vehicle module: 33kV HGIS, TR and LA.
 - Dimensions (L * W): 10.5m × 3 m; radius of turning circle (including the head): 7m.
- ◀ Distribution vehicle module: 15kV power distribution equipment and secondary system equipment.
 - Dimensions (L * W): 10.5m × 3 m; radius of turning circle (including the head): 7m.
- ◀ The total height of vehicle body and equipment complies with the national road transport provisions.

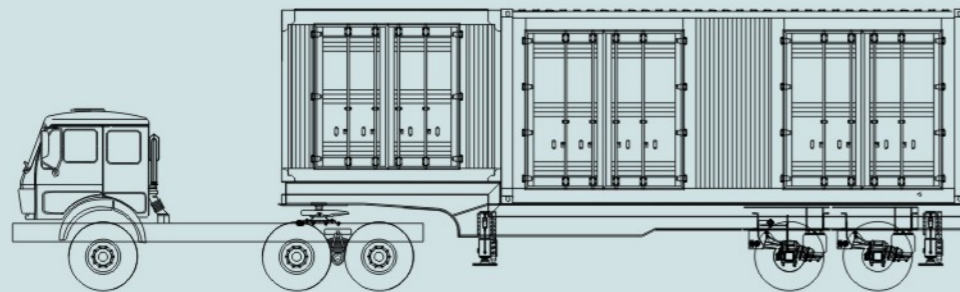


EMERGENCY POWER SUPPLY – SOLUTION I: 33kV(10MVA) MOBILE SUBSTATION

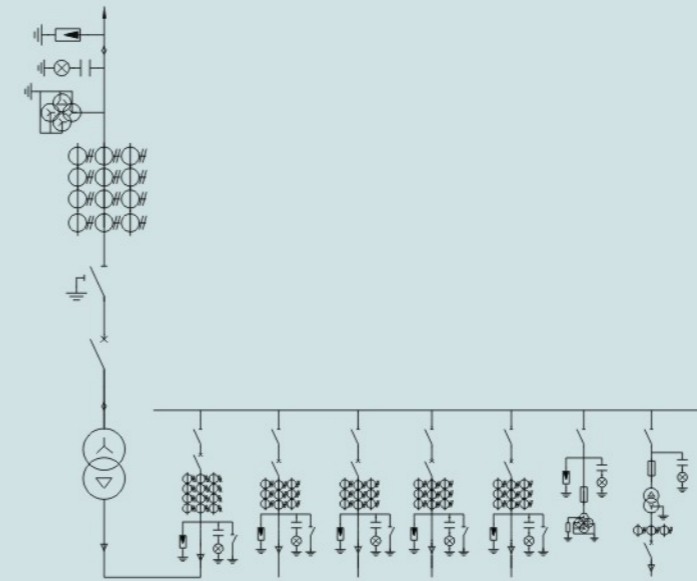
Layout of Transformation Vehicle



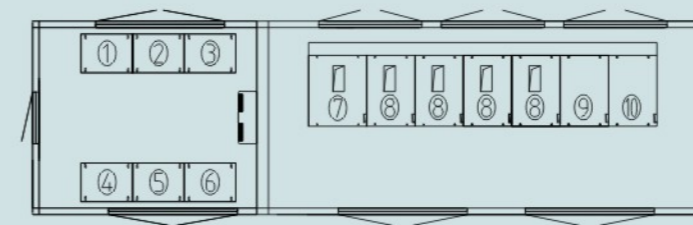
Layout of Distribution Vehicle



Main electrical connection



- ①Communication panel
- ②Monitoring panel
- ③Main transformer protection panel
- ④Auxiliary system panel
- ⑤DC panel
- ⑥Power supply panel
- ⑦Incoming cabinet
- ⑧Outgoing cabinet
- ⑨PT cabinet
- ⑩Station transformer cabinet



SOLUTION CONFIGURATION

◀Transformer

- Model: SZ-10000/33
- The compact design reduces the boundary dimensions.
- The internal part of transformer is of damping structure.

◀33kV switchgear

- Gas-insulated miniaturized switchgear, effectively preventing the influence of fouling and moisture.
- Cabinet-type switch is fully insulated, fully sealed and maintenance-free.
- Cabinet-type switch adopts modular design, the connection can be used for quick release mode, such as prefabricated optical cables and prefabricated power cables.

◀15kV switch cabinet

- 15kV switch cabinet can be box-type fixed switchgear or gas insulated cabinet.
- It has high mechanical strength that can meet the requirement for long distance carriage.

●The quick release cables are used for wiring, and the wiring is flexible.

●Professional maintenance platform is arranged for facilitating the repair, operation maintenance.

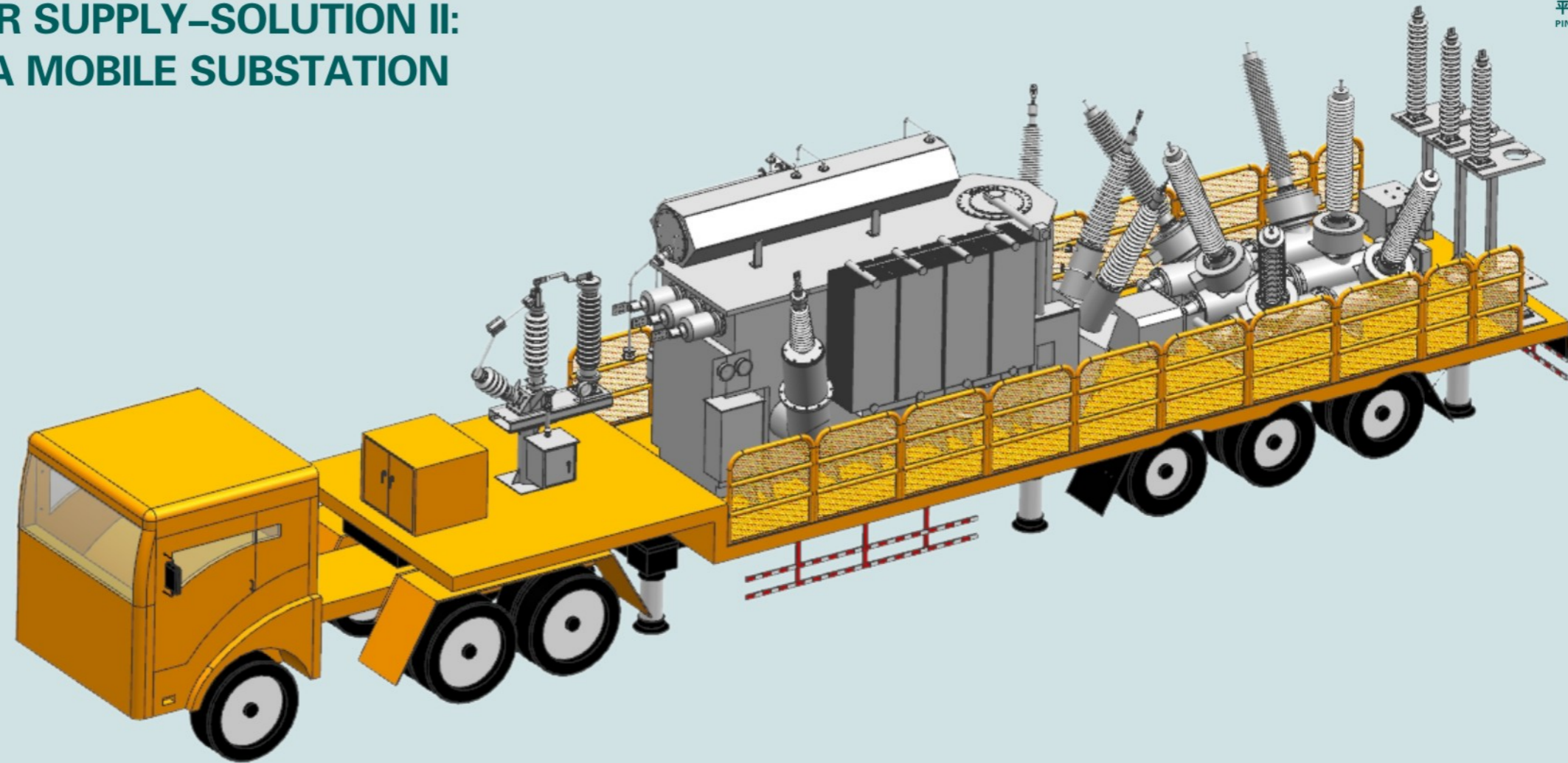
◀Transport vehicle

- The low slab or high slab transport vehicle can be selected.
- The leaf spring suspension system, hydraulic suspension system or air suspension system can be selected.
- Relevant matters, such as vehicle announcement and license can be handled according to the requirements.

◀Optional accessories

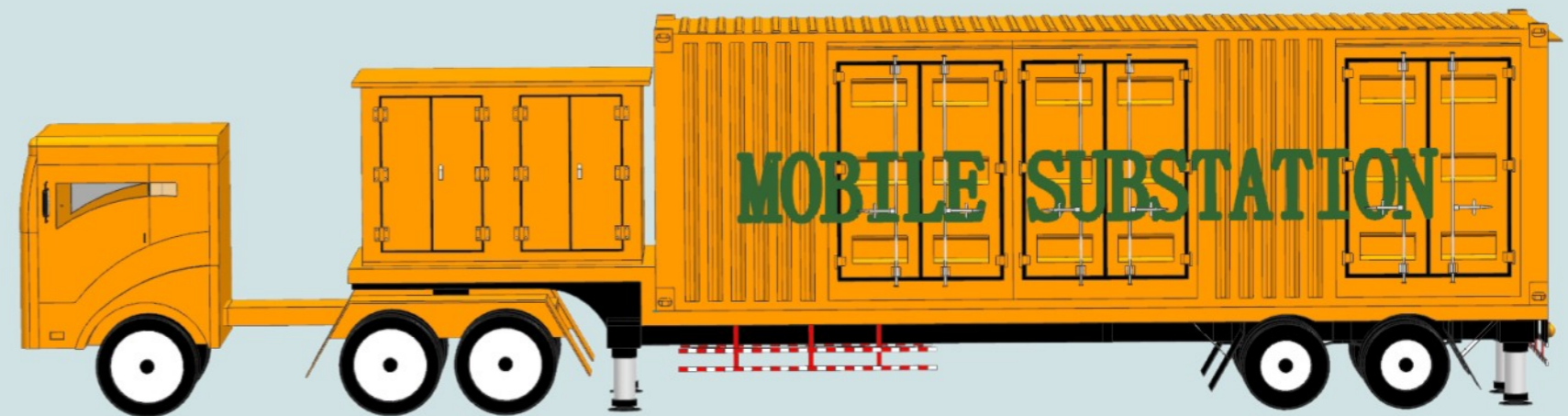
- 3D impact recorder
- Motor-driven cable reel
- Working ladder
- Firefighting apparatus
- Mobile lightning conductor
- SF₆ filling and deflating device
- Lifting light and video monitoring system
- Telescopic fence
- Oil chromatography on-line monitoring system
- SF₆ status on-line monitoring system
- Communication and background monitoring system

EMERGENCY POWER SUPPLY/MEDIUM AND LONG TERM POWER SUPPLY-SOLUTION II: 132kV(66kV)/20MVA MOBILE SUBSTATION



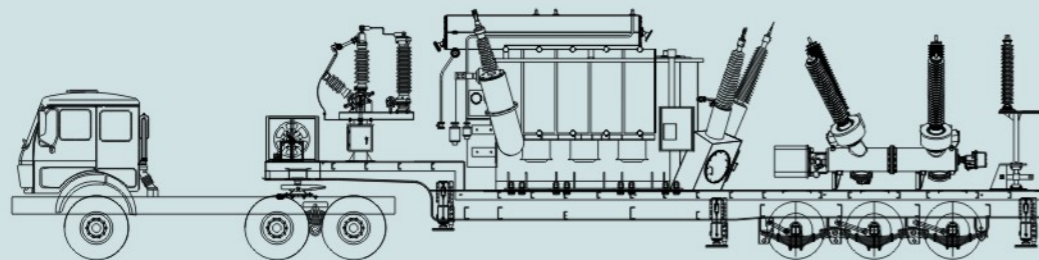
OVERVIEW OF THE SOLUTION

- ◀ Transformer capacity: 20 MVA; voltage class: 132kV(66kV)/15kV.
- ◀ Single circuit line transformer unit wiring is adopted for 132kV(66kV) , the HGIS/GIS equipment is selected, and the complete outdoor arrangement is selected.
- ◀ Single-bus configuration is adopted for 15kV, and 4~6 circuits of feeder lines are arranged.
- ◀ Transformation vehicle module: 132kV(66kV) HGIS, TR ,LA,neutral-point device and motor-driven cable reel.
 - Dimensions (L * W): 13 m × 3 m; radius of turning circle (including the head): 10.5 m.
- ◀ Distribution vehicle module:15kV power distribution equipment,secondary system equipment and motor-driven cable reel.
 - Dimensions (L * W): 13 m × 3 m; radius of turning circle (including the head): 10.5 m.
- ◀ The total height of vehicle body and equipment complies with the national road transport provisions.

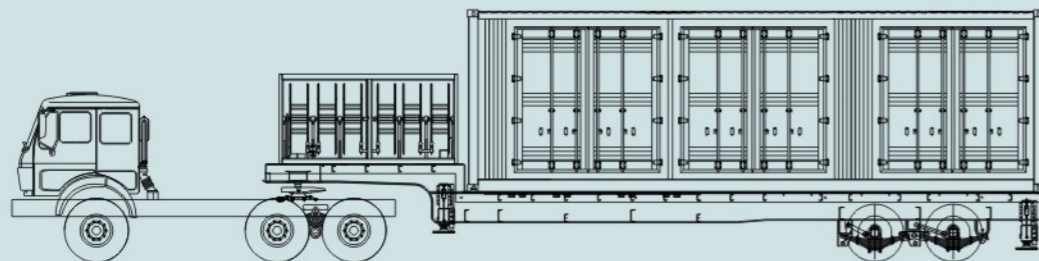


EMERGENCY POWER SUPPLY/MEDIUM AND LONG TERM POWER SUPPLY-SOLUTION II: 132kV(66kV)/20MVA MOBILE SUBSTATION

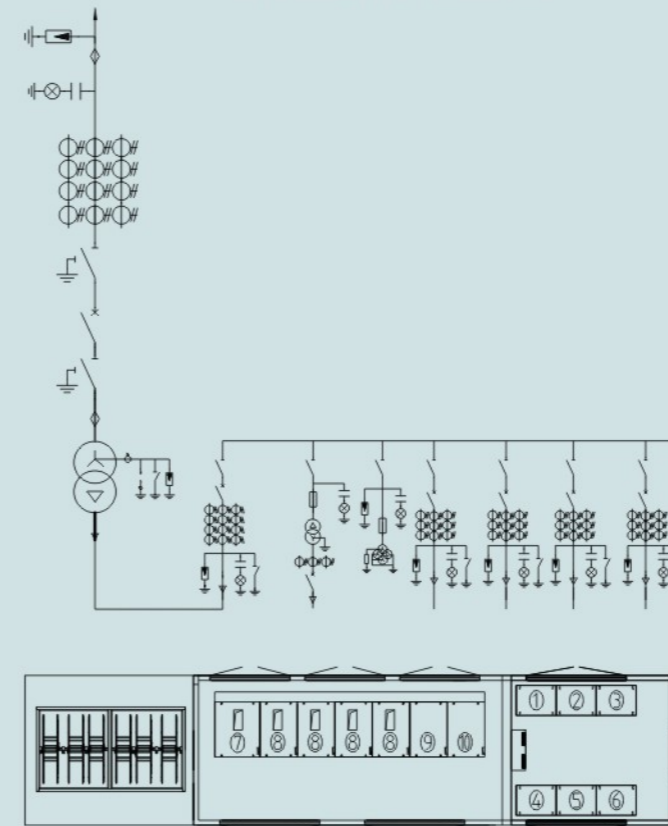
Layout of Transformation Vehicle



Layout of Distribution Vehicle



Main electrical connection



- ①Communication panel
- ②Monitoring panel
- ③Main transformer protection panel
- ④Auxiliary system panel
- ⑤DC panel
- ⑥Power supply panel
- ⑦Incoming cabinet
- ⑧Outgoing cabinet
- ⑨PT cabinet
- ⑩Station transformer cabinet

SOLUTION CONFIGURATION

Transformer

- Model: SFZ-20000/132kV(66kV)
- Air-cooled transformer is selected to reduce the overall dimensions.
- The compact design reduces the boundary dimensions.
- The internal part of transformer is of damping structure.
- The transformer bushing is a compound insulation bushing, which reduces the weight.
- Transformer bushing and iron core are of reinforced design.
- 3D impact recorder is installed.

132kV(66kV) high voltage switchgear

- High voltage switchgear is characterized with SF₆ insulation, high electrical performance and large safety margin.
- It is of the integral seal design, waterproof and dampproof, the equipment materials and coating are corrosion resistant and foul resistant. It is suitable for multi-regional and long-time transportation.
- The height of support is lowered, the equipment is of miniaturization design, the weight is light, the installation and transportation are convenient.

- Flexible connection mode: optional overhead or cable terminal.

15kV switch cabinet

- 15kV switch cabinet can be box-type fixed switchgear or gas insulated cabinet.
- It has high mechanical strength that can meet the requirement for long distance carriage.
- The quick release cables are used for wiring, and the wiring is flexible.
- Professional maintenance platform is arranged for facilitating the repair and operation maintenance.

Transport vehicle

- The low slab or high slab transport vehicle can be selected.
- The leaf spring suspension system, hydraulic suspension system or air suspension system can be selected.
- Relevant matters, such as vehicle announcement and license can be handled according to the requirements.

Optional accessories

- Motor-driven cable reel
- Working ladder
- Telescopic fence
- Mobile lightning conductor
- Communication and background monitoring system
- Lifting light and video monitoring system
- Oil chromatography on-line monitoring system
- SF₆ filling and deflating device
- SF₆ status on-line monitoring system
- Firefighting apparatus

▶ **MEDIUM AND LONG TERM POWER
SUPPLY-SOLUTION III:
132kV(66kV)/40MVA MOBILE
SUBSTATION(HGIS)**

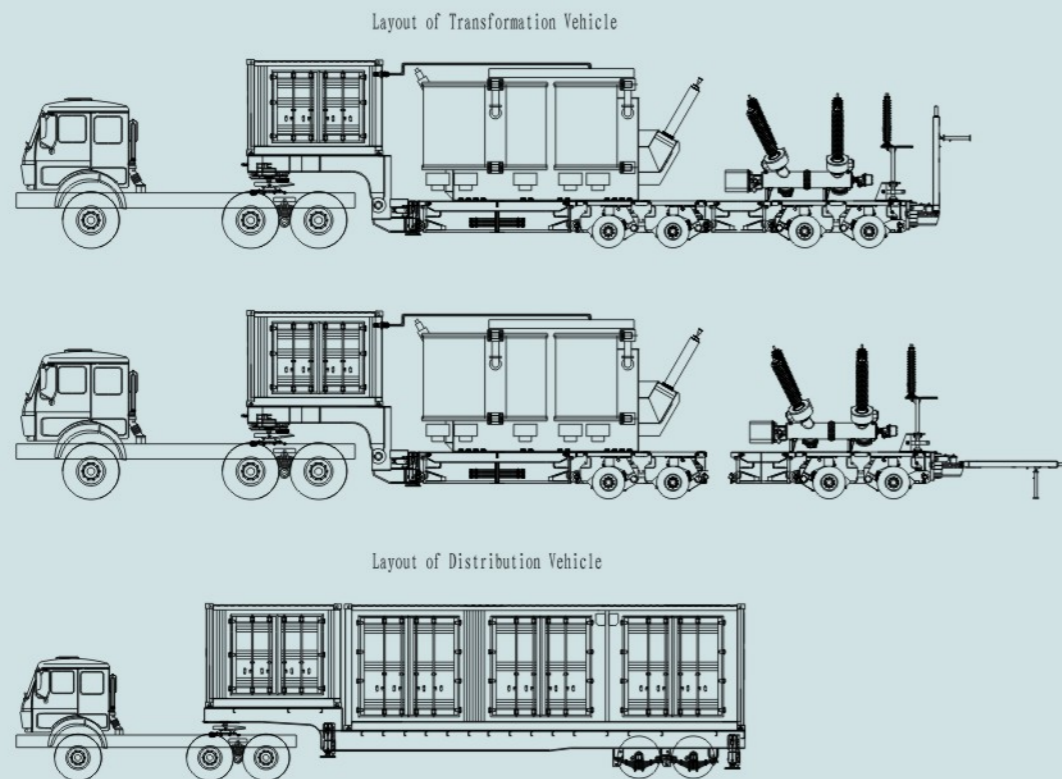


**OVERVIEW OF
THE SOLUTION**

- ◀ Transformer capacity: 40 MVA; voltage class: 132kV(66kV)/15kV.
- ◀ Single circuit line transformer unit wiring is adopted for 132kV(66kV), the HGIS/GIS equipment is selected, and the complete outdoor arrangement is selected.
- ◀ Single-bus configuration is adopted for 15kV, and 4 ~ 10 circuits of feeder lines are arranged.
- ◀ Transformation vehicle module: 132kV(66kV) HGIS, TR ,LA.
 - Dimensions (L * W): 16 m × 3 m; radius of turning circle (including the head): 13 m.
- ◀ Distribution vehicle module: 15kV power distribution equipment and secondary system equipment.
 - Dimensions (L * W): 13 m * 3 m; radius of turning circle (including the head): 10.5 m.
- ◀ The total height of vehicle body and equipment complies with the national road transport provisions.



► MEDIUM AND LONG TERM POWER SUPPLY-SOLUTION III: 132kV(66kV)/40MVA MOBILE SUBSTATION(HGIS)



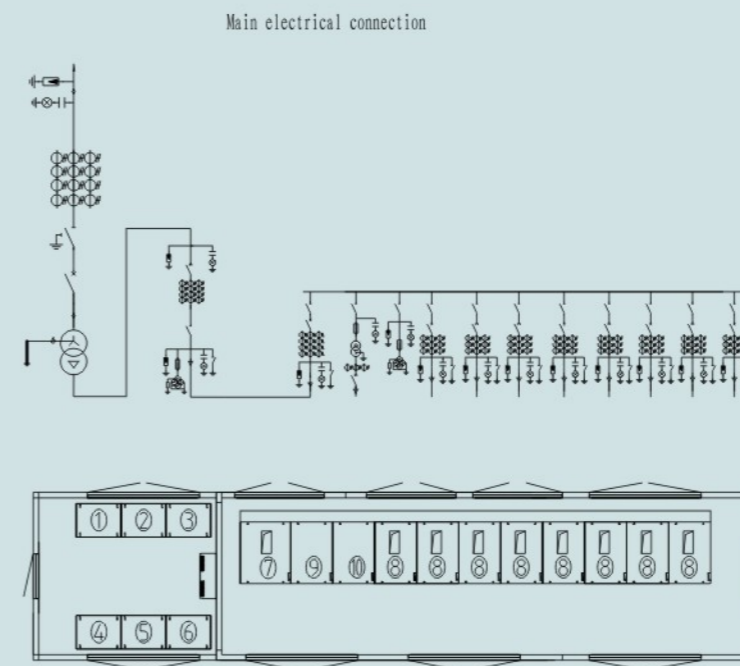
SOLUTION CONFIGURATION

◀ Transformer

- Model: SFZ-40000/132kV(66kV)
- Air-cooled transformer is selected to reduce the overall dimensions.
- The compact design reduces the boundary dimensions.
- The internal part of transformer is of damping structure.
- The transformer bushing is a compound insulation bushing, which reduces the weight.
- Transformer bushing and iron core are of reinforced design.
- 3D impact recorder is installed.

◀ 132kV(66kV) high voltage switchgear

- High voltage switchgear is characterized with SF₆ insulation, high electrical performance and large safety margin.



- ① Communication panel
- ② Monitoring panel
- ③ Main transformer protection panel
- ④ Auxiliary system panel
- ⑤ DC panel
- ⑥ Power supply panel
- ⑦ Incoming cabinet
- ⑧ Outgoing cabinet
- ⑨ PT cabinet
- ⑩ Station transformer cabinet

● It is of the integral seal design, waterproof and dampproof, the equipment materials and coating are corrosion resistant and foul resistant. It is suitable for multi-regional and long-time transportation.

● The height of support is lowered, the equipment is of miniaturization design, the weight is light, the installation and transportation are convenient.

● Flexible connection mode: optional overhead or cable terminal.

◀ 15kV switch cabinet

- 15kV switch cabinet can be box-type fixed switchgear or gas insulated cabinet.
- It has high mechanical strength that can meet the requirement for long distance carriage.
- The quick release cables are used for wiring, and the wiring is flexible.
- Professional maintenance platform is arranged for facilitating the repair and operation maintenance.

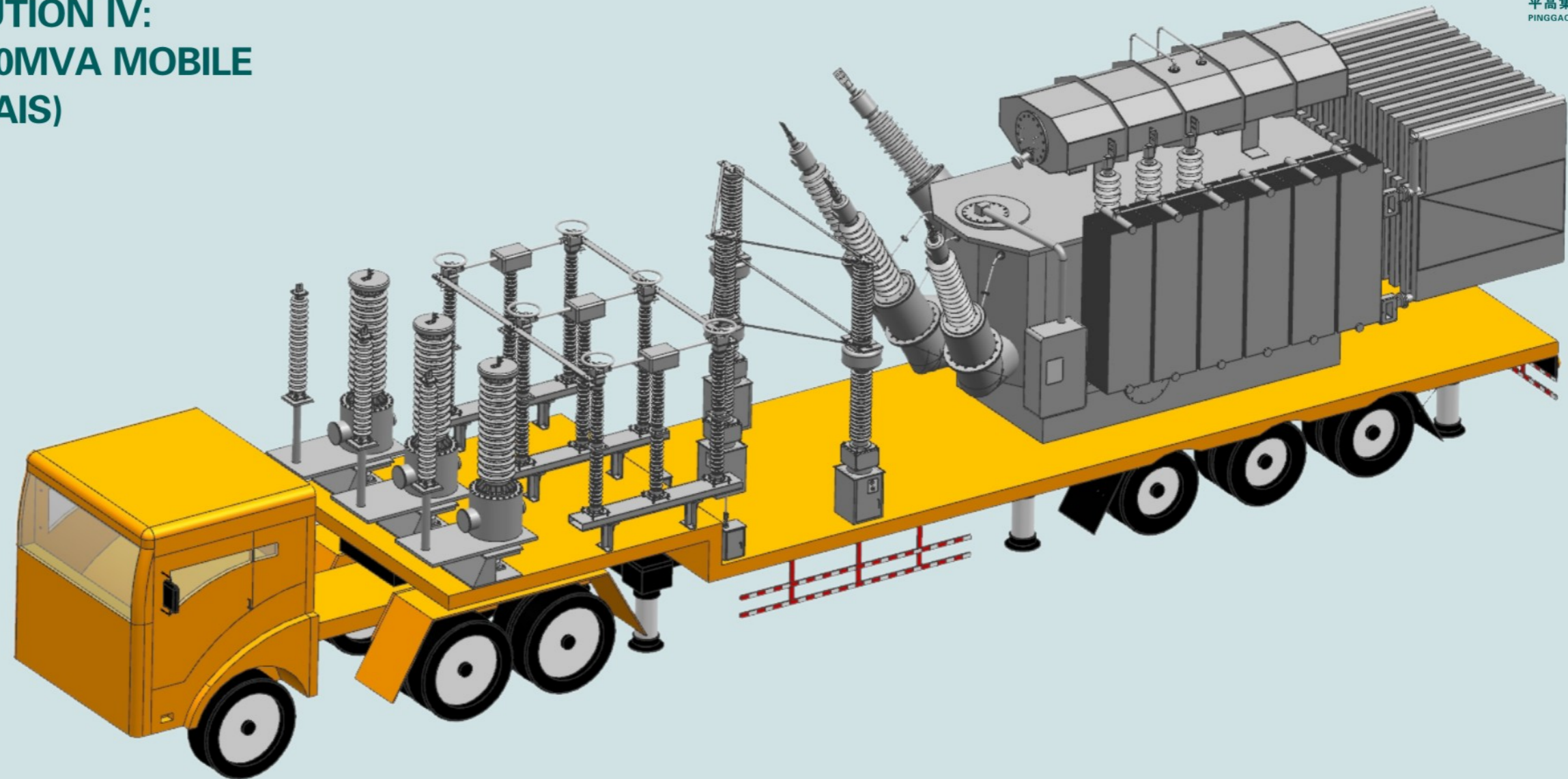
◀ Transport vehicle

- The low slab or high slab transport vehicle can be selected.
- The leaf spring suspension system, hydraulic suspension system or air suspension system can be selected.
- Detachable transport vehicle can be selected for high voltage substation vehicle with hydraulic suspension system.

◀ Optional accessories

- Motor-driven cable reel
- Working ladder
- Telescopic fence
- Firefighting apparatus
- SF₆ status on-line monitoring system
- Mobile lightning conductor
- Lifting light and video monitoring system
- Oil chromatography on-line monitoring system
- SF₆ filling and deflating device
- Communication and background monitoring system

▶ **MEDIUM AND LONG TERM POWER
SUPPLY-SOLUTION IV:
132kV(66kV)/40MVA MOBILE
SUBSTATION(AIS)**



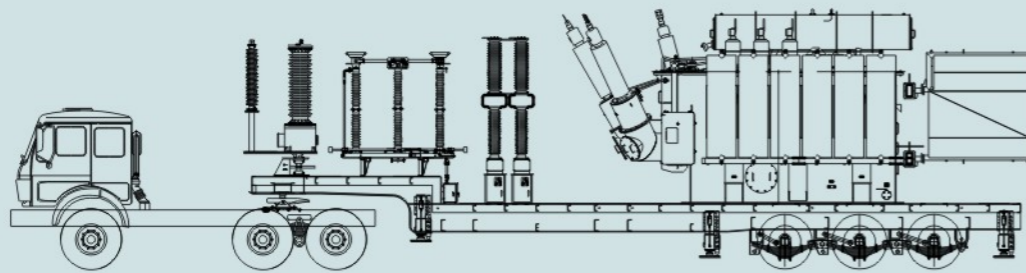
**OVERVIEW OF
THE SOLUTION**

- ◀ Transformer capacity: 40MVA, voltage class: 132kV(66kV)/15kV.
- ◀ Single circuit line transformer unit wiring is adopted for 132kV(66kV), the AIS equipment is selected, and the complete outdoor arrangement is selected.
- ◀ Single-bus configuration is adopted for 15kV, and 4 ~ 10 circuits of feeder lines are arranged.
- ◀ Transformation vehicle module: 132kV(66kV)CB,DS,ES,LA,TV,TR.
 - Dimensions (L * W): 16m x 3m, radius of turning circle (including the head): 13m.
- ◀ Distribution vehicle module: 15kV power distribution equipment and secondary system equipment.
 - Dimensions (L * W): 13m x 3m, radius of turning circle (including the head): 10.5m.
- ◀ The total height of vehicle body and equipment complies with the national road transport provisions.

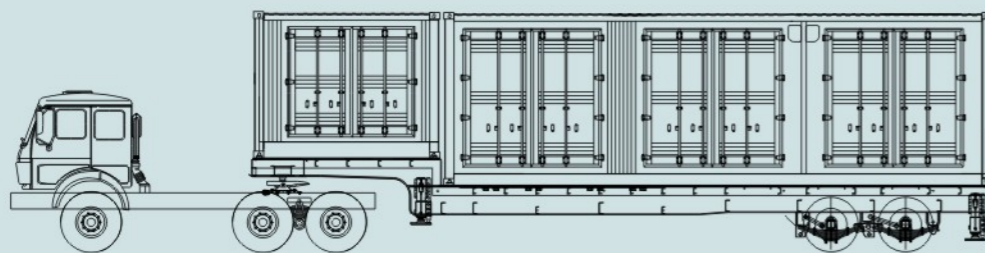


► MEDIUM AND LONG TERM POWER SUPPLY-SOLUTION IV: 132kV(66kV)/40MVA MOBILE SUBSTATION(AIS)

Layout of Transformation Vehicle



Layout of Distribution Vehicle



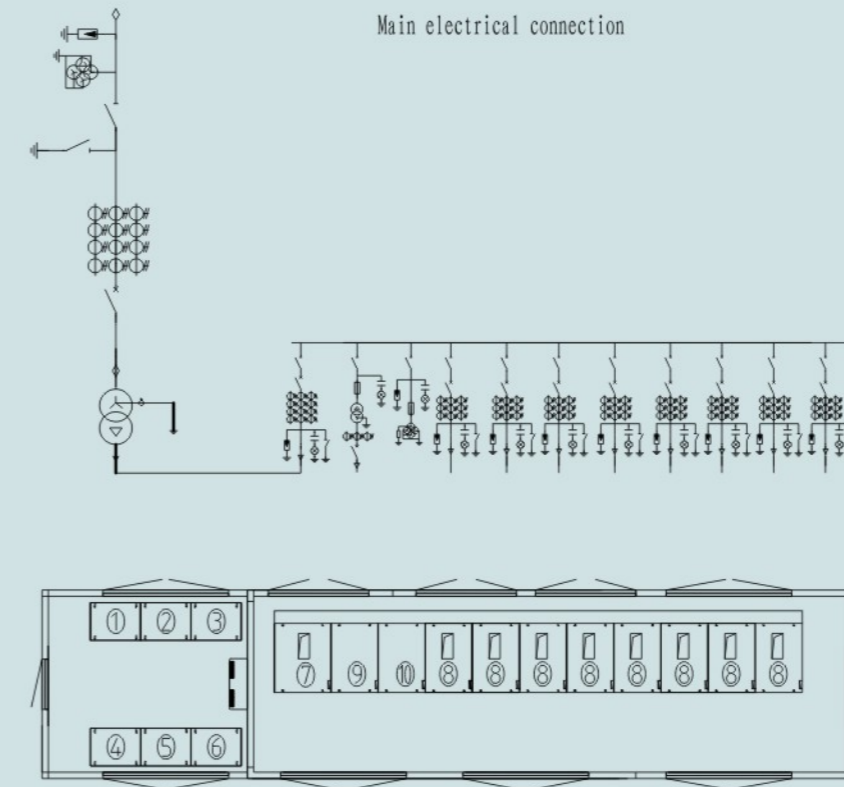
SOLUTION CONFIGURATION

◀ Transformer

- Model: SZ-40000/132kV(66kV)
- Self-cooled transformer is adopted, easy to install and maintain.
- The compact design reduces the boundary dimensions.
- The internal part of transformer is of damping structure.
- The transformer bushing is a compound insulation bushing, which reduces the weight.
- Transformer bushing and iron core are of reinforced design.
- 3D impact recorder is installed.

◀ 132kV(66kV) high voltage switchgear

- High voltage switchgear is characterized with SF₆ insulation, high electrical performance and large safety margin.
- Simple and compact structure stable mechanical properties, low operation noise, easy to install and maintain.



- ① Communication panel
- ② Monitoring panel
- ③ Main transformer protection panel
- ④ Auxiliary system panel
- ⑤ DC panel
- ⑥ Power supply panel
- ⑦ Incoming cabinet
- ⑧ Outgoing cabinet
- ⑨ PT cabinet
- ⑩ Station transformer cabinet

● It is of the integral seal design, waterproof and dampproof, the equipment materials and coating are corrosion resistant and foul resistant. It is suitable for multi-regional and long-time transportation.

◀ 15kV switch cabinet

- 15kV switch cabinet can be box-type fixed switchgear or gas insulated cabinet.
- It has high mechanical strength that can meet the requirement for long distance carriage.
- The quick release cables are used for wiring, and the wiring is flexible.
- Professional maintenance platform is arranged for facilitating the repair and operation maintenance.

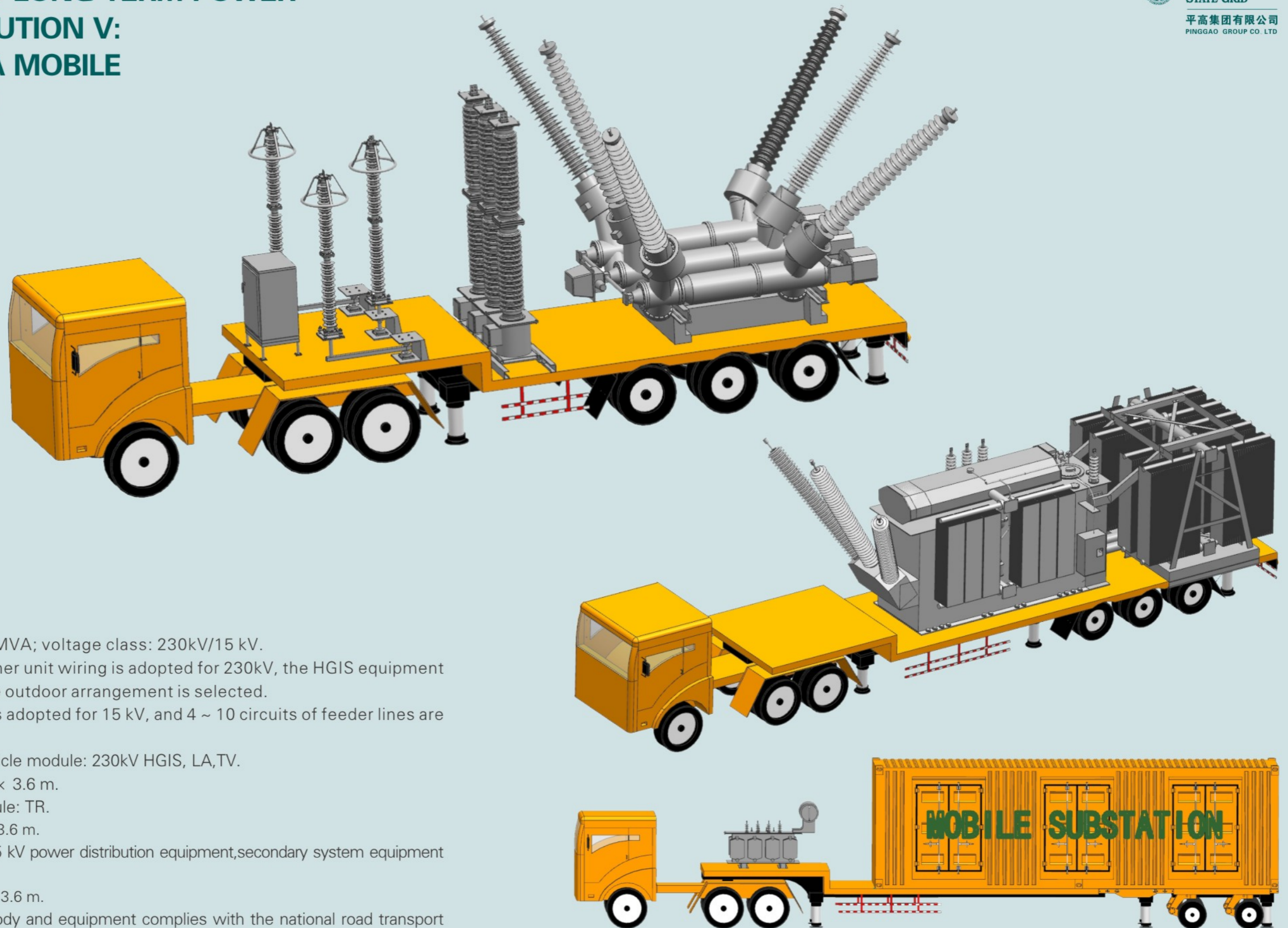
◀ Transport vehicle

- The low slab or high slab transport vehicle can be selected.
- The leaf spring suspension system, hydraulic suspension system or air suspension system can be selected.

◀ Optional accessories

- Motor-driven cable reel
- Working ladder
- Telescopic fence
- Firefighting apparatus
- SF₆ status on-line monitoring system
- Lifting light and video monitoring system
- Oil chromatography on-line monitoring system
- SF₆ filling and deflating device
- Mobile lightning conductor
- Communication and background monitoring system

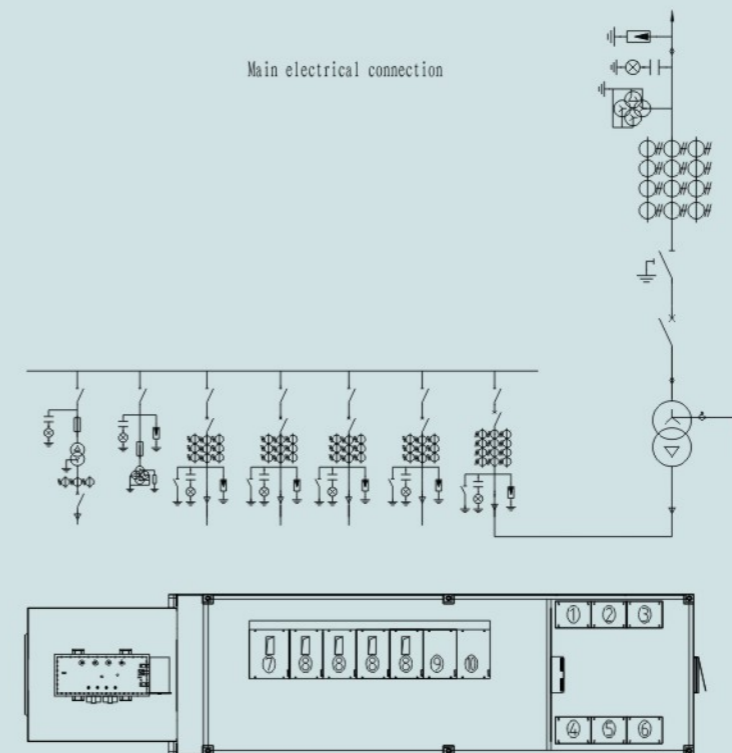
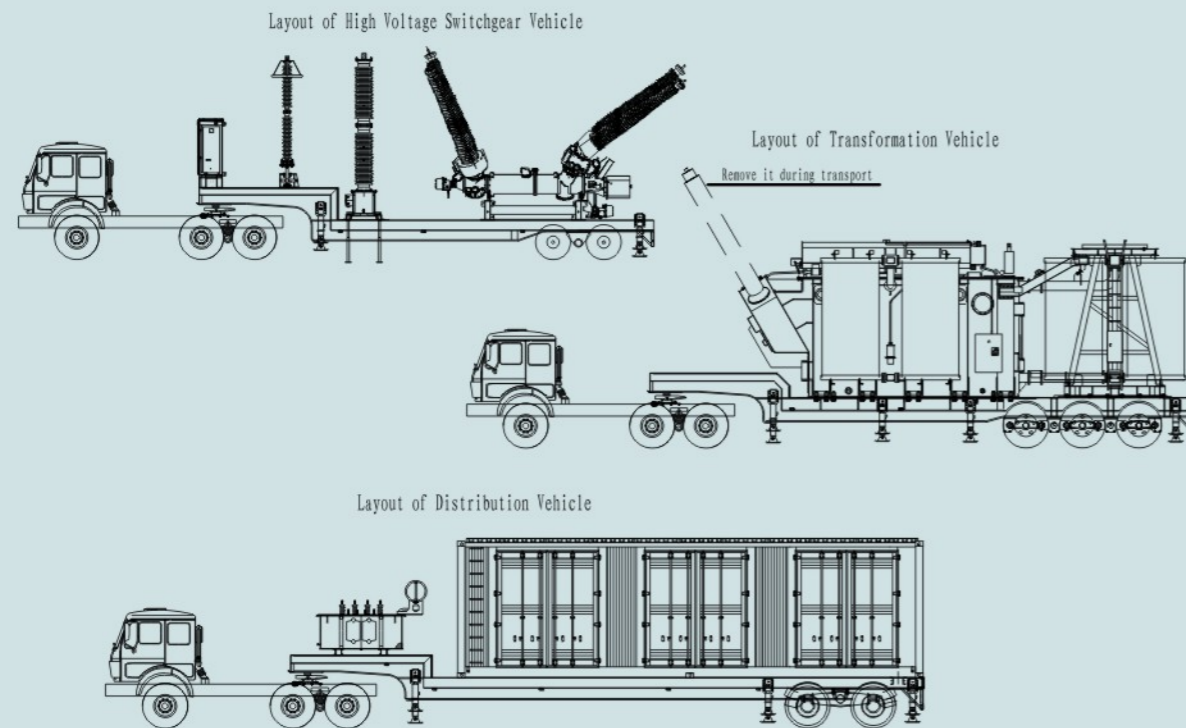
▶ MEDIUM AND LONG TERM POWER SUPPLY-SOLUTION V: 230kV/50MVA MOBILE SUBSTATION



OVERVIEW OF THE SOLUTION

- ◀ Transformer capacity: 50 MVA; voltage class: 230kV/15 kV.
- ◀ Single circuit line transformer unit wiring is adopted for 230kV, the HGIS equipment is selected, and the complete outdoor arrangement is selected.
- ◀ Single-bus configuration is adopted for 15 kV, and 4 ~ 10 circuits of feeder lines are arranged.
- ◀ High voltage switchgear vehicle module: 230kV HGIS, LA,TV.
 - Dimensions (L * W): 11 m × 3.6 m.
- ◀ Transformation vehicle module: TR.
 - Dimensions (L * W): 13m × 3.6 m.
- ◀ Distribution vehicle module: 15 kV power distribution equipment, secondary system equipment and station transformer.
 - Dimensions (L * W): 15 m × 3.6 m.
- ◀ The total height of vehicle body and equipment complies with the national road transport provisions.

MEDIUM AND LONG TERM POWER SUPPLY-SOLUTION V: 230kV/50MVA MOBILE SUBSTATION



- ①Communication panel
- ②Monitoring panel
- ③Main transformer protection panel
- ④Auxiliary system panel
- ⑤DC panel
- ⑥Power supply panel
- ⑦Incoming cabinet
- ⑧Outgoing cabinet
- ⑨PT cabinet
- ⑩Station transformer cabinet

SOLUTION CONFIGURATION

- ◀Transformer
 - Model: SFZ-50000/230
 - Air-cooled transformer is selected to reduce the overall dimensions.
 - The compact design reduces the boundary dimensions.
 - The internal part of transformer is of damping structure.
 - Transformer bushing and iron core are of reinforced design.
 - The transformer bushing is a compound insulation bushing, which reduces the weight.
 - 3D impact recorder is installed.
- ◀230kV high voltage switchgear
 - High voltage switchgear is characterized with SF6 insulation, high electrical performance and large safety margin.
 - It is of the integral seal design, waterproof and dampproof, the equipment materials and coating are corrosion resistant and foul resistant. It is suitable for multi-regional and

long-time transportation.

- The height of support is lowered, the equipment is of miniaturization design, the weight is light, the installation and transportation are convenient.
- Flexible connection mode: optional overhead or cable terminal.
- ◀15 kV switch cabinet
 - 15 kV switch cabinet can be box-type fixed switchgear or gas insulated cabinet.
 - It has high mechanical strength that can meet the requirement for long distance carriage.
 - The quick release cables are used for wiring, and the wiring is flexible.
 - Professional maintenance platform is arranged for facilitating the repair and operation maintenance.

◀Transport vehicle

- The low slab or high slab transport vehicle can be selected.
- The leaf spring suspension system, hydraulic suspension system or air suspension system can be selected.

◀Optional accessories

- Motor-driven cable reel
- Lifting light and video monitoring system
- Working ladder
- Oil chromatography on-line monitoring system
- Telescopic fence
- Communication and background monitoring system
- SF₆ filling and deflating device
- Firefighting apparatus
- Mobile lightning conductor
- SF₆ status on-line monitoring system

MAIN (ACCESSORIES) ANNEX



Motor-driven cable reel



Lifting light and video monitoring system



SF₆ filling and deflating device



Mobile grounding grid



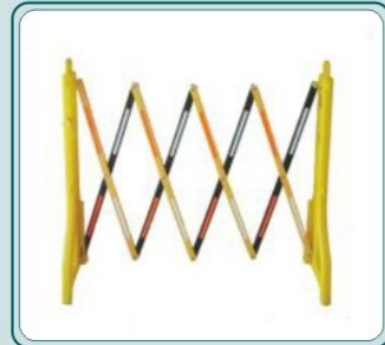
Firefighting equipment



Cable tray



Working ladder



Telescopic fence



Transformer oil chromatography and terminal box



Mobile lightning conductor



3D impact recorder



Grounding copper bar

AFTER-SALES SERVICE NETWORK



- ★ Locations of overseas branches: Poland, India and Laos
- ★ Products network: the products and services of Pinggao are spread over more than 60 countries and regions, with about one thousand substations using the products and services of Pinggao.