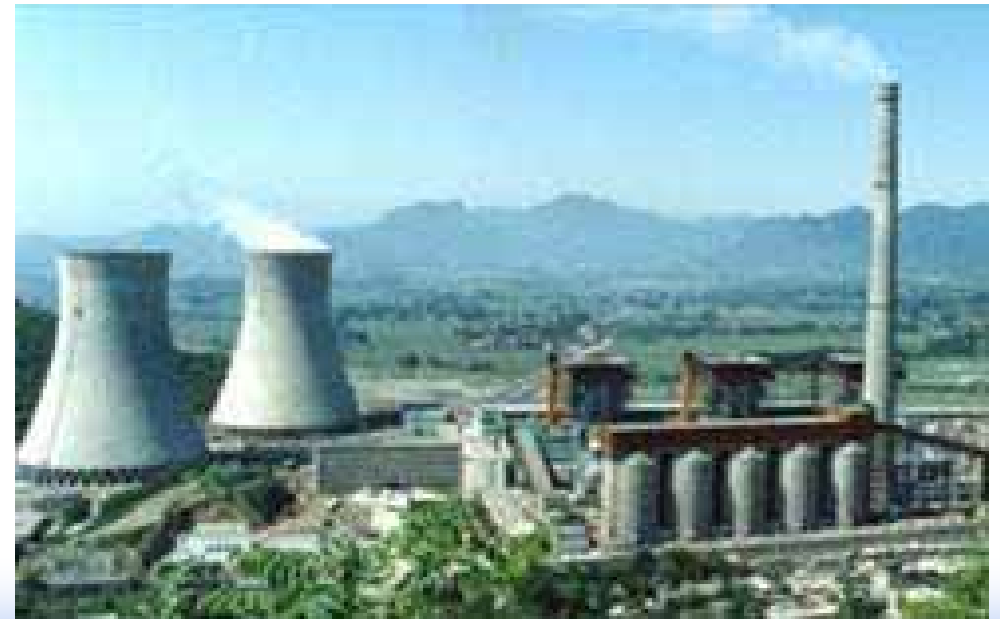


Thermal Power Plant



Allbest Creative Development Ltd. (ALLBEST)

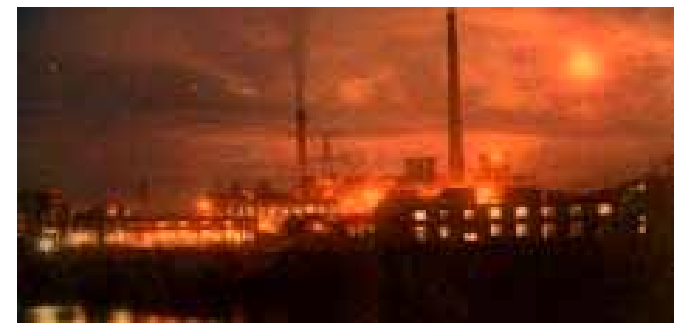
Integrated Technology and Equipment for Thermal Power Plant



Integrated Technology and Equipment for Thermal Power Plant



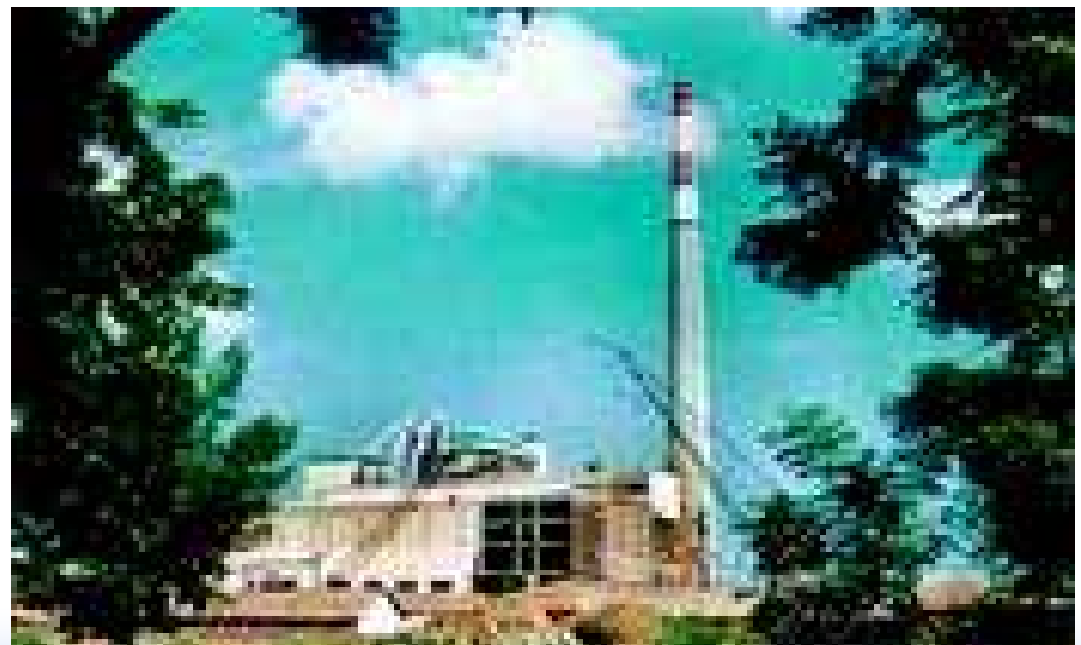
东北院设计的哈尔滨第三发电厂（2x60万千瓦）



华东院设计的巴基斯坦恰希玛核电站（1x30万千瓦）



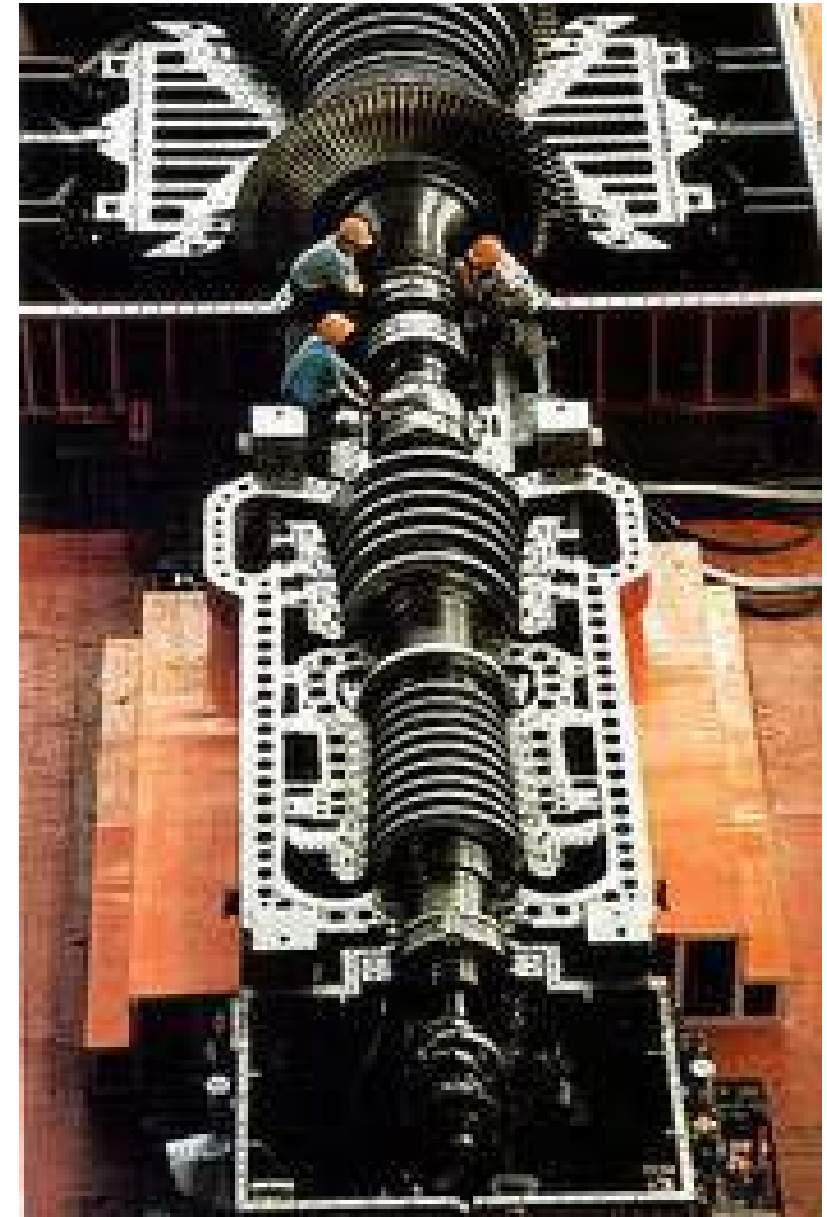
Integrated Technology and Equipment for Thermal Power Plant



Introduced Manufacturing Technology for the Equipment

We developed our own technology and also introduced manufactured technology from:

- CE
- Westinghouse
- Siemens
- ALSTOM
- ABB
- GE
- BRUSH/UK
- Others



Reliable Units of Steam Turbine & Generator



3x50 MW Power Plant, Pakistan



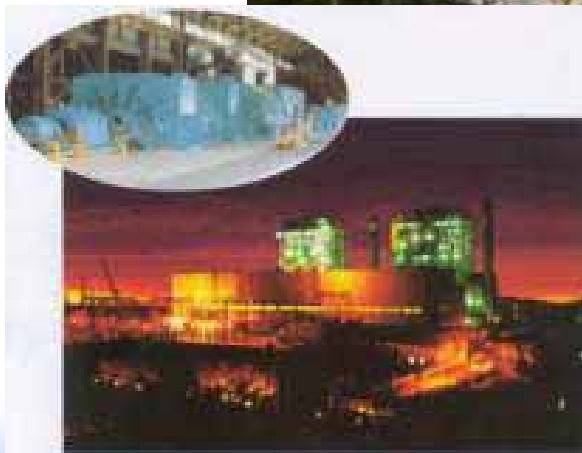
2x50 MW Power Plant, Malaysia



3x125 MW Power Station, Vietnam



2x210 MW Power Plant, Bangladesh



2x210, 1x320 MW Power Station, Pakistan



586 MW Co-generation project, Pakistan



2x50 MW, Xuzhou, Jiangsu



2x142+2x187 MW Co-Generation, Huaneng, Beijing



2x200 MW Co-generation, Shengli Oil Field, Shandong



2 x 200 + 2 x 300 MW Co-Generation, Qinghuangdao



4x300 MW Mawan, Shenzhen



8x300 MW Zhangjiakou, Hebei



2x500 MW, Shentou No. II, Shanxi



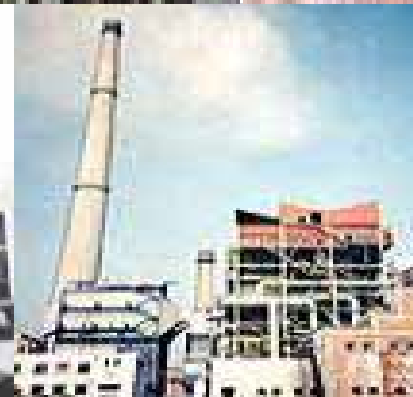
2x600 MW Power Station, Shanghai



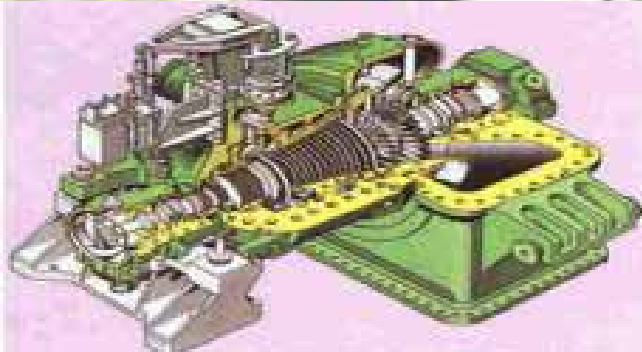
2x500, 2x600 MW, Panshan



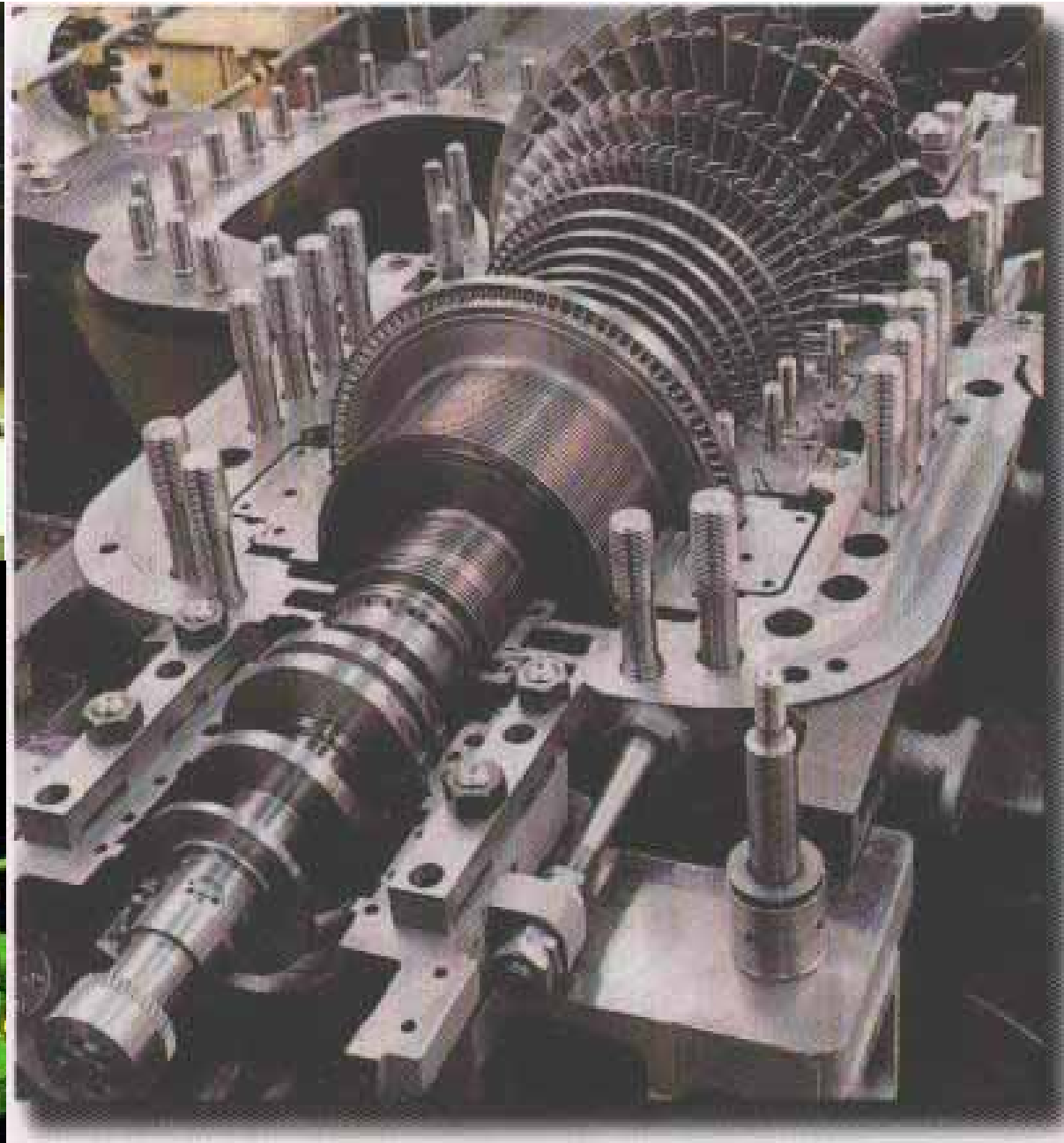
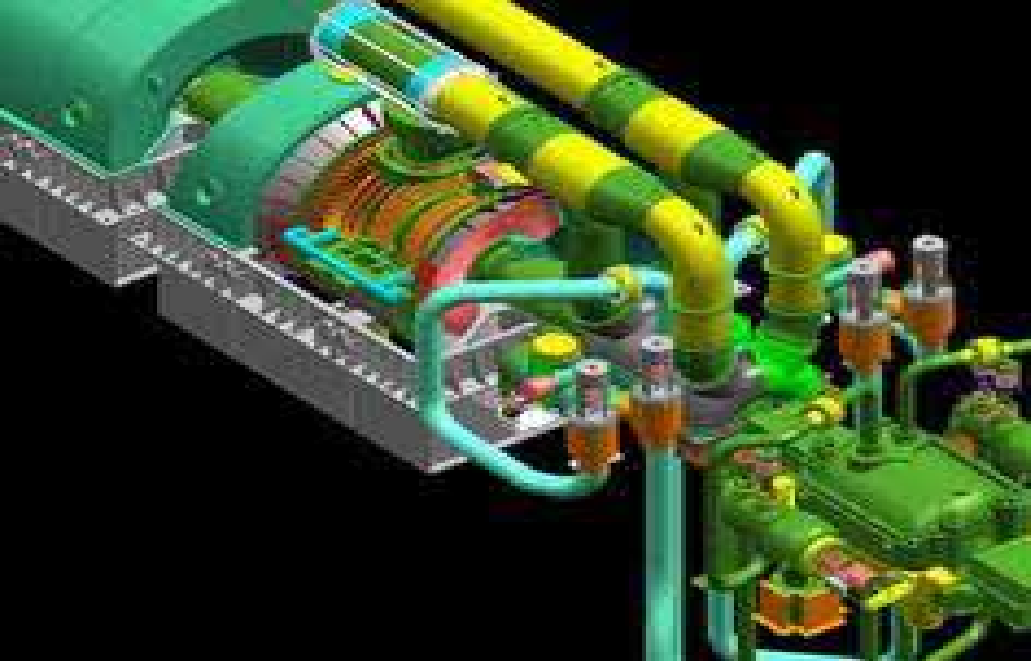
Boilers & CFB Boilers



Steam Turbine



Steam Turbine



Generators



Generation Unit



Generation Units



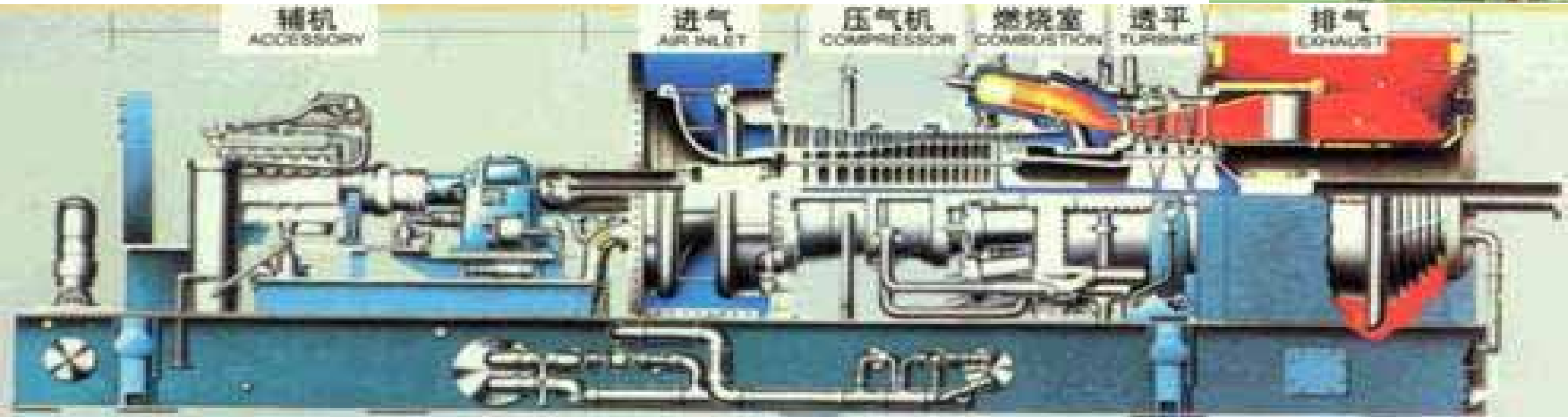
Gas Turbine Generating Set & Combined Cycle Power Plant



55 MW combined cycle power plant, Changzhou, China

BA relationship with GE for Gas Turbines:

- MS3002 (10 MW)
- MS5001 (26 MW)
- MS 6001B_PG6551B (38 MW)





Integrated solutions for sustainable development

Environmental Technology



Clean water recycling system



Pure water treatment system



EP



Bag filter

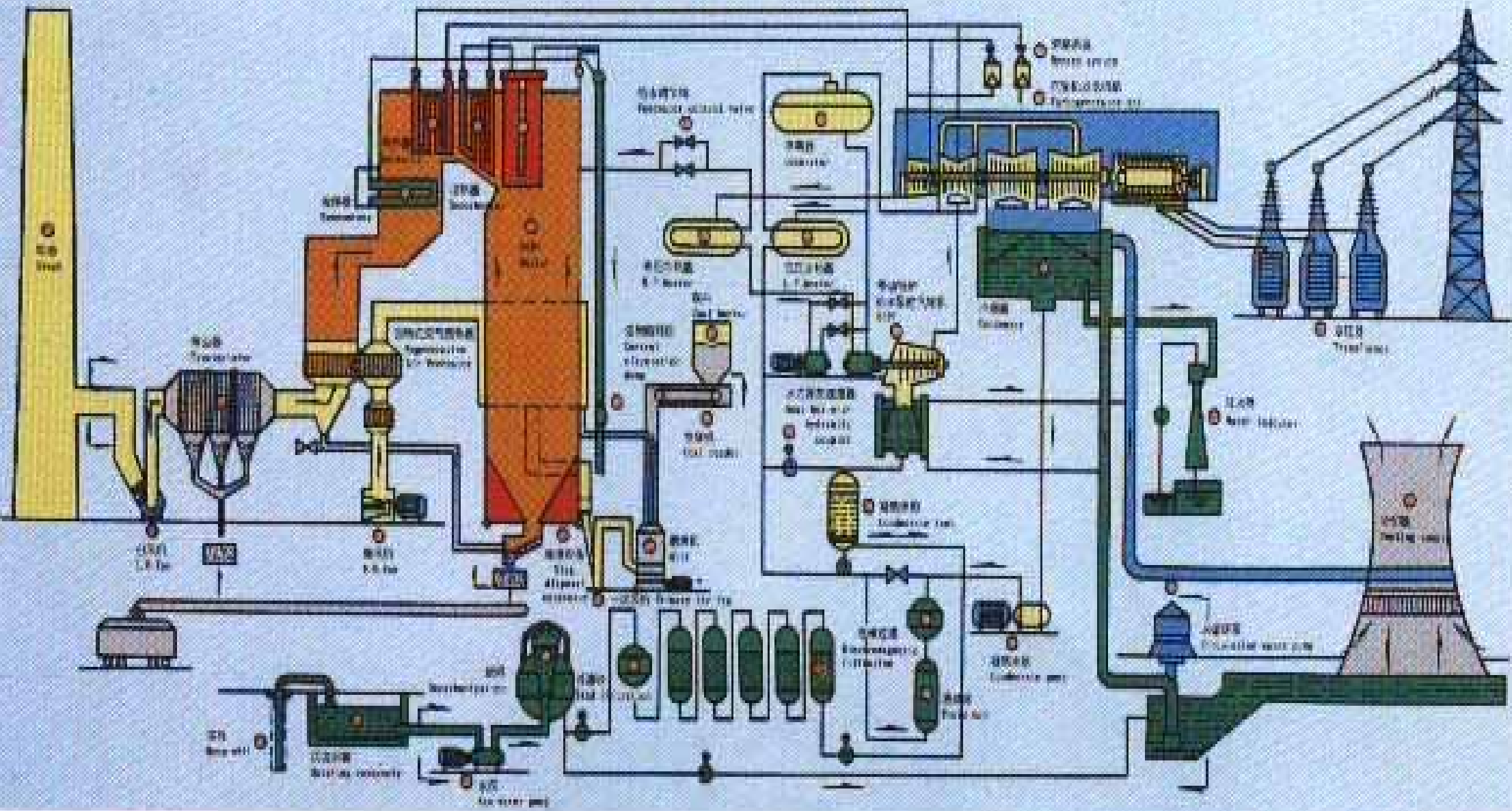


Used water recycling and treatment facilities

Automation



火力发电站系统示意图
Systematic Scheme of Utility Power Station



Substation and Transmission Line

35 KV, 110 KV, 132 KV, 220 KV, (230 KV) and 500 KV



Specification of Condensing Thermal Power Units (A1/6)

Item (Unit) \ Unit capacity	6 MW	12 MW	25 MW	50 MW	100 MW
1. Turbine					
Rated output KW	6000	12000	25000	50000	100000
max. output KW			30000	60000	112000
Speed r/min	3000	3000	3000	3000	3000
Steam press. before stop valve MPa(abs)	3.43	3.43 3.4	8.83 8.8	8.83	8.83
Steam temp. before stop valve °C	435	435	535	535	535
rated steam flow t/h	30.08 30.0	54.8	106	190	370
max. steam flow t/h			120	210	410
Reheat steam temp.°C					
Exhaust steam press MPa(abs)	0.0081	0.0068	0.00412	0.0049	0.0049
cooling water temp. °C	27	25	15	20	20
heat rate kj/kwh	13060.1	11916	10299.53	9466.35	9020.59

Specification of Condensing Thermal Power Units (A2/6)

Item (Unit) \ Unit capacity	6 MW	12 MW	25 MW	50 MW	100 MW
2. Boiler					
evaporative capacity t/h	35	75	110 11	220 22	410
output steam press MPa(kgf/sq.cm)	3.8(39)	3.8(39)	9.8(100)	9.8(100)	9.8(100)
output steam temp. °C	450	450	540	540	540
feeding water temp. °C	150	150	215	215	220
fuel	Coal/Oil	Coal/Oil	Coal/Oil	Coal/Oil	Coal/Oil
Burning	pulverized coal combustion; fluidized bed, traveling grate		pulverized coal; fluidized bed		Pulverized coal

Specification of Condensing Thermal Power Units (A3/6)

Item (Unit) \ Unit capacity	6 MW	12 MW	25 MW	50 MW	100 MW
3 . Turbo generator					
active power KW	6000	12000	25000	50000	100000
apparent power KVA	7500	15000	31250	62500	117500
power factor	0.8	0.8	0.8	0.8	0.85
voltage V	6300,10500	6300	6300	10500	10500
current A	688, 413	1375	2860 286	3440	6475
speed r/min speed r/mi	3000	3000	3000	3000	3000
frequency Hz	50	50	50	50	50

Specification of Condensing Thermal Power Units (B1/6)

Item (Unit) \ Unit Capacity	125 MW	200 MW	210 MW	300 MW	600 MW
1. Turbine					
rated output KW	125000	205300	210000	300000	600000
max. output KW	131000	221600	223268	330000	654000
Speed r/min	3000	3000	3000	3000	3000
Steam press. before stop valve MPa(abs)	13.2	12.749	12.749	16.67	16.67
Steam temp. before stop valve °C	535	535	535	537	537
Reheat steam flow t/h	400	610	629.1	910	1781
max. steam flow t/h	420 42	670	680	1021	1990
Reheat steam temp. °C	535	535	535	537	537
Exhaust steam press. MPa(abs)	0.0049	0.00515	0.00711	0.00539	0.00539
Cooling water temp. °C	20	20	27	20	20
heat rate kj/kwh	8499.2	8331.4	8408.7	7955	7901.4

Specification of Condensing Thermal Power Units (B2/6)

Item (Unit) \ Unit Capacity	125 MW	200 MW	210 MW	300 MW	600 MW
2. Boiler					
Evaporative capacity t/h	420	670	680 68	1025 102	2008
Output steam press. MPa(kgf/sq.cm)	13.7(140)	13.7(140)	13.7(140)	18.2(186)	18.2(186)
output steam temp. °C	540/540	540/540	540/540	540/540	540/540
Feeding water temp. °C	240	247	251	270.1	278.3
Fuel	Coal/Oil	Coal/Oil	Oil/Gas	Coal	Coal
burning	pulverized coal			pulverized coal	

Specification of Condensing Thermal Power Units (B3/6)

Item (Unit) \ Unit Capacity	125 MW	200 MW	210 MW	300 MW	600 MW
3 . Turbo generator					
active power KW	125000	200000	210000	300000	600000
apparent power KA	147000	235000	247000	353000	667000
power factor	0.85	0.85 0.8	0.85	0.85	0.90
voltage V	13800	15750	15750	20000	20000
current A	6150 615	8625	9056 905	10190	19245
speed r/min	3000	3000	3000	3000	3000
frequency Hz	50	50	50	50	50

Steam generated from Co-generation Plant

Capacity (MW)	Pressure of Steam Provided (MPa)							
6		1.27	1.18	0.981	0.49	0.294	0.196	
12	4.02	1.27	1.18	0.981	0.49	0.294	0.172	0.118
25	4.02	1.28		0.981			0.196	0.118
50		1.27		0.981	0.48			0.118
100		1.27						0.118
200			1.079			0.245		

Specifications of Co-generation Steam Turbine (1/4)

Designation \ Item (Unit)	6 MW Back-press.	6 MW Single extract.	6 MW Single extract.	12 MW Back-press.	12 MW Single extract.
Model	1	2	3	4	5
Rated output KW	6000	6000	6000	12000	12000
Max. output KW Max. output K		6000	6000	13473	12000
Speed r/min	3000	3000	3000	3000	3000
Steam pres. before stop valve MPa (abs)	3.432	4.9	4.9	8.826	4.9
Steam temp. before stop valve °C	435	435	435	535	470
Rated/Max. steam flow t/h	65.41	44/50.3	50.33/70.66	253.8/280	79.7/107.2
Extract steam pres. for process MPa(abs)		0.49	0.981	4.02	0.49
Rated/Max. extract. steam for process t/h		25/35	30/50	245/259	50/70
Extract steam pres. for heat supply MPa(abs)	Exhau.Pres.0.49				
Rated/Max. extract. steam for heating t/h					

Specifications of Co-generation Steam Turbine (2/4)

Designation \ Item (Unit)	12 MW Single extract.	12 MW Double extract.	12 MW Double extract.	25 MW Single extract.	25 MW Single extract.
Model	6	7	8	9	10
Rated output KW	12000	12000	12000	25000	25000
Max. Output KW Max. Output K	12000	15000	14000	30000	30000
Speed r/min	3000	3000	3000	3000	3000
Steam pres. before stop valve MPa (abs)	4.9	4.9	3.432	8.826	8.826
Steam temp. before stop valve °C	470	470	450	535	535
Rated/Max. steam flow t/h	87.94/109.1	100.5/117.5	114/128	125/168	169/211
Extract steam pres. for process MPa(abs)	0.981	0.981	0.98		0.98
Rated/Max. extract steam for process t/h	50/80	25/70	50/80		110/130
Extract. steam pres. for heat supply MPa(abs)		0.49	0.118	0.118	
Rated/Max. extract steam for heating t/h		40/70	40/60	85/115	

Specifications of Co-generation Steam Turbine (3/4)

Designation \ Item (Unit)	25 MW Double extract.	25 MW Double extract.	50 MW Single extract.	50 MW Single extract.	50 MW Double extract.
Model	11	12	13	14	15
Rated output KW	25000	25000	50000	50000	50000
Max. output KW Max. output K	30000	30000	60000	60000	60000
Speed r/min	3000	3000	3000	3000	3000
Steam pres. before stop valve MPa (abs)	8.826	8.826	8.826	8.826	8.826
Steam temp. Before stop valve °C	535	535	535	535	535
Rated/Max. Steam flow t/h	153 / 210	155.25 / 196.7	235 / 291	341 / 396.8	299 / 358
Extract steam pres. for process MPa(abs)	0.98	1.275		1.28	0.98
Rated/Max. Extract. steam for process t/h	60 / 100	60 / 100		200 / 230	125 / 200
Extract steam pres. for heat supply MPa(abs)	0.118	0.118	0.118		0.118
Rated/Max. Extract. steam for heating t/h	46 / 90	40 / 90	160 / 200		90 / 150

Specifications of Co-generation Steam Turbine (4/4)

Designation \ Item (Unit)	50 MW Double extract.	100 MW Single extract.	100 MW Double extract.	200 MW Single extract.	200 MW Double extract.
Model	16	17	18	19	20
Rated output KW	50000	100000	100000	145000 / 200000	140000 / 200000
Max. Output KW Max. Output K	60000	125000	125000	219200	217900
Speed r/min	3000	3000	3000	3000	3000
Steam pres. before stop valve MPa (abs)	8.826	8.83	8.83	12.748	12.748
Steam temp. before stop valve °C	535	535	535	535	535
Rated/Max. steam flow t/h	321 / 416	444 / 565	566 / 708	610 / 670	610 / 670
Extract steam pres. for process MPa(abs)	1.28	0.981	1.27		1.0787
Rated/Max. extract steam for process t/h	140 / 230	100 / 135	200 / 350		50 / 50
Extract. steam pres. for heat supply MPa(abs)	0.118		0.118	0.2452	0.2452
Rated/Max. extract steam for heating t/h	100 / 160		150 / 250	405 / 450	350 / 390

Service

- **Advanced and reliable technology & engineering**
- **Procurement, manufacture, and delivery of the goods**
- **Project management**
- **Construction, installation, and commissioning**
- **Technical service**
- **Training program**
- **Service after completion of the project**
- **Financing assistance and export credit**
- **Other services and functions upon request**



CREATE THE FUTURE



Allbest Creative Development Ltd. (ALLBEST)

Beijing, China

allbest@china.com