

**A PRESENTATION OF
BAODING TIANWEI BAOBIAN
ELECTRIC CO., LTD.**

2222 TIANWEI WEST ROAD

BAODING 071056, HEBEI

CHINA

2007



BAODING TIANWEI BAOBIAN ELECTRIC CO., LTD.
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Baoding Tianwei Group Co., Ltd
&
Baoding Tianwei Baobian Electric Co., Ltd.



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- **HISTORY:** Baoding Transformer Work which was founded in 1958, predecessor of Baoding Tianwei Group Co., Ltd., is one of 100 pilot enterprises of the State Council for establishing the modern-enterprise system. Approved by National Development and Reform Commission and Hebei Provincial Government, Baoding Transformer Factory was restructured to become an enterprise group authorized by the state to manage the state-owned assets in June 1995. After Baoding Tianwei Baobian Electric Co., Ltd. was founded in Sep, 1999, it was certified to meet the standards of high and new technology enterprise. It achieved the Double High-Tech Certification by the Ministry of Science and Technology and Chinese Academy of Sciences at the end of the same year. **On January 12 2001, Baoding Tianwei Baobian Electric Co., Ltd. was listed as the name of “Tianwei Baobian” at Shanghai Stock Exchange, and issued 60 million shares of Stock A by means of network pricing, raising fund of RMB 0.52 billion.**

Tianwei Baobian successively established the following subsidiaries:

- Beijing Tianwei Ruiheng Electric Co., Ltd. specializing in manufacturing dry type current transformers and dry type bushing;
 - Baoding Tianwei Instrument Transformer Company specializing in manufacturing CT and PT;
 - Baoding Yingli New Energy Resources Co., Ltd. specializing in manufacturing polysilicon solar batteries;
 - Tianwei Xinyu Science and Technology Development Co., Ltd on the basis of information technology development and developing online monitoring devices for transformers as its representative products.
- The whole area of Baoding Tianwei Baobian Electric Co., Ltd. (located in Baoding, China) is about 660,000 square meters (7,100,000 square feet) There are totally 1772 employees, among which more than 600 employees are in charge of science and technology management; two engineering PHDs, and twenty-seven masters in engineering.

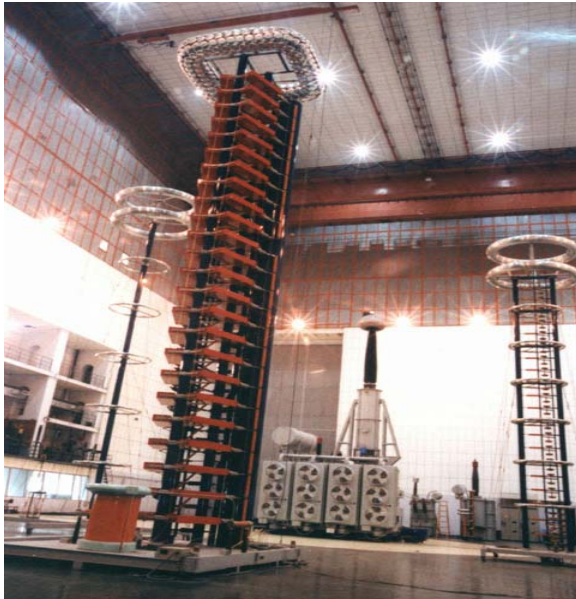


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- Baoding Tianwei Baobian Electric Co., Ltd. has built a sealed 1000kV voltage level product assembly work shop for “Double Million” products and the biggest Ultra High Voltage laboratory in China. In accordance with the designed capacity, Baoding Tianwei Baobian Electric Co., Ltd. can manufacture super large transformers with capacity of

1200MVA and the voltage level of 1000kV for single unit in this workshop. The company installed facilities for the load capacity of 2×400 tons in this very large assembly workshop to meet the production capacity of 1000kV and 1000MVA transformers, and the Ultra High Voltage laboratory with total area of 3750 square meters(40,400 square feet) is also equipped with advanced equipment and testing instruments.

- Tianwei Baobian (Qinhuangdao) Transformer Co., Ltd.is located in Shanhaiguan Distric, Qinhuangdao City, China with total area of 160,000 square meters (1,730,000 square feet), The Company has also built a large assembly workshop with the load capacity of 2×400 tons and a Ultra High Voltage laboratory for “Double





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Million” products, all of the facilities went operational in Oct. 2005. The focus of this company is on manufacturing 500MVA (single unit capacity) and above Ultra High Voltage Transformers, High Voltage DC Transformers, Smoothing Shunt Reactors, and large exports products, etc.

- Tianwei Baobian (Hefei) Transformer Co., Ltd. is located in Luyang Industry



Zone, Hefei, with total area of 300,000 square meters (3,230,000 square feet). For its first phase, it was installed with a 500kV voltage level assembly workshop and an Ultra High Voltage Laboratory, with lifting capacity 2*200 tons. Went operational in Jan. 2006. It focuses on manufacturing

450MVA (single unit capacity) and below capacitance power transformers with voltages covering 500kV, 220kV, 110kV and 35kV. Its annual output is planned to reach 20000MVA.

- After Tianwei Baobian (Qinhuangdao) Transformer Co., Ltd. and Tianwei Baobian (Hefei) Transformer Co., Ltd. were put into operation, **Baoding Tianwei Baobian Electric Co., Ltd becomes China’s biggest large power transformer manufacture base, whose total annual output would exceed 85000MVA.** This will be a solid foundation for the further development of the company.
- Since 1958 when the transformer factory was founded, the technology of the company has made great strides: (Chart One)
 - In 1960, manufactured 10kV transformers;
 - In 1964, manufactured 35kV transformers;
 - In 1966, carried out pilot manufacturing of 110kV



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transformers;

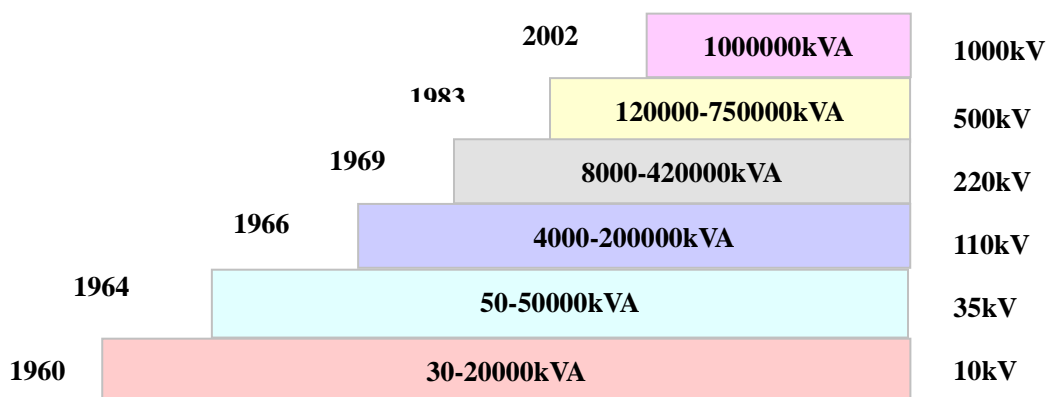
- In 1969, carried out pilot manufacturing of 220kV transformers;
- 1983, manufactured 500kV transformers;
- 2002, manufactured 1050kV transformers, with the highest voltage level transformer in domestic market today.

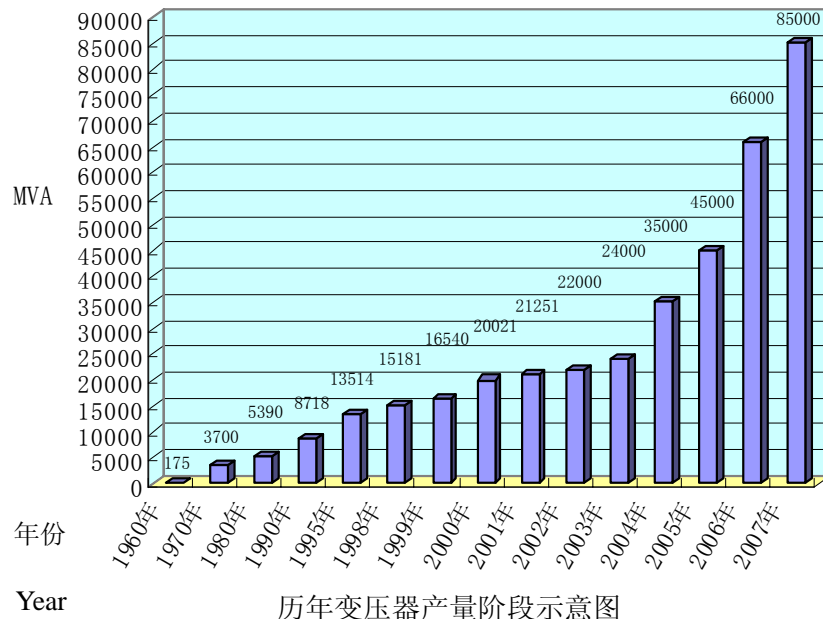
Up to now, Baoding Tianwei Baobian Electric Co., Ltd. has manufactured more than 300 main transformers for matching the generating units which is below 300MW; more than 200 main transformers for matching 300MW generating units; more than 260 main transformers for matching 500-1000MW generating units; and at the same time accordingly, more than 500 units of all kinds of split transformers used as Start-up and Standby Transformers and Auxiliary Transformer.

Up to now, Baoding Tianwei 500kV transformers still boast the glory of zero accident rates. Total number of 500kV products has reached 1400 units/year. Many technologies of the 500 kV transformers manufactured by our company have filled domestic technical needs and won the Prize of State Key Technology and Equipment Excellent Project Awards, awarded by State Key Technology and Equipment Office of the State Council.

At present, Tianwei Baobian Electric Co., Ltd has been placed by the national Ministry of Power Industry into Recommended Manufacturer List as a recommended manufacture of accessory equipment for the generating units with capacity from 50MW to 600MW

Chart One the Development of Transformer Voltage Level and Capacity





Historical Annual Output Development

(Special note: Output in 2008 is estimated to 85000MVA)

- Baoding Tianwei Baobian Electric Co., Ltd has also carried out large quantities of research and studies for the 3D electric field value calculation of the 500kV HV Lead and electrolyzer simulation tests:
 - Flux distribution of 500kV single-phase autotransformer under no-load over-excitation;
 - Analysis and calculation of the transformer temperature field and oil velocity field;
 - Analysis and measurement technologies of transformer winding thermal point temperature;
 - Leakage magnetic field problem of transformer. On account of the leakage magnetic field analysis, Baobian first applies the magnetic shield to the large transformers creating the first
 - Practice of magnetic shield applied technique and overcoming the problem of partial discharge.

- Tianwei Baobian also introduced and learned foreign advanced



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technologies and management experience from **Toshiba, Hitachi, Mitsubishi and Siemens, etc.** By more than ten years of research and continuous improvement, Baoding Tianwei Baobian Electric Co., Ltd. companies have achieved a large quantity of science research results in the applied techniques of electricity, magnetic, thermology, mechanics, etc. of transformer manufacturing engineering.

- In 1996, our company was certified to GB/T19001-ISO9001 quality system certification by China Mechanical Industry Quality System Certification Center;
- In 2004, our company was certified to GB/T24001-ISO14001 Series Environment Management System Certification and GB/T28001 series occupational health and safety management certification by China United Certification Center. **After certification to the Quality System Certification of Qinshan Nuclear Power Plant Phase I, Phase II, Phase III and Phase IV, Baoding Tianwei Baobian Electric Co., Ltd became the qualified supplier for Daya Bay Nuclear Power Plant. Baoding Tianwei Baobian Electric Co., Ltd is the only one supplier, which has gained the quality assurance systems certifications for both nuclear power plants in China**
- In May 1999, Baoding Tianwei Baobian Electric Co., Ltd achieved Production Capability Certification by South Africa Bureau of Standards (SABS).
- In 2005, Baoding Tianwei Baobian Electric Co., Ltd achieved the **CERTIFICATION FOR THE EXEMPTION OF IMPORT AND EXPORT COMMODITIES FROM INSPECTION** by General Administration of Quality Supervision and Inspection and Quarantine of the People's Republic of China. Up to now, Baoding Tianwei Baobian Electric Co., Ltd is the unique manufacturer to gain this laurel in China transformer



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industry.

- The Safety/Environment Management Policy of Baoding Tianwei Baobian Electric Co., Ltd is: Abiding by Laws and Regulations, Safely Producing, Managing Scientifically, Saving Energy, Reducing Consumption, People-Oriented, Carrying out Sustainable Development, Serving our Customers and most of all keeping a high standard of quality for our products. Also providing safe working conditions and maintaining continuity of employment is of critical concern for Baoding Tianwei Baobian Electric Co., Ltd. Thus, Baoding Tianwei Baobian Electric Co., Ltd keeps adequate policies and procedures in order to ensure safe, efficient operating conditions for employees and its products.
- Key projects using large power transformers manufactured by Baoding Tianwei Baobian Electric Co., Ltd are as follows:
 - 1、 1 unit 1000kV Transformer for Wuhan High Voltage Research Institute, which is the highest voltage level in China now;
 - 2、 15 units 800 kV main transformers for Qinghai Yellow River Laxiwa Hydropower Station;
 - 3、 4 units 840MVA/500kV main transformers for Three Gorges Hydrojunction Project.
 - 4、 13 units DFP-370000/500 main transformers for Zhejiang Yuhuan Power Plant 1000MW Generating Units Project, which is installed with the first 1000 MW units in China; 6 DFP-380000/500 main transformers for Shangdong Zou County Power Plant 1000 MW Units Project, which is installed with the second 1000 MW units in China; 7 DFP-380MVA/500kV main transformer for Jiangsu Guodian Taizhou Power Plant, which is installed with the third 1000MW units in China;
 - 5、 4 units ODFPS-500MVA/750kV main transformers for Northwest China Power Grid, which has the highest voltage level in China.



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- 6、 2 units ZZDFPZ-278MVA/500kV DC transformers for Shenzhen Converter Transformer Station in Guiguang DC Project;
- 7、 1 unit 400MVA/220kV transformer for American Pacific Energy Company and 2 TX-300Mvar/230kV modulation transformers.
- 8、 All transformers for Qinshan Nuclear Power Plant Phase I (300MW generating unit) and Phase II (2×600MW generating units).
- 9、 The auxiliary transformers (25MVA, 32MVA) for Ling'ao Nuclear Power Plant.
- 10、 All transformers for the Chashima Nuclear Power Plant 300MW Unit in Pakistan.
- 11、 2 units 3-phase 800MVA main transformers for Huadian Wuhu Power Plant 2×660MW Units, 4 3-phase 720MVA/500kV main transformers for Huaneng Qinbei Power Plant 4×600MW Units, 4 3-phase 720MVA main transformers for Shanwei Power Plant and Huilai Power Plant 4×600MW Units, 2 3-phase 720MVA/500kV main transformers for Henan Hebi Power Plant 2×600MW Units.
- 12、 The main transformers for Huadian Weifang Power Plant 2×660MW Units, the main transformers for Inner Mongolia Datang Tuoketuo Power Plant 6×600MW Units, the main transformers for Luneng Hequ Power Plant 2×600MW Units, the main transformers for Guohua Dingzhou Power Plant 2×600MW Units, the main transformers for Guizhou Pannan Power Plant 4×600MW Units, the main transformers for Datang Shentou No.2 Power Plant 2×500MW Units, the main transformers for Guizhou Goupitan Hydropower Plant 5×600MW Units, etc.
- 13、 10 units OSFPSZ-240MVA/400kV main transformers for CLP Power Hong Kong Limited.
- 14、 1 unit OSFPSZ-750MVA/500kV main transformer for Fuzhou 500kV Substation.



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15、 8 units SSP-360MVA/500kV main transformer for the largest pump storage project in China named Guangdong Huizhou pump storage Station.

4 units 840MVA/500kV main transformers manufactured by our company for the Three Gorges Hydro junction Project have been successfully put into operation. The 500MVA/750kV main transformer for Northwest China Power Grid 750kV demonstration project, which is the first transformer with the highest voltage level in China, passed the test during the first testing on October 19, 2004. Up to now, 4 main transformers have been successfully put into operation after installed at site. The DFP-370MVA/500kV main transformer for Huaneng Yuhuan Power Plant 1000MW Units Project, which is installed with the first 1000MW Units in China, passed the test during the first testing on July 10, 2005, indicating that our company has become one of the leading and most advanced companies in the design, manufacture of Ultra HV transformers with large capacity in the world.

- Key products exported to the US in the past few years:
 - 1、 1 unit SFP-400MVA/230kV main transformer for PacifiCorp in 2002.
 - 2、 2 units PST-300MVA/230kV Phase Shifting Transformer for PacifiCorp in 2003.
 - 3、 1 unit SFZ-112MVA/236kV OLTC transformer for Virginia in 2004.
 - 4、 7 units SFZ-75MVA/236kV OLTC transformers for Virginia in 2005.

- All employees of Baoding Tianwei Baobian Electric Co., Ltd will meet the market challenge with full confidence and bravery, actively take part in market competition, and create the first rate achievements in new spirits. Baoding Tianwei Baobian Electric Co., Ltd will comply with the epigraph of "To Struggle for the Power Industry Development", which was written by the Chief of Central Government Mr. Wu Bangguo when he inspected the company. Baoding Tianwei Baobian Electric Co., Ltd will do its best to supply the best transformers for the power industry in China and abroad, provide efficient and excellent services, and contribute to the further development of our country's power industry.



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Attached picture 1: Baoding Tianwei Baobian Electric Co.,Ltd.- Manufacture base located in Baoding, Hebei.



Attached picture 2: Baoding Tianwei Baobian Electric Co., Ltd.- Manufacture base located in seaport Qinhuangdao.





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Attached picture 3: Baoding Tianwei Baobian Electric Co., Ltd.- Manufacture base located in Hefei.

