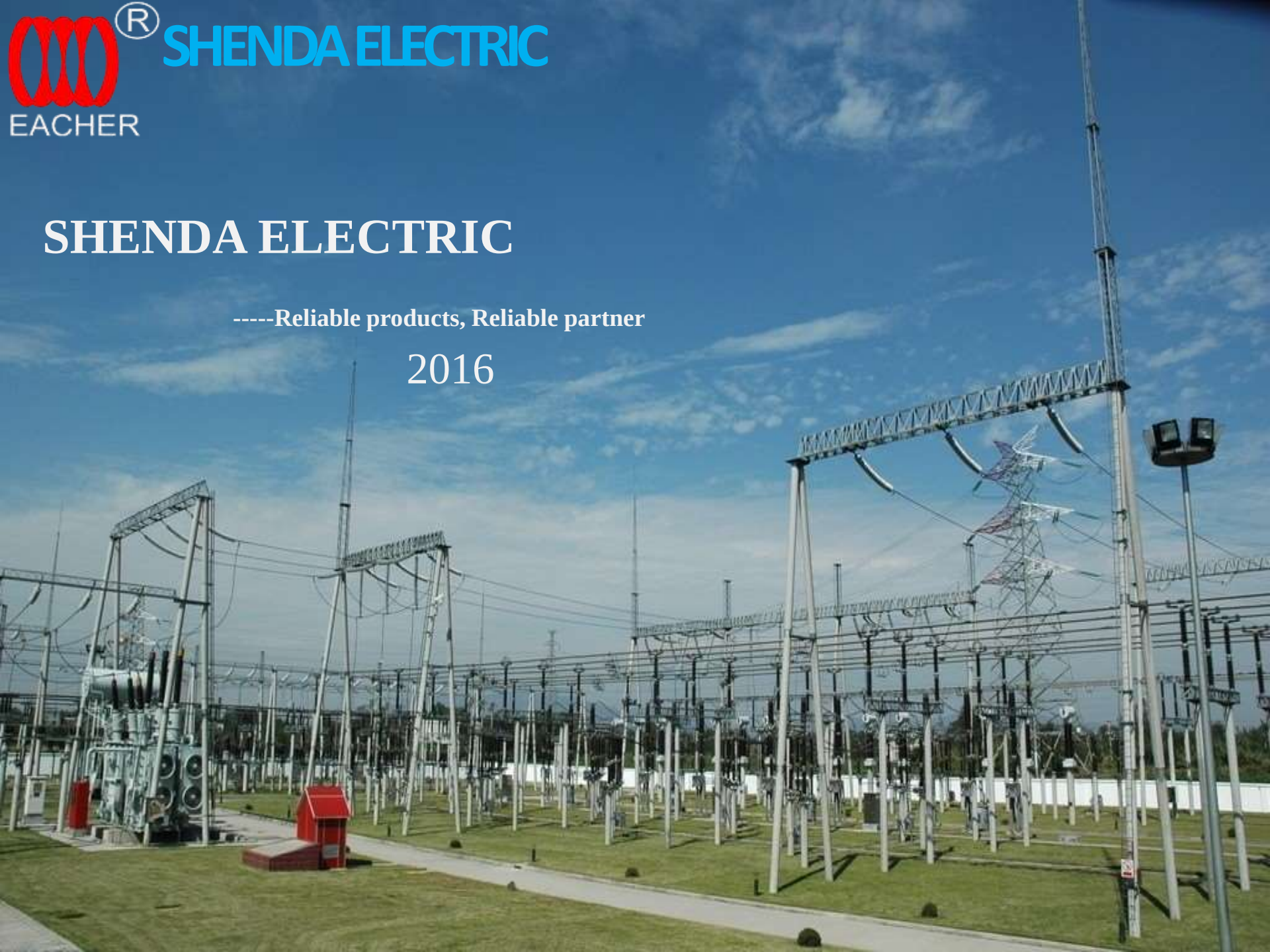


SHENDA ELECTRIC

-----Reliable products, Reliable partner

2016

SHENDA ELECTRIC

EACHER

Content

1 WHO WE ARE-General

We**, SHENDA ELECTRIC** is a professional player in transformer industry, which established in Oct.2000, located in Zhejiang province of China, holds three production factories and ten fully-funded companies.

We always focus on the R&D, have been appointed as a manufacturer of transformers at 330kV levels and below by National Electric Power Corp and Mechanical Industry Union. "EACHER" has been awarded "Famous Brand of Zhejiang Province".

No.	Description	DATA
1	**Name**	**SHENDA ELECTRIC GROUP CO., LTD.**
2	**Brand**	**EACHER**
3	**Location**	**Jiangshan & Jiangling, China & U.S.A**
4	**Year of Establish**	**2000**
5	**Ownership**	**Private ownership company**
6	**Covers area of factory**	**435,000 m^2 (Three factories)**
7	**Building area**	**125,000 m^2 (Three factories)**
8	**Staff**	**Around 1100 (Three factories)**

1-WHO WE ARE-Location &Group

SHENDA ELECTRIC GROUP manages 10 fully-funded companies, with a nationwide product sales and service network. Two factories located in China, one factory located in U.S.A

SHENDA ELECTRIC GROUP

- Jiangshan Shenda electric co., ltd.
- Jingzhou Jiangling Shenda electric co. ltd.
- R.E.UPTEGRAFF MANUFACTURING CO.
- Zhejiang Dry type transformer co.ltd.
- Shenda International Engineering Co., ltd.
- Zhejiang Special transformer co., ltd.
- Jiangshan Shenhui Material Co., ltd.
- Jiangshan heat exchanger Co., ltd.
- Jiangshan Shenda Transportation co., ltd.
- Zhejiang Shenda electrical manufacturing co. ltd.

2-Certificates & Honour

DNV·GL

KEMA INSPECTION REPORT

3208-15

Object	120 MVA Electric Arc Furnace Transformer
Designation	HSSPZ-120000/33 Serial No. CK150834-2
	33,0 / 0,9277 kV – 2099,5 / 74680,6 A - 50 Hz
Client	Shenda Electric Group Co., Ltd., Jiangshan City, China
Manufacturer	Shenda Electric Group Co., Ltd., Jiangshan City, China
Inspected by	KEMA Nederland B.V., Arnhem, The Netherlands

CESI

INSPECTION REPORT CONFIDENTIAL APPROVED

Client	SHENDA ELECTRIC GROUP CO.,LTD No.17, Huatong Road, Jiangshan Economical Development Zone, Zhejiang Province, China
Subject	Witness to type, special and routine tests on Power Transformer Type SZ11-100000/220, Serial Number 120514-1
Place and date of inspection	STRI-CTQC Laboratory, No. 18 Building, Hushitai South Avenue Shenbei New District Shenyang Liaoning Province, P.R. of China From October 10th to October xx, 2012
Order	Agreement (CESI Quotation B40J0084)
Notes	-
N. of pages	4 N. of pages annexed 75
Issue date	September 3rd 2014
Prepared	TCE/CER/PRO Giorgio CRIPPA
Approved	TCE/CER Fiorenzo BREGANI

No.	Description
1	CESI Short Circuit Test Report -100MVA220kV
2	KEMA Test Report - -50MVA/69kV
3	KEMA Test Report --120MVA/33kV
4	CTQC Short Circuit Test Report --63MVA/110kV
5	V-Check --12.5MVA/22kV
6	ISO9001&ISO14001&OHSAS 18001
7	CE

3-Our products

1. 250MVA, 330kV power transformer
2. 180MVA, 220kV furnace transformer
3. 30MVA, 35kV Dry type transformer
4. 100MVA, 220kV rectifier transformer
5. 1600KVA, 20kV Pad-mounted transformer

4 Main Facilities and Equipment-General

4 Main Facilities and Equipment-Oil immersed transformer

4 Main Facilities and Equipment-Dry type transformer

4 Main Facilities and Equipment- H.V TEST

Power frequency Test


1800kV Lightning impulse equipments


Power transformer under test


Test control center

变压器试验微机自动监控系统
Transformer microcomputer automatic test monitoring systems

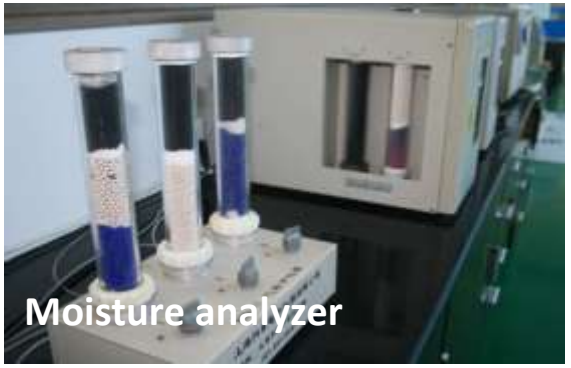

2000KVA Generator

2000kVA发电机组
2000kVA generating set

4 Main Facilities and Equipment- Oil Lab & Control center


Oil break down analyzer

Chromatographic analyzer


Moisture analyzer

OIL LAB


OIL LAB


Control center


Control pannel


Customer witness

4 Main Facilities and Equipment- Witness TEST


Factory Type Test-KEMA-NETHERLANDS


S.C.T Test- CESI-ITALY
CHINA NATIONAL TRANSFORMER QUALITY SUPERVISION AND TEST CENTER


Factory Routine test- SGS-SWITZERLAND


Factory V-CHECK test-KESCO-KOREA

5 TECHNOLOGY-1

More than 50 engineers are working in R&D center, which are come from all over China, most of them with 10+ years experienced in transformer industry.

SHENDA importing the technology of 330kV and below transformers successfully since 2003 , which include design , specifications for manufacturing transformers, instructions for manufacturing transformers, a complete set of technology documents for testing and design calculation software including optimizing design calculation for transformers, calculation of transformer leakage flux and short-circuit mechanical strength, calculation for distribution of transformer leakage flux, calculation of section pie-shaped coils process & pie-shaped coils process, and measurement of coil temperature.

SHENDA has formed its own technology characteristics by absorbing and assimilating advanced technology, the iron adopts the advanced 45o total – oblique connecting seam, upper iron yoke non-folding to reduce the no-load loss; adopt advanced core column tightening device to reduce the noise further; the winding adopt combined lead and transposition lead to reduce the additional loss; calculation accurately the impulse features of electric filed and winding to ensure the excellent electric property and impulse intensity.

All the technology indices are taking the lead in China

Iron core

- High permeability silicon steel sheet of good performance which can reduce noise and no-load loss.
- Iron core adopt the structure of 45° full mitered and no folding iron yoke technology, the forth or sixth joint continuous yoke structure can reduce the no-load current, no-load loss and noise.
- Core leg and yoke are bound mechanically with net-type weftless binding belt and solidified. Particularly, the big plate type clamping piece bounding structure is adopted so that the iron yoke, clamping piece bounding tighten effectively the iron core and reduce the noise.

Winding

The high, medium and low voltage winding as well as high and medium regulating winding are all wound on the hard paperroll. The external sides are all equipped with external supporting rod. As per actual situation, equip complementary supporting rod on the internal sides, so that the anti-short circuit capacity increases.

With single arrangement of medium and high regulating winding, the ampere-turns are distributed comparatively well. All the extruded heads and ends of windings are bound by thermal heat-shrinkable tube or belt to increase the anti-short circuit capacity.

Through the calculation of computer wave process, the winding gradient is distributed reasonably. All the spacers and supporting rods are chamfered according to regulations. Good electrical strength.

The spacers of high, medium and low voltage winding are distributed reasonably according to different grade which is determined according to anti-short circuit capacity, temperature increase, transportation, etc.

5-TECHNOLOGY-3

Coil Assembly

The coil will adopt three times of vacuum drying (each for single coil, integrated phase coil, and active parts) and the entire-phase package process. And adopt special positioning board structure and the control of pressure-sensitive paper in order to ensure the stress applied on each coil is consistent to increase the capability of with standing short-circuit of coil.

The lower iron yoke pad of active parts and upper pressing plate adopt whole insulation structure which has sufficient anti-short-circuit impulse strength.

The pressing structure of active parts is of laminated paper board pressing block instead of traditional pressing nail structure to increase the section area of pressing block and reduce the pressure strength.

The lead connection adopts cold pressure connecting method to prevent the metal foreign substance from entering into the active parts. In addition, all the connection position are shaped, shielded or reduce the partial discharge and enhance the operating reliability of transformer.

Tank

The product of 110kV-330kV adopt vacuum oil tank. The upper and lower oil tank is welded together to form one body. The casing is not required to be lifted at site and the main body is free of maintenance.

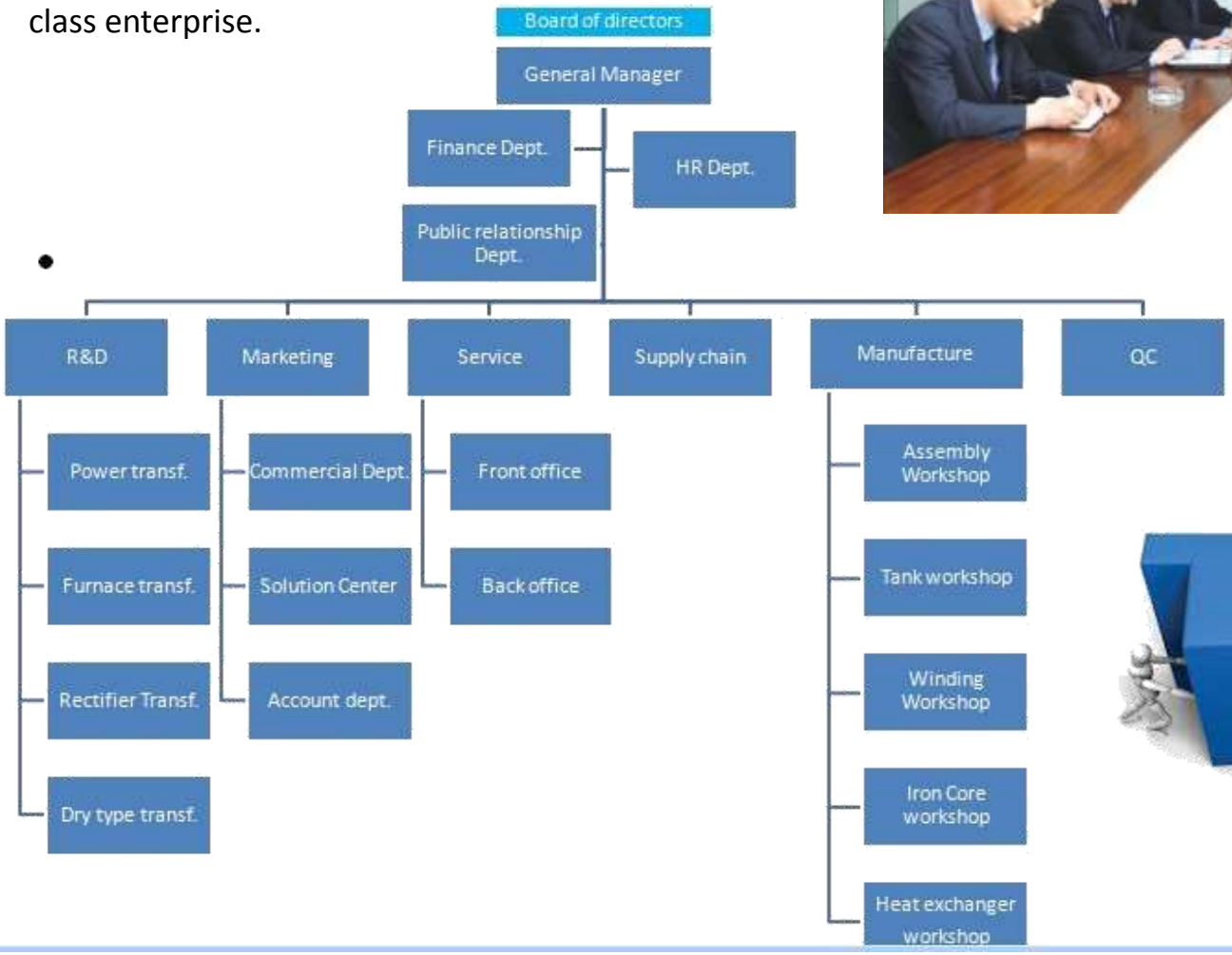
The oil conservator adopts air-sac type with oil level indicator to meet the requirement of filing. Transformer oil is injected into the tank under full vacuum after the accessories of transformer are mounted. So that the air bubble will not formed in the insulated parts in the transformer and the partial discharge will be reduced.

The general assembly adopts Toshiba technique in all aspects. The active parts is under equivalent exposure duration control from the finishing drying of main body to vacuum oil injection

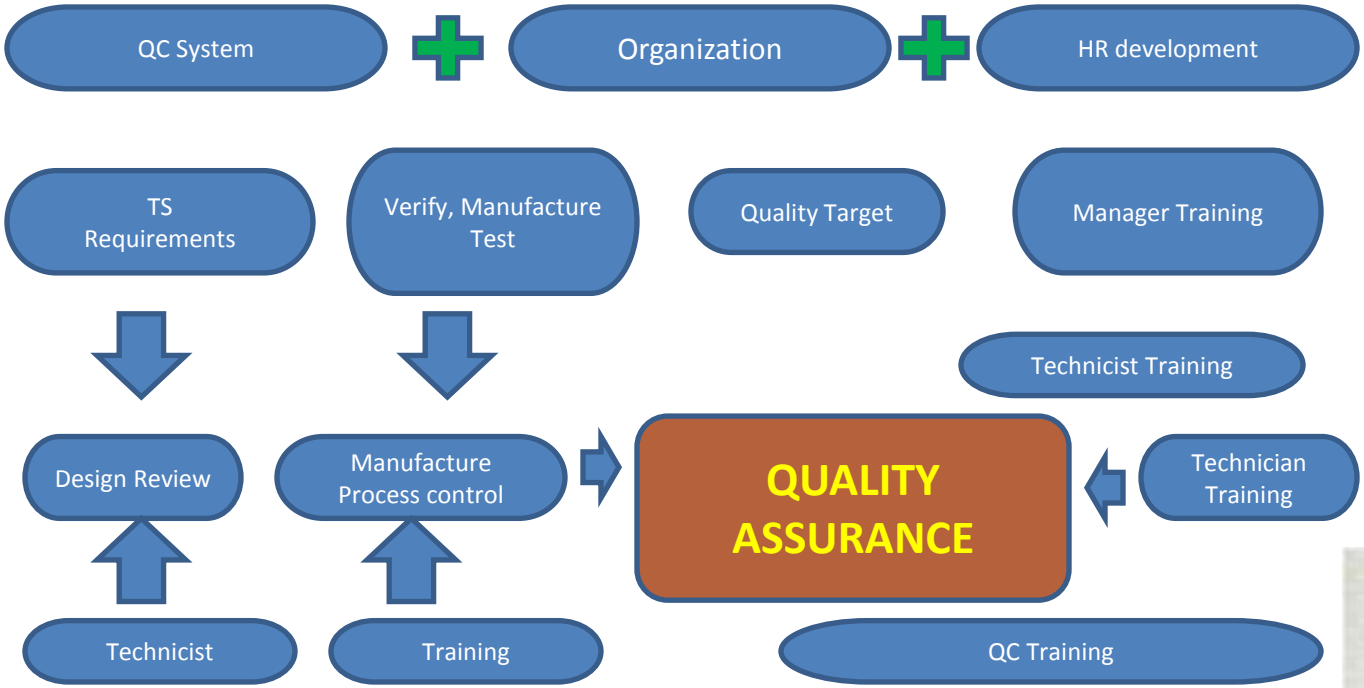
6-MANAGEMENT- HR

SHENDA is a private company under the management team according to Modern enterprise system. It has complete corporate governance structure.

It takes the market as its direction and management and innovation as new Motivation to build itself into a first class enterprise.



6-MANAGEMENT- QC



Quality Management System : ISO 9001:2008

First of all, there is the fulfillment of the quality claim to
Which we have committed ourselves without compromises.
Every workshop manufacturing SHENDA transformers' parts
Put our quality management system according to ISO 9001:2008
Into practice. And only those transformers that have successfully
Passed all the comprehensive tests will then go
Into practical application.

6-MANAGEMENT-Environment & Measurement& Credit

Environmental Management system

In accordance with the requirements of ISO14001:2004,We have established and maintained the company environmental management system.


UCS

UNIVERSAL CERTIFICATION SERVICE CO.,LTD.

ENVIRONMENTAL MANAGEMENT SYSTEM CERTIFICATE

SHENDA ELECTRIC GROUP CO.,LTD.

GB/T24001-2004 idt ISO14001 : 2004

DESIGN AND MANUFACTURE OF 220KV AND BELOW & 150000KVA AND BELOW POWER TRANSFORMER; 35KV AND BELOW COMBINATION TRANSFORMER; 35KV AND BELOW SG(B) AND SC(B) SERIES DRY TYPE TRANSFORMER; 110KV AND BELOW FURNACE SERIES TRANSFORMER; 110KV AND BELOW RECTIFIER SERIES TRANSFORMER OF MANAGEMENT

CNAS

IAF

Measurement management system

SHENDA has established its own measurement testing guarantee system as per national standard of GB/T 19022-2003(ISO 10012:2003).

Credit management system

SHENDA has established its own Credit system successfully.

National High-Tech Enterprise


Dormitory

7-Enterprice culture

SHENDA's Responsibility

Forge ahead industriously and innovate independently;
Form its own characteristics by adopting others' advantages;
Create first class products for world's electric power

8 OUR MARKETING-General

SHENDA Transformers:
In operation all over the planet

SHENDA is a worldwide partner for all power applications and industrial companies-Accordingly, the examples of our work are Global: Whether in South America, Asia or Europe, Whether in the desert or in specially demanding Applications. Thousands of plants run efficiently and reliably with our technology.

When will we have the opportunity to present your project here?

8 OUR MARKETING- Customers visit-1

8 OUR MARKETING- Customers visit -2

8 Power transformer -Asia


180MVA/220kV-CHINA STEEL PLANT


100MVA/220kV-CTQC S.C.T TEST
Witnessed by: CESI-Italy

8 Power transformer -Asia

8 Power transformer-Asia


42MVA/150kV --Indonesia


12.5MVA/69kV mobile substation--Philippines


50MVA/132kV --IRAN


100MVA/220kV--Jordan

8 Power transformer –Latin America


60MVA/220kV -Peru


30MVA/66kV -Paraguay


1.5MVA/23kV - Chile


14MVA/69kV -Dominica

8 Tansformers - Africa

8 Power transformer & Distribution transformer - Europe

8 EAF &LF transformer & Reactor 1

8 EAF &LF transformer & Reactor 2

8 EAF & LF transformer & Reactor 3

8 Submerged Arc Furnace transformer 1

8MVA/110kV Single phase Arc furnace transformer-China

11MVA/110kV Single phase Arc furnace transformer-China

600kVA/6.6kV Submerged Arc furnace transformer-POSCO-KOREA

8 Rectifier transformer


2.5MVA/11kV Rectifier transformer-For Induction furnace – ABP - Germany


3810VA/10kV Rectifier transformer- Induction furnace- Inductotherm Group -USA


12.5MVA/11kV Rectifier transformer-F Induction furnace –POSCO-Korea


6MVA/66kV Rectifier transformer- BHP Billiton -Australia

8 Traction transformer for Railway

8 Dry type transformer-1


5MVA Dry type transformer-Canada


Dry type transformer-Singapore


10MVA Dry type transformer-Canada


5MVA Dry type transformer-India

8 Dry type transformer -2


125kVA Dry type transformer-Australia


630kVA Dry type transformer-Ukraine


2.5MVA Dry type transformer-Burma


50kVA Dry type transformer-Guatemala


2MVA Dry type transformer-New Zealand

9 Our commitment-QUALITY GUARANTEE

QUALITY GUARANTEE

"QUALITY IS UPPERMOST"

Adopting such advanced technology in design, manufacture and quality control the company does not use a lift cover when installing a product on the site and the main body of the products is free from maintenance for 20years
Qualified products meeting design specification will be provide in accordance with the contract strictly.
Strict inspection and control over raw materials , device components and accessories are carried out upon receiving them.
Satisfactory process for equipment provided and complete inspection measures are guaranteed. Products with defects shall never be sold.
The company shall be liable for obligations related to subcontractors in terms of such aspects as products supply , quality, equipment specified cautions technology for interface and service.
Immediate notification of quality defects occurring in the process of the manufacturing should be made to the parties concerned and no concealing shall be made. In case the defect of the equipment is not tolerated by the standard stipulated in the contract, the supplier shall promptly negotiate with the customer to reach a solution, If any quality problem arises during installation and trail operation of the equipment, the principle of dealing with the problem before deciding which party shall assume the obligations shall be implemented.

9 Our commitment-SERVICE Commitments

According to the time required by the customer, on site technology service shall be carried out, instructing the customer to install, test and operate in accordance with the technology materials and drawings supplied by the supplier.
People providing services shall be responsible for the correctness of related advice and matters concerning the field of their operation.
The supplier shall offer to provide the technical conditions and materials meeting the interfaces of the equipment needed by the customer, which is part of the complete equipment.
Intensify pre-sale service, in-sale service and post-sale service. Implement the principle of “24 hour service, service in advance, service in the whole course, life long service” in the manufacture, installation, adjustment and major troubleshooting of the product.
Upon receipt of complaint about the quality of the product, response shall be made or service staff shall be dispatched within 24 hours; in case of emergency, service staff shall be on the spot as soon as possible. Service will never stop until the customer is satisfied with the product quality.
Spare parts are available to the customer any time.


Transformer Installation


Service team in Philippines


Preventive maintenance

SHENDA ELECTRIC

EACHER

Thanks

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