Brief Introduction of Power EPC Business

To Safely and Effectively Deliver Every Project
## CONTENTS

<table>
<thead>
<tr>
<th>Chapter</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>About Chint Power Engineering</td>
<td>01</td>
</tr>
<tr>
<td>About Chint Group</td>
<td>02</td>
</tr>
<tr>
<td>Chint Group Global Business Operation</td>
<td>03</td>
</tr>
<tr>
<td><strong>Services</strong></td>
<td></td>
</tr>
<tr>
<td>Engineering</td>
<td>05</td>
</tr>
<tr>
<td>Procurement &amp; Manufacturing</td>
<td>07</td>
</tr>
<tr>
<td>Construction</td>
<td>11</td>
</tr>
<tr>
<td><strong>Markets</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Track Records</strong></td>
<td></td>
</tr>
<tr>
<td>Power Transmission &amp; Distribution Projects</td>
<td>13</td>
</tr>
<tr>
<td>Power Generation Projects</td>
<td>15</td>
</tr>
<tr>
<td>Oil, Gas &amp; Chemical Industry Projects</td>
<td>16</td>
</tr>
<tr>
<td>Mining &amp; Metallurgy Industry Projects</td>
<td>17</td>
</tr>
<tr>
<td>Civil Infrastructure Industry Projects</td>
<td>18</td>
</tr>
<tr>
<td>More Projects</td>
<td>19</td>
</tr>
<tr>
<td><strong>Quality Assurance</strong></td>
<td>20</td>
</tr>
</tbody>
</table>
Chint Power Engineering is the department of Chint Power T&D to provide EPC services for substation, transmission line & power generation projects through the processes of designing, supply, construction, installation, testing and commissioning. Chint Power T&D is a business unit of Chint Group which is a leading player in the electric industry. Besides of providing EPC services, Chint T&D offers safe, reliable and efficient power transmission & distribution equipments as well with a global presentation in over 110 countries. Chint T&D possesses 5 manufacturing business units and owns one of the world’s largest power T&D manufacturing facilities with manufactory area of 900,000m² located in Shanghai and over 4300 employees. The Revenue of Chint T&D in 2011 is 660 million USD.

The manufacturing knowledge of Chint T&D and Chint Group enables Chint Power Engineering to stand out from the other Power EPC companies. Chint manufactures the complete range of equipments for high voltage power transmission & distribution, low voltage distribution electrical and solar energy. With this easy access to Chint Group’s manufacturing knowledge and expertise, Chint Engineering strives to offer our customers with the most economical, environmentally friendly, well performed and socially acceptable solution.

Up to now, Chint Engineering has already successfully executed a number of projects globally in China, Yemen, Tanzania, D.R. Congo, Angola, Nepal, Vietnam, Myanmar, Pakistan, Cambodia, etc.
Founded in July of 1984, Chint Group has grown into a global company which encompasses nine subsidiaries with over 25,000 employees around the world. Its expansive business has reached across the entire electrical industry.

**Business**: High voltage power transmission & distribution, low voltage distribution electrical, solar energy industry, instruments and meters, construction Electrics, automotive electrics and industrial automation

**Markets**: More than 110 countries/regions worldwide

**Employees**: 25,000

**Headquarters**: Wenzhou, China
Chint Group Global Business Operation

Chint Power Engineering Overseas Branches
- Chint Power Engineering Pakistan Office
- Chint Power Engineering Tanzania Office
- Chint Power Engineering Nepal Office
- Chint Power Engineering Yemen Office

Chint Group Overseas Branches
- Chint Electrics Holding Ltd., Australia
- PT Chint Indonesia
- CHINT New Zealand Ltd.
- CHINT Group s.r.o., Czech
- Chint Electrics S.L., Spain
- Chint Turkey
- Chint Europe(UK) Ltd.
- Chint Poland Sp. z o.o.

Chint Group
A Clean Energy Developer and Energy Efficiency Management Supplier
A Heavyweight in the Electrical Industry
Global Operation in over 110 Countries
Engineering

Proven Expertise and Experience to Offer the Most Economical, Environmentally Friendly, Well Performed and Socially Acceptable Solution

With experienced multi-disciplinary design engineers, streamlined engineering process from concept to completion and technologically advanced engineering methods, we produce and advise our customers optimal designs that can reduce cost and increase reliability. We apply advanced technology. We innovate and pursue excellence.

Engineering Scope

- Concept & basic design drawing
- System configuration
- Current transformer/ Voltage transformer calculation
- AC/DC capacity calculation
- AC/DC circuit design
- Earthing system calculation & plan
- Lightning protection calculation
- Cable calculation
- Short circuit current calculation
- Short circuit force calculation
- Protection relay setting calculation
- Cable block diagram & schedule
- Steel gantry structure calculation
- Steel support structure calculation
- Installation drawing design
- Civil foundation design
- Construction drawing design
- Installation and operation maintenance manual
- Site inspection and testing procedure manual
- As built document
Optimum Solution Proposal

Site Survey
- Site selection
- Interface structure determination
- Connected equipment investigation

Conceptual Design
- Insulation coordination
- Current transformer calculation
- Battery calculation
- Cable size calculation

Economic Evaluation
- Capacity estimate
- AIS/GIS type selection (comparison & analysis)
- System efficiency improvement

System Analysis
- Stability analysis
- Harmonic analysis
- Voltage drop analysis
- System surge analysis

Detailed Designing Process

Project LOA Receipt

Contract Document Inspection
- Study of lightning/switching surge
- Study of insulation coordination

Engineering Schedule
- Schedule detail organization
- Resource arrangement

Outsourcing & Manufacturing

Approval Document

Engineering
- Grounding calculation
- Conductor sizing calculation
- Current transformer calculation
- Steel structure calculation
- Battery/charger calculation
- Cable sizing calculation
- Cable support calculation
- Installation drawing
- Foundation drawing
- Building drawing

Equipment Inspection
- Testing
- Acceptance Check

As-Built Drawing
Procurement & Manufacturing

Chint manufactures power transmission & distribution equipments such as power transformers, GIS, HV SF6 circuit breakers and disconnectors, VCBs, MV/LV switchgear panels, surge arrester & insulators, CT & PT, cable & wire, capacitors, power protection & automation equipments and prefabricated substations; solar energy products such as PV cells, PV modules, thin films, inverters, monitoring system; low voltage distribution electrical products such as MCBs, MCCBs, ACBs, contactors, fuses, etc. Our products have been widely used in diversified industries around the world.
Based on our manufacturing capabilities, we also outsource the required materials and services through our long-term strategic partners and global network at a competitive price. Our partnerships enable us to find the optimal materials and services which better suit our customer’s needs and with good quality as well as to find an optimal logistics solution that is cost effective.
Power Transmission & Distribution Product Portfolio

- Power transformer up to 765kV
- Distribution transformer up to 35 kV
- Dry-type transformer up to 35 kV
- GIS up to 252kV
- HV circuit breaker & switch disconnector up to 252kV
- VCB 12—40.5kV
- MV/LV switchgear panel up to 40.5kV
- Surge arrester & Insulator up to 500 kV
- CT & PT up to 230 kV
- Power distribution automation system
- Cable up to 36 kV
- Capacitor & capacitor bank
- Prefabricated substation up to 40.5kV
Low Voltage Distribution Electrical Product Portfolio

- Modular din-rail product
- MCCB
- ACB
- Contactor
- Over-load relay
- Starter
- Pushbutton
- Inverter, soft-starter
- Relay
- Capacitor
- Transformer
- Automatic voltage regulator
- Switch disconnecter

Solar Energy Product Portfolio

- Monocrystalline PV cell & module
- Polycrystalline PV cell & module
- Thin film PV module
- Inverter up to 500kW
- Monitoring system
- Config Program
- Accessory

>>>
Construction

The construction capability of Chint Power Engineering supports its mission to safely and effectively deliver every turnkey project at a great extent. This capability lies in its global business network, global construction partner resources and extensive experience with local culture, regulations and laws. Safety and the minimum impact to the environment and the social is No. 1 rule that every one follows throughout the whole process.
Chint Power Engineering focuses on providing EPC services for substations & transmission lines up to 500kV, new energy & conventional energy power plants, power supply systems of oil, gas & chemical industry, mining & metallurgy industry and commercial & civil construction industry.

**Power Transmission & Distribution**
- Power Grid & Distribution Substation up to 500kV
- Power Transmission & Distribution Line up to 500kV

**New Energy Power Generation**
- Solar Power Station
- Wind Power Station
- Biomass Power Plant

**Conventional Energy Power Generation**
- Coal-fired Power Station
- Gas turbine Power Station
- Diesel Power Station

**Oil, Gas & Chemical Industry**
- Total Step-down Substation
- Workshop Distribution Substation
- Rooftop Solar Power Generation
- Cable Project

**Mining & Metallurgy Industry**
- Total Step-down Substation
- Workshop Distribution Substation
- Mobile Substation
- Underground Substation
- Power Transmission & Distribution Line
- Cable Project
- Rooftop Solar Power Generation

**Civil Infrastructure Industry**
- Underground Substation
- Prefabricated Landscape Substation
- Rooftop Solar Power Generation
- Cable Project
Power Transmission & Distribution Projects

1. 220kV Rohri Substation, Pakistan
2. 220kV SMCO Substation, D.R.Congo
3. 220kV SMCO-RC Transmission Line, D.R.Congo
4. 220kV Arusha Substation, Tanzania
5. 220kV Mbeya Substation, Tanzania
1 220kV Dodoma Substation, Tanzania
2 220kV Singida Substation, Tanzania
3 33kV Tanga Substation, Tanzania
4 33kV TOL Substation, Tanzania
Power Generation Projects

1. 100MW Ningxia Shizuishan Solar Power Plant, China
2. 20MW Tibet Golmud Solar Power Plant, China
3. 110kV Step-up Substation, 100MW Jiangsu Huadian Guanyun Wind Power Plant, China
4. 110kV Step-up Station, Handan Cheng'an Straw Thermal Power Plant, China
5. 220kV Step-up Switchyard, Heilongjiang Longmei Gangue Thermal Power Plant, China
Oil, Gas & Chemical Industry Projects

1. 110kV Mudanjiaog Rida Chemical Transmission Line, China
2. 110kV Mudanjiaog Rida Chemical Substation, China
3. 35kV Saint Gobain Mudanjiaog Substation, China
4. 10kV Distribution Station, SINOPEC Shengli Oilfield, China
5. 10kV Distribution Station, CNPC Daqing Oilfield, China
Mining & Metallurgy Industry Projects

1. 110kV Yunnan Mining GIS Substation, China
2. 110kV Hainan Steel Substation, China
3. 110kV Yunnan Haolong Clyuan Cement Plant Substation, China
4. 33kV HIPC Steel Substation, Yemen
5. 35kV Anping Cement Plant Substation, Vietnam
Civil Infrastructure Industry Projects

1. 10kV & LV Distribution Station, Shanghai World Expo 2010, China
2. 10kV Distribution Station, Beijing Olympic Games 2008, China
3. 10kV & LV Distribution Stations, National Hospital & National Health Center, Angola
4. 10kV Distribution Station, Beijing Capital International Airport, China
More Projects

- 220/132/33kV Mabuki Substation, Tanzania
- 220kV Shikapur Substation, Pakistan
- 132kV Kamoki Power Plant, Pakistan
- 132kV Suq Abs Substation, Yemen
- 132kV Bajil Substation, Yemen
- 132kV Yarim Substation, Yemen
- 132kV Dhamar Substation, Yemen
- 33kV Baniyani Substation, Nepal
- 33kV Mirchaila Substation, Nepal
- 33kV Dhanushadham Substation, Nepal
- 33kV Paraul Substation, Nepal
- 33kV Dhanushadham Substation, Nepal
- Inner Mongolia Xilinhaote Dongwu 220kV Substation, China
- Inner Mongolia Baotou Zhaomiao 220kV Substation, China
- Inner Mongolia Huatai Motor Company 110kV Substation, China
- Yunnan Bainlu Mining 110kV Substation, China
- Henan Dengfeng Nandan 110kV Substation, China
- Yunnan Mengzi Yanzi Mining 110kV Substation, China
- Heilongjiang Qiqihar Hua’an Plant 110kV Substation, China
- Shanxi Electric Power Group 110kV Substation, China
- Shangxi North Lin County 110kV Substation & Transmission Line, China
- Heilong Halbao Cement Plant 110kV Substation, China
- Lanzhou Fangda Carbon Company 110kV Substation, China
- Bijie Donghua 110kV Substation, China
- Heilongjiang chemical plant 110kV Substation, China

>>>
Quality Assurance

Chint Power T&D sets up its quality management system under ISO9001 and applies it throughout the production and management process. Chint also cooperates with top international laboratories for its product evaluation, such as KEMA, CESI, PCT (GOST) and TUV. The quality policy of Chint T&D is to create a world-famous brand and to lastingly provide the satisfied products and solutions for customers. Chint Power Engineering fully advocates the quality management system and policies in its EPC activities.