



上海电气电站设备有限公司上海电站辅机厂

Shanghai Electric Power Generation Equipment. Co., Ltd.

Shanghai Power Station Auxiliary Equipment Plant

企业使命

MISSION

能动全球工业 智创美好生活

Empower global industry Make life smarter

核心价值观

CORE VALUES

匠心卓越 价值创新 合作共赢 成就客户

Inspired ingenuity Genuine value

Meaningful partnerships Powerful solutions

我们是能源、工业领域热交换器系统解决方案的领跑者

**We are the leading provider of heat exchanger system solution
in energy and industrial field**



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公司简介

COMPANY PROFILE

上海电气电站设备有限公司上海电站辅机厂（SAP）成立于1980年，隶属于上海电气集团旗下的电站集团。SAP 下设一个营运中心，一个制造工厂。SAP 以制造高温、高压热交换器和压力容器为主营业务，以发展清洁高效能源、绿色环保为主要方向，在能源、工业领域为客户提供热交换器系统解决方案，在火电、核电、军工、光热、钢铁、化工等细分领域，创造了诸多市场业绩。SAP 已成为国内最大、国际重要的辅机产品与服务供应商。

我们致力于为客户提供优质的产品与服务，提升客户竞争力。

Shanghai Electric Power Generation Equipment Company Limited Shanghai Power Station Auxiliary Equipment Plant (SAP) was established in 1980. It is a subsidiary of SECPG (Shanghai Electric Power Generation Group) which is a subsidiary of SEC (Shanghai Electric Group Company Limited). SAP has an operation center and a factory. SAP is mainly engaged in manufacturing high-temperature, high-pressure heat exchangers and pressure vessels, developing clean and efficient energy and environmental protection as its main direction, providing customers with heat exchanger system solutions in energy and industrial fields, and creating many markets performance in thermal power, nuclear power, military industry, CSP (concentrating solar power), steel, chemical industry and other subdivisions. As the supplier of auxiliary equipment, SAP has become the largest provider in China and the important one in the world.

We are committed to provide customers with superior products and services to enhance customers' competitiveness.





营运中心

Operation Center

营运中心是以技术研发、市场销售、项目管理、人才培养为一体的管理中心。

The operation center is a management center integrating technology R&D, marketing & sales, project management and personnel training.



临港工厂

Lingang Factory

临港工厂占地面积近 22 万平方米，位于上海市浦东新区临港新城倚天路 186 号。工厂主要生产高低压换热器、冷凝器、除氧器、汽水分离再热器以及光热产品等，最大年产能 500 台。工厂拥有可泊靠 5000 吨级船只的码头，码头最大吊装能力 1400 吨，物流便捷。另外还设有产品实验中心，无损检测中心等配套设施。

Lingang factory, located at No. 186, Yitian Road, Lingang New City, Pudong New Area, Shanghai, covers an area of nearly 220,000 square meters. The main products of the factory are heat exchangers, condensers, deaerators, MSR (moisture separator reheater) and CSP, etc, with the maximum annual capacity of 500 sets. The factory is equipped with a specialized wharf with a maximum 1400t capacity crane for 5000-ton ships, making logistics convenient. There are also product testing center, nondestructive testing center and other supporting facilities in the factory.

先进的制
Advanced M
Techn

多元化
Diver
Prod



现代化的物流体系
Effective Logistics System



智能化的生产管理
Intelligent Production
Management





制造技术
Manufacturing
Technology



的产品
Diversified
Products



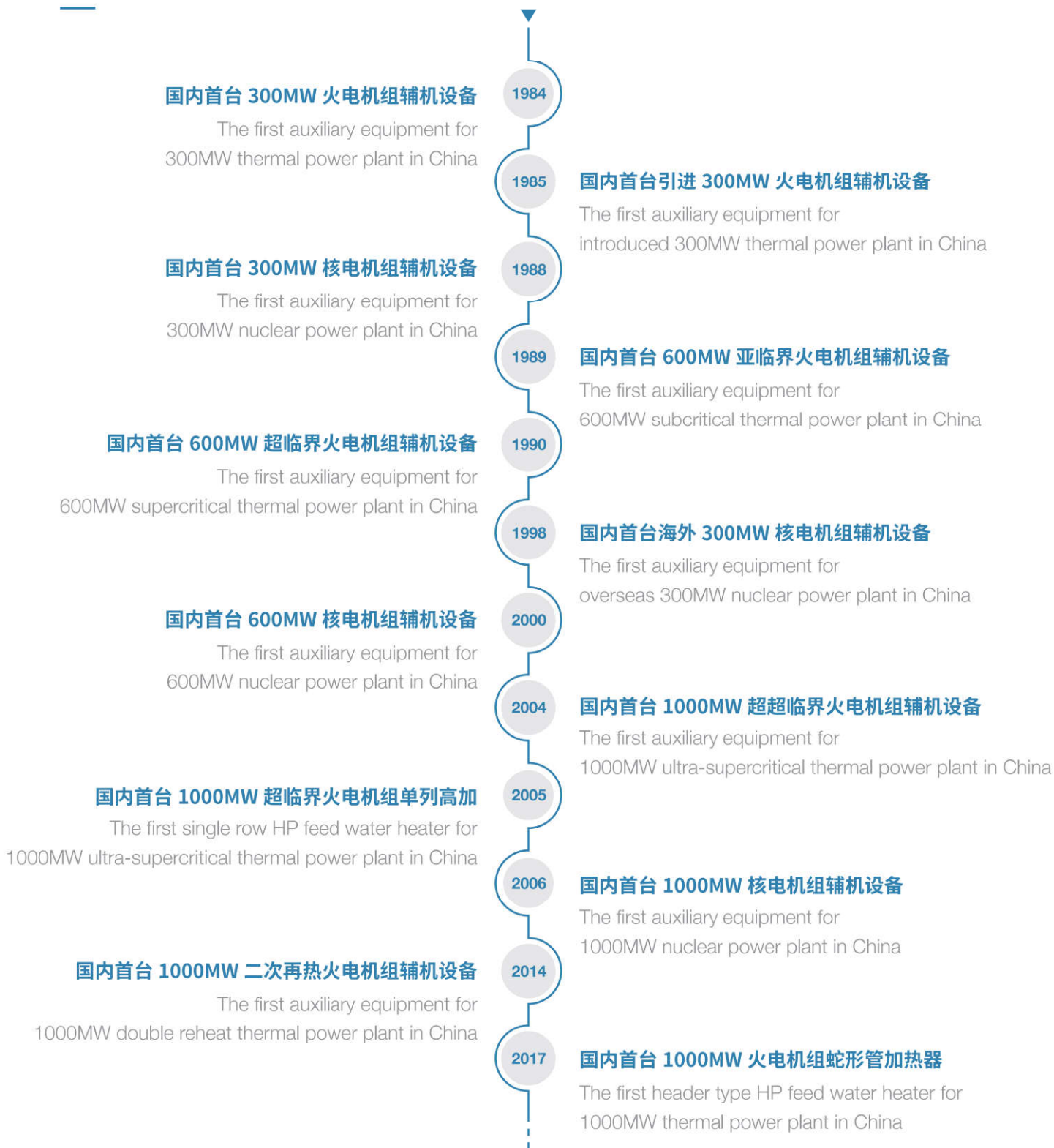
卓越的客户服务
Excellent Customer
Service



全面的质量管理
Comprehensive Quality
Management

公司历程

HISTORY



业务领域

BUSINESS SCOPE



• 燃煤电厂

Thermal Power Plant



• 燃机联合循环电厂

Combine Cycle Power Plant



• 核电厂

Nuclear Power Plant



• 光热电厂

CSP Power Plant



• 钢铁

Steel



• 化工

Chemical Industry



• 环保

Environmental Protection

公司资质 CERTIFICATE



ISO9001



ISO14001



OHSAS18001



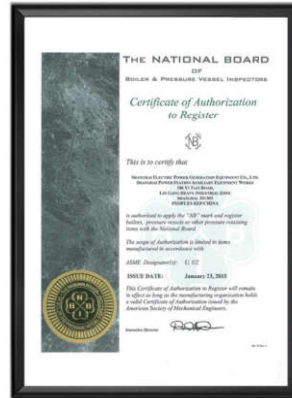
特种设备设计许可证



ASME U



ASME U2



NBBI



特种设备制造许可证



核安全设备制造许可证



核安全设备设计许可证

上海电气的创新 是对未来的发现
我们理解行业之需 探索更多创新可能
为客户创造非凡业绩

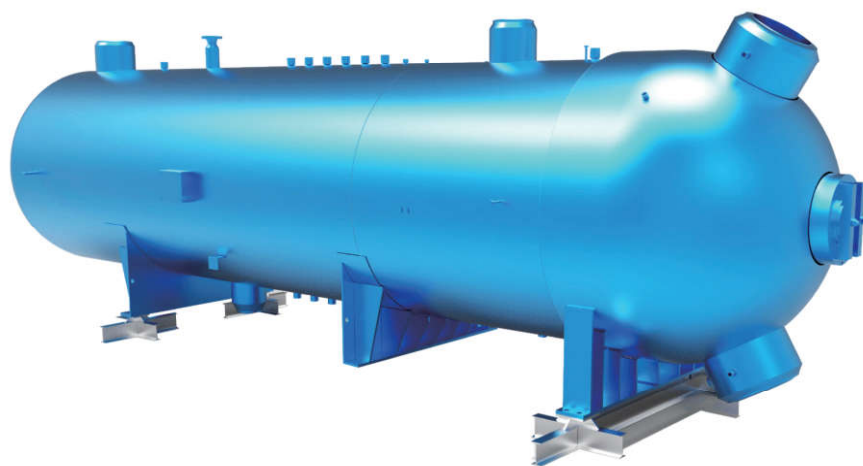
Shanghai Electric's innovation is a discovery of the future
We understand the industry's need to explore more innovation possibilities
Create extraordinary performance for customers



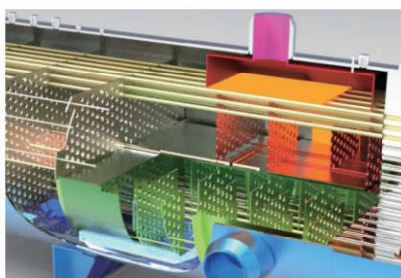
管壳式换热器

HEAT EXCHANGER

25 MW – 1700 MW

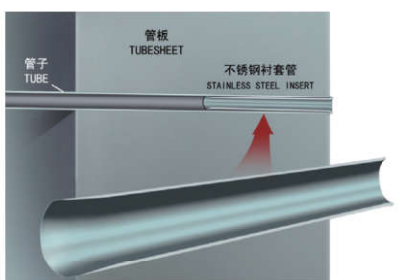


产品特点 Features



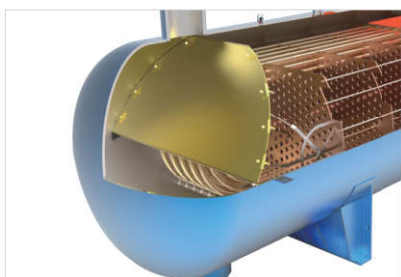
- 优化蒸冷段、凝结段结构达到更高的热效率。

Optimizing the structure of steam subcooling zone and condensing zone to achieve higher thermal efficiency.



- 设计专用衬套减少涡流对管端的损伤，降低换热管失效风险。

The tube bushing is designed to protect the heat-exchange tube from the impact of water and reduce the risk of heat exchange tube failure.



- 防振栅架和疏水汽化室设计，延长换热器寿命，保障机组安全运行。

Designing the Anti-vibration grid frame and drain vaporizer, which can extend the life of heat exchanger and ensure the safe operation of the unit.

蛇形管换热器

HEADER TYPE HEAT EXCHANGER

25 MW – 1700 MW



产品特点 Features

- 集管热弹性高且不产生热疲劳裂纹，保障设备运行安全可靠。

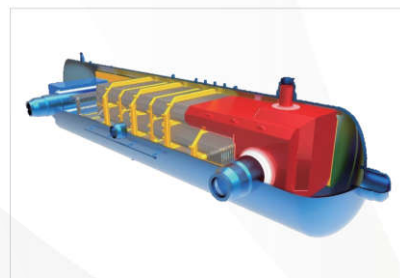
The header has high thermal elasticity and does not generate thermal fatigue cracks, ensuring safe and reliable operation.

- 蛇形管加热器换热管失效率仅 0.013%，寿命长且维护成本极低。

The header type heater's tubes is only 0.013% failure rate, with long operation time and extremely low maintenance cost.

- 快速启停（允许温升速率 10K/min），工况包容性好。

Fast start and stop (temperature rise rate is allowed to be 10K/min).



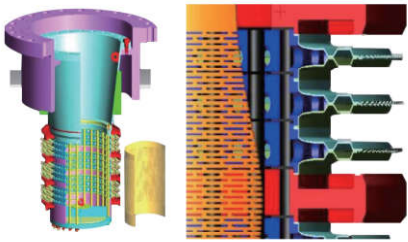
除氧器

DEAERATOR

25 MW – 1700 MW



产品特点 Features



- 采用大流量喷嘴，满足全区段负荷运行，雾化除氧效果好。
The large flow sprayer can meet the requirement of different load with good atomization and deoxygenation effect.



- 整体式除氧器在降低设备高度的同时减少蒸汽消耗量，提高机组热效率。
The integral deaerator reduces equipment height and steam consumption, and improves the unit thermal efficiency.

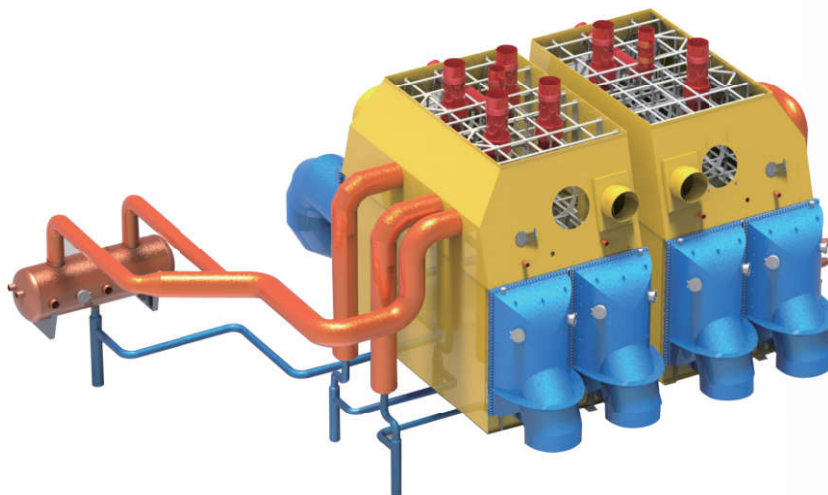


- 专利技术 - 除氧器高能介质减压扩容装置。
Patented technology - High pressure medium reducer.

凝汽器

CONDENSER

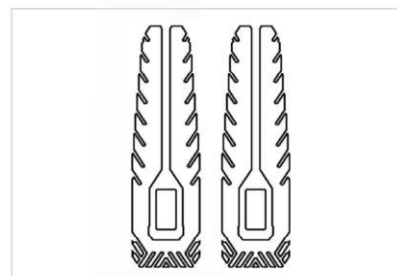
25 MW – 1700 MW



产品特点 Features

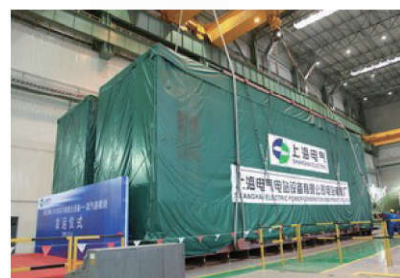
- 专利知识产权双塔型管束布置。热负荷分配均匀，流动路程短、阻力小，提高换热效率。

Patented technology - twin-tower bundle arrangement. Uniform distribution of heat load, short flow distance, low flow resistance, high heat transfer efficiency.



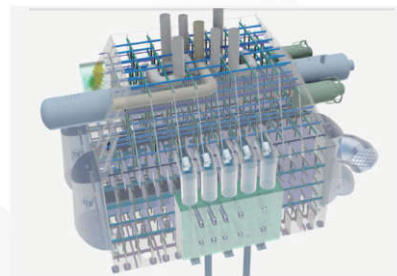
- 模块化出厂，减少现场安装工作量，提高工程质量。

The modular delivery reduces the installation work on site and improves the quality of the project.



- 冷却管防振分析计算，保障凝汽器在半边运行、旁路全开的恶劣工况下也能安全可靠运行。

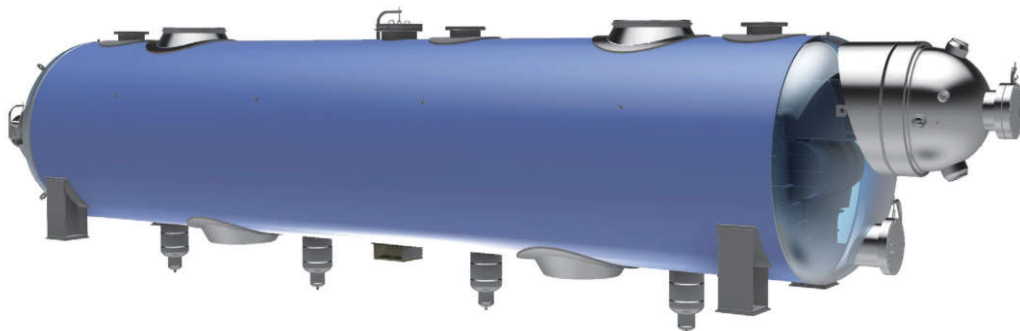
Vibration analysis and calculation are used to ensure the condenser operation safely and reliably even under the severe conditions such as half isolation or full open bypass.



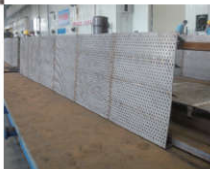
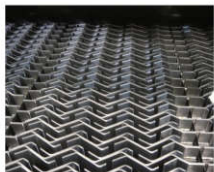
汽水分离再热器

MSR

25 MW – 1700 MW

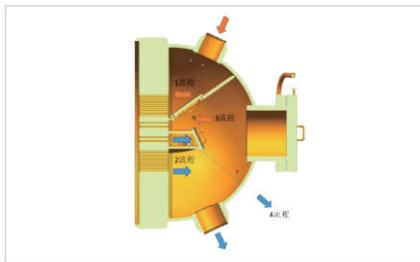


产品特点 Features



- 高效双钩波纹板分离片，结构紧凑，分离效率高，压降小。结合特殊多孔板结构，以均布设备内蒸汽，使汽水分离效果最大化。

Efficient chevron vanes, which has compact structure, high separation efficiency and small pressure drop, are used with special perforated plate to uniformly distribute steam in the equipment and maximize the separation effect of steam and water.



- 带扫排汽的四流程设计，压缩管束体积，避免冷凝管中产生堵塞或滞留。

The four-flow design, compress the bundle volume and avoid blockage or retention in the condensing tube.

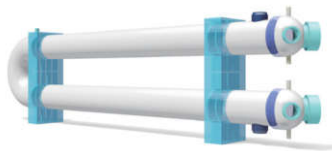


- MSR 管束通过振动分析校核且采用柔性包壳连接避免宽幅振动，运行安全可靠。

Vibration analysis and flexible cladding connection is adopted to avoid wide vibration, ensuring safe and reliable operation.

光热产品

CSP PRODUCT



过热器
Superheater



再热器
Reheater



汽包
Drum



预热器
Economizer

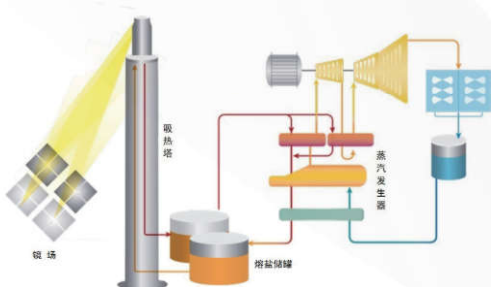


油盐换热器
Oil-to-Salt Heat Exchanger

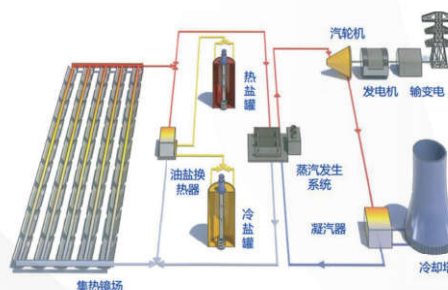
我们为塔式光热电站和槽式光热电站提供预热器、汽包、过热器、再热器和油盐换热器等设备。我们的技术能保障产品在各类苛刻的工况下安全、稳定、高效运行。

We provide the equipment and devices such as economizer, drum, superheater, reheater and oil-to-salt heat exchanger for central tower(CT) and parabolic-trough(PT) CSP power plants. Our technology can guarantee the safe, stable and efficient operation of the equipment in all kinds of demanding working conditions.

光热电站原理图 Schematic Diagram



塔式光热原理图
CT Schematic Diagram



槽式光热原理图
PT Schematic Diagram

核电产品

NUCLEAR POWER PRODUCT





ERP 安注箱
ERP Accumulator Tank



AP1000 安注箱
AP1000 Accumulator Tank



安全壳喷淋热交换器
Containment Spray Heat
Exchanger



正常余热排出热交换器
Normal Residual Heat
Removal Heat Exchanger



卸压箱
Pressure Relief Tank



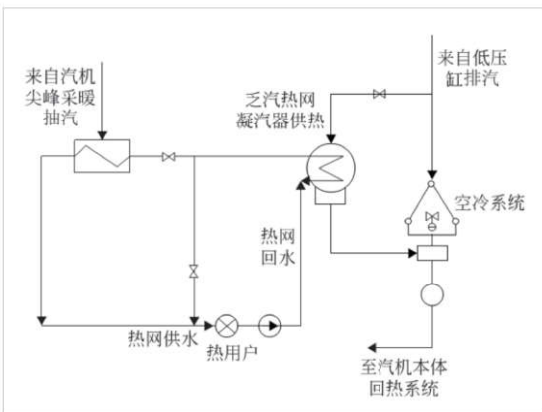
柴油机主贮油罐
Diesel Storage Tank

冷端改造

COLD END OPTIMIZATION

高背压供热系统改造 - 直接空冷供热机组

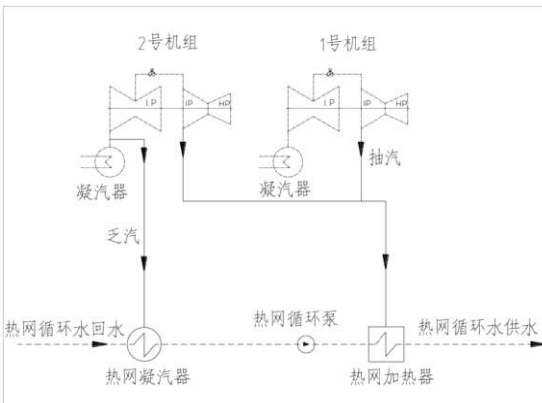
High back pressure heating system transformation
- Direct air cooling heating unit



330MW 供热机组改造前后经济性对比 Economic Comparison of 300MW Thermal Power Plant		
名称 Name	改造前 Before	改造后 After
乏汽利用量 Exhaust Steam Utilization Volume	/	335t/h
额定供热负荷 Rated Heating Load	371MW	514MW
发电负荷 Power Generation Load	264MW	270.8MW
平均发电标煤耗 Average Standard Coal Consumption	223.48g/kW.h	141.3g/kW.h
供热 + 发电收益 Heating & Electricity Generation Revenue	/	2,190 万元 RMB 21.9 million
总投资额 Total Amount of Investment	/	5,980 万元 RMB 59.8 million
静态投资年限比 Static Investment Years Ratio	/	2.7 年 2.7 Year

高背压供热系统改造 - 间接空冷超临界供热机组

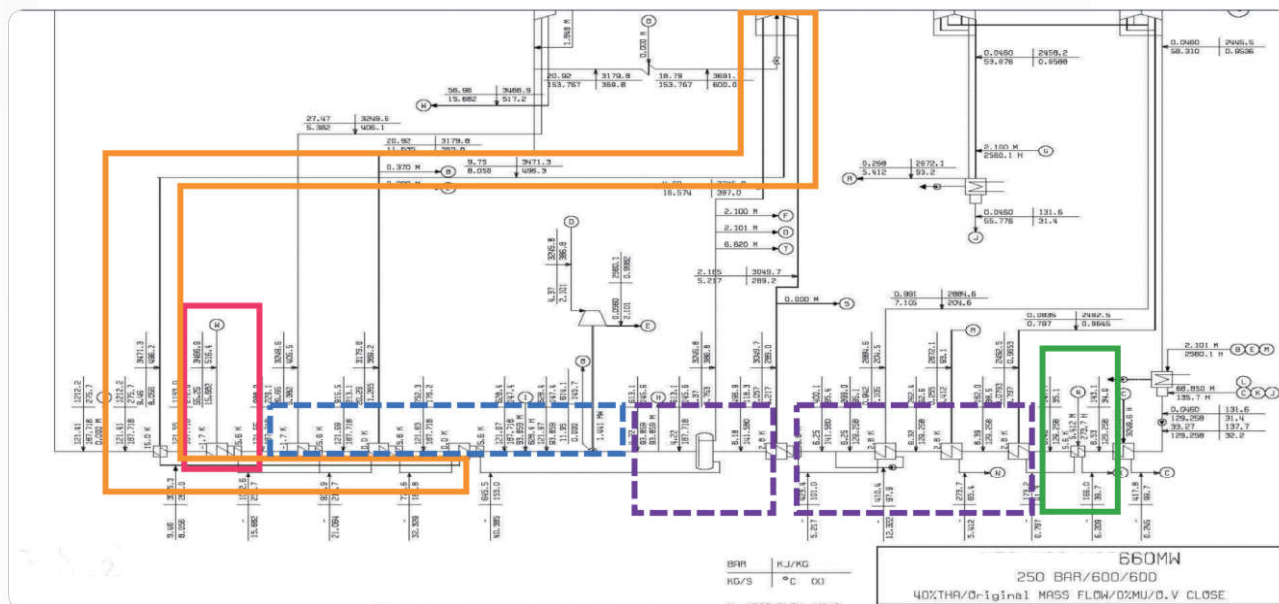
High back pressure heating system transformation
- Indirect air cooling supercritical heating unit



350MW 供热机组改造前后经济型对比 (65%THA) Economic Comparison of 350MW Thermal Power Plant(65%THA)			
名称 Name	改造前 Before	改造后 After	
	#1/2	#1	#2
乏汽利用量 Exhaust Steam Utilization Volume	/	/	346t/h
平均供热负荷 Average Heating Load	308MW	535MW	
采暖季平均发电负荷 Average Power Generation Load During Heating Season (65% THA)	227.5MW	227.5MW	
平均发电标煤耗 Average Standard Coal Consumption	221g/kW.h	194g/kW.h	
供热收益 Heating Generation Revenue	/	1,400 万元 RMB14 million	
总投资额 Total Amount of Investment	/	6,200 万元 RMB62 million	
静态投资年限比 Static Investment Years Ratio	/	5 年 5 Year	

热端改造

HOT END OPTIMIZATION



改造方案 Transformation Proposal	项目类型 Project Type	工况 Working Condition	给水出口温度提高 (°C) Increment of Feed Water Outlet Temperature (°C)	热耗降低 (kJ/kWh) Reduction of Heat Consumption (KJ/kWh)
抽汽回热综合利用 Comprehensive Utilization of Heat Recovery of Extraction Steam	600MW 亚临界 600MW Subcritical	THA	3.3	10.4
	1000MW 超超临界 1000MW Ultra-Supercritical	THA	3.3	14
宽负荷脱硝回热系统 Wide Load Denitration Heat Recovery System	660MW 超超临界 660MW Ultra-Supercritical	75%THA	22.15	31
		50%THA	30.2	48
	1000MW 超超临界 1000MW Ultra-Supercritical	75%THA	7.2	13
		50%THA	13.6	44

主要客户

CLIENT

中国 China



1000MW

中国国电泰州发电厂 #3

Guodian Taizhou Power Plant #3, China



2X1240MW

中国广东阳西热电二期

Guangdong Yangxi Thermal Power Plant Phase II, China



4X400MW

中国上海临港联合循环电厂

Shanghai Lingang Combine Cycle Power Plant, China



2X1000MW

中国上海外高桥电厂三期工程

Shanghai Waigaoqiao Thermal Power Plant Phase III, China

国际 Overseas

SAMSUNG

ALSTOM

SIEMENS

ENKA
Engineering for a Better Future

TOSHIBA

**MITSUBISHI HITACHI
POWER SYSTEMS**

DAELIM


**LARSEN & TOUBRO
LIMITED**

 **Greenesol Power Systems Pvt. Ltd.**
Green Energy Solutions... for a greener tomorrow.

 **TEI**
a Babcock Power Inc. company

**बी एच ई एल
BHEL**



DOOSAN


**BGR
ENERGY**


lointek



700MW

迪拜 DEWA 光热电厂
DEWA CSP Power Plant, Dubai



2X125MW

孟加拉巴库燃煤电厂
Barapukuria Coal-fired Power Plant,
Bangladesh



2X610MW

伊拉克华事德火电厂二期
WASSIT Thermal Power Plant Phase II,
Iraq

中国业绩

CHINESE PERFORMANCE

洛河 Luohe 300MW
蚌埠 Benbu 600MW
平山 Pingshan 1000MW

河坡 Hepo 300MW
宝鸡 Baoji 600MW
裕光 Yuguang 1000MW

临河 Linhe 300MW
大坝 Daba 600MW
方家庄 Fangjiazhuang 1000MW

天水 Tianshui 200MW
金昌 Jinchang 300MW
武威 Wuwei 300MW

伊犁 Yili 300MW
哈密 Hami 600MW
准东 Zhundong 600MW

西宁 Xining 300MW
桥头 Qiaotou 600MW

延安 Yanan 300MW
红墩界 Hongdunjie 600MW
横山 Hengshan 1000MW

十堰 Shiyang 300MW
江陵 Jiangling 600MW
汉川 Hanchuan 1000MW

丰都 Fengdu 200MW
南川 Nanchuan 300MW
奉节 Fengjie 600MW

东源 Dongyuan 200MW
雨汪 Yuwang 600MW
威信 Weixin 600MW

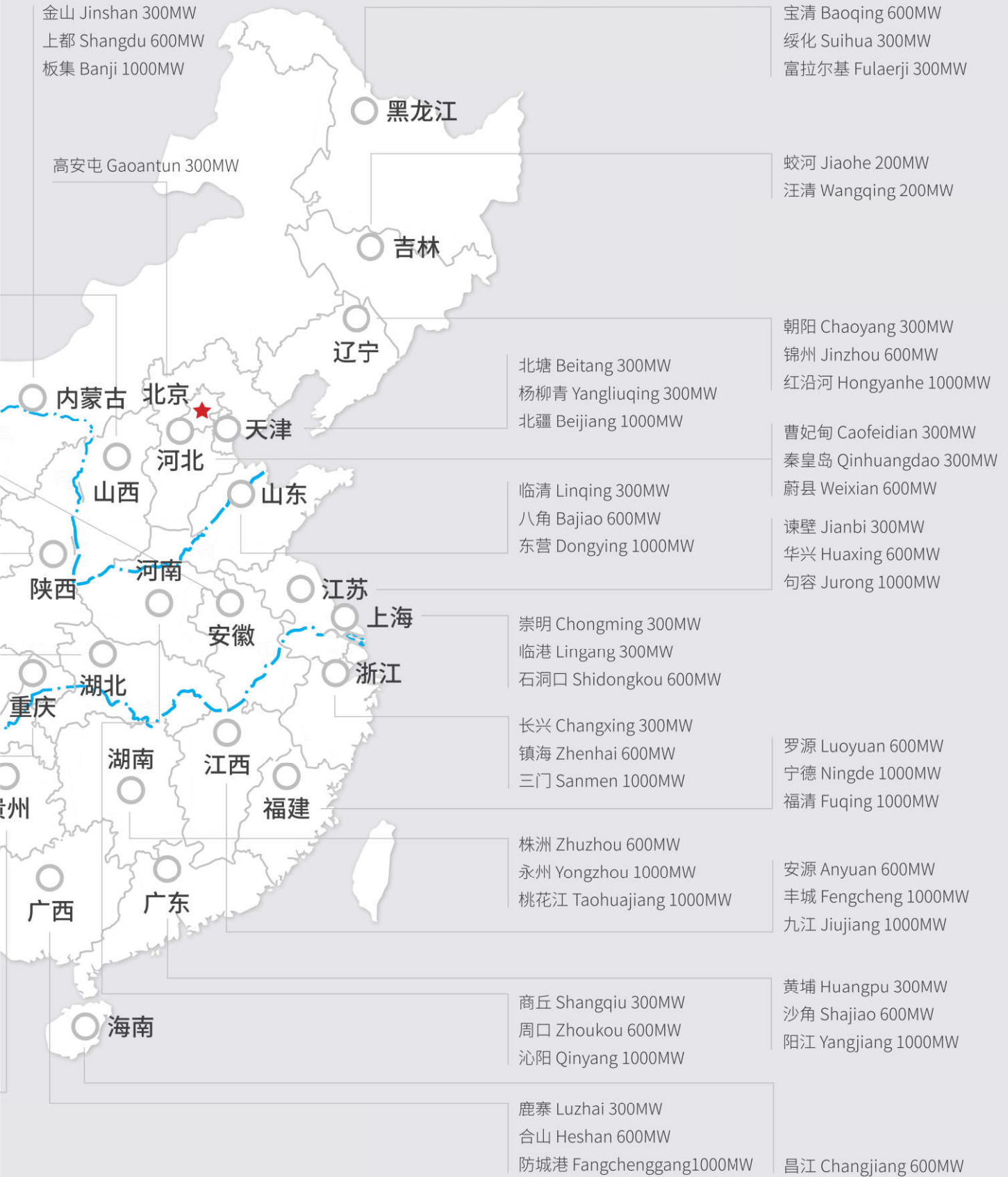
眉山 Meishan 200MW
通江 Tongjiang 200MW

赤峰 Chifeng 300MW
盘山 Panshan 600MW
普安 Puan 600MW



 **2000+** 套设备
2000+ Sets

 **500+** 座电厂
500+ Power Plants



全球业绩

GLOBAL PERFORMANCE

塞尔维亚 Serbia

科斯托拉茨 Kostolac 300MW

土耳其 Turkey

艾伦 Eren 600MW

卡拉比阿 Karabiga 600MW

斯洛比 Silopi 200MW

阿特拉斯 Atlas 600MW

因兹麦尔 Izmir 300MW


危地马拉 Guatemala

Jaguar 200MW

巴西 Brazil

匹琴 Pecem 300MW

伊塔克 Itaquera 300MW

 **400+** 套设备
400+ Sets

 **100+** 座电厂
100+ Power Plants

 **20+** 个国家
20+ Countries

伊朗
比斯通

白俄罗斯 Belarus

别列佐夫 Berezov 300MW

巴基斯坦 Pakistan

恰希玛 Chashma 300MW

卡拉奇 Karachi 1000MW

萨西瓦尔 Sahiwal 600MW

塔尔 Thar 600MW

胡布 Hubco 600MW

蒙古 Mongolia

巴格诺 Baganuur 300MW

孟加拉 Bangladesh

石卡巴哈 Sikabaha 200MW

库尔纳 Khulna 200MW

伊拉克 Iraq

华事德 Wassit 300MW

越南 Vietnam

广宁 Quang Ninh 300MW

冒溪 Mao Khe 200MW

印度 India

奥萨 Ausa 200MW

比罗德 Birod 200MW

大印恰 Jharsuguda 600MW

瑞吉 Ratnagiri 300MW

莎圣 Sasan 600MW

BALCO 300MW

BHEL 600MW

希萨尔 Hissar 600MW

Ind Barath 300MW

KMPCL 600MW

Manha 600MW

RKM 300MW

罗莎 Rosa 300MW

瑟拉亚 Salaya 600MW

SKS 300MW

波特瑞 Butibori 300MW

昌德拉普 Chandrapur 300MW

哈迪亚 Haldia 300MW

佳凯德 Jakadevi 600MW

卡玛琅戈 Kamalanagar 300MW

塔尔万迪 Talwandi 600MW

瓦罗拉 Warora 300MW

菲律宾 Philippines

迪格宁 GNPD 600MW

考斯瓦根 Kauswagan 200MW

普丁巴图 Puting Bato 200MW

马来西亚 Malaysia

穆卡 Mukah 200MW

印度尼西亚 Indonesia

巴厘岛 Bali 200MW

巴林基安 Balingian 300MW

公主港 Pelabuhan Ratu 300MW

棉兰 Medan 200MW

南苏 Sumatera Selatan 300MW

阿迪帕拉 Adipala 600MW

金光 Sinar Mas 70MW

青山 Tsingshan 300MW

芝拉扎 Cilacap 1000MW

爪哇 Jawa 1000MW

Iran

Bistoun 300MW



中国上海市隆昌路 621 号 (200090)
No.621 Longchang Road, Shanghai, PRC
电话 TEL: 86-21-60708088
<http://www.shanghai-electric.com>