

ShaanGu

Industrial Service Introduction

XI'AN SHAANGU POWER CO.,LTD



为人类文明创造绿色动力
Create Green Power For Human Civilization

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Company Profile

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System Service Solutions

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Classic Service Cases

- 
- 1.1 ShaanGu-EKOL History
 - 1.2 ShaanGu Main Products
 - 1.3 Main Fields Serviced
 - 1.4 International Certificates

1.1 ShaanGu-EKOL History

1996

2007

2013

2014



Group starts



**Acquisition of
Xi' an Instrument
& Xi' an Boiler**



**Smart company
starts**



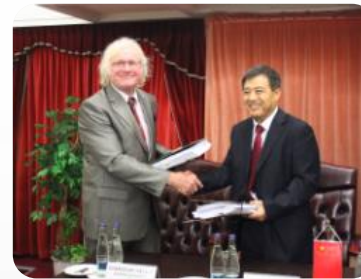
**Acquisition of Dagang
Road Machinery**



**Shaangu Power
starts**



**Shaangu Power
IPOed**



**Acquisition of
EKOL Czech**



**Establish of EU
MRO Center**

1999

2010

2015

2017

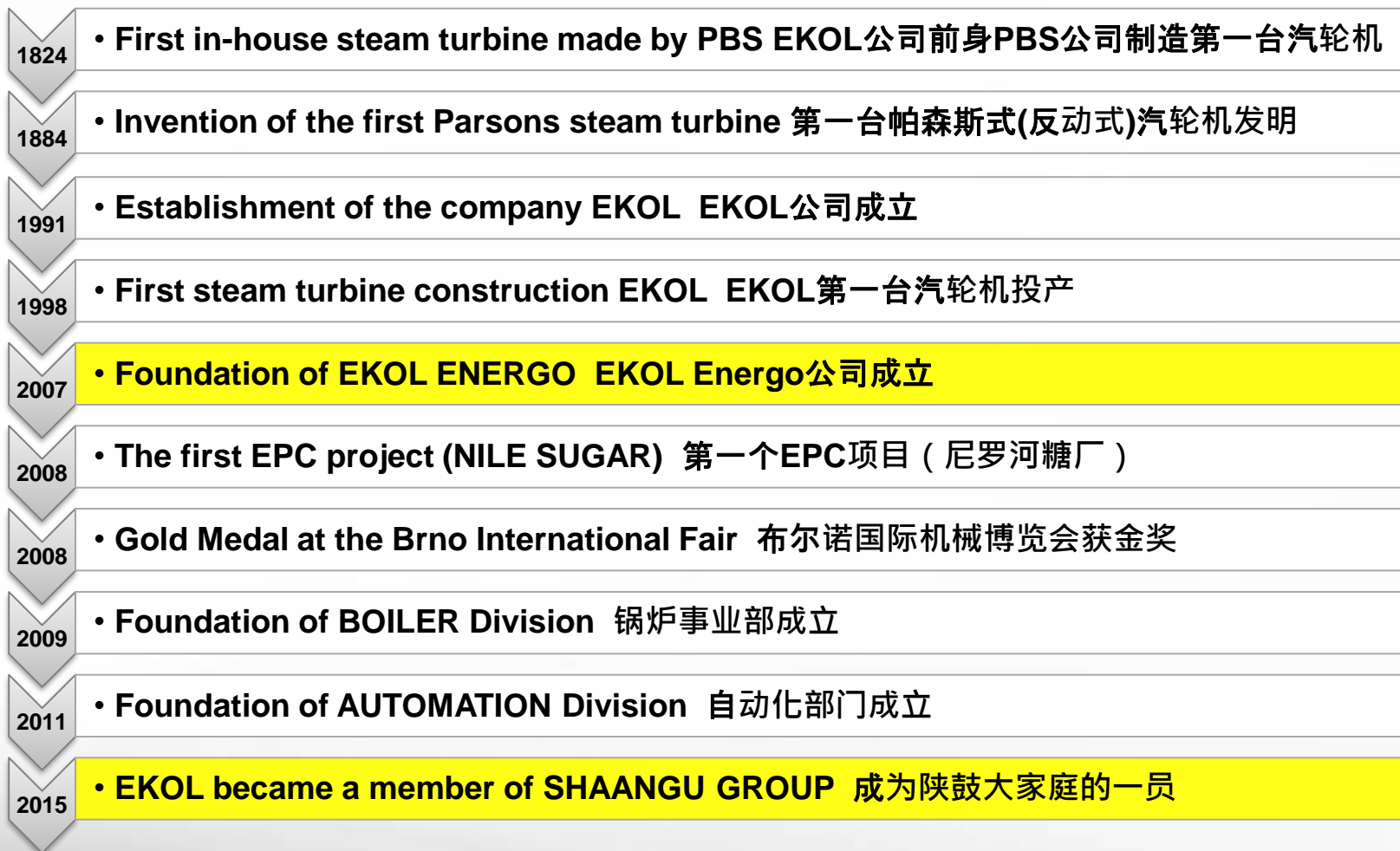


**Establishment
1968**



为人类文明创造绿色动力
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1.1 ShaanGu-EKOL History



1.2 ShaanGu Main Products

Axial Compressor



Centrifugal Compressor



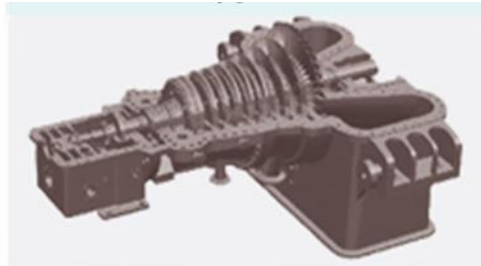
Energy Recovery Turbo-expander



Centrifugal Blower



Steam Turbine



Fan



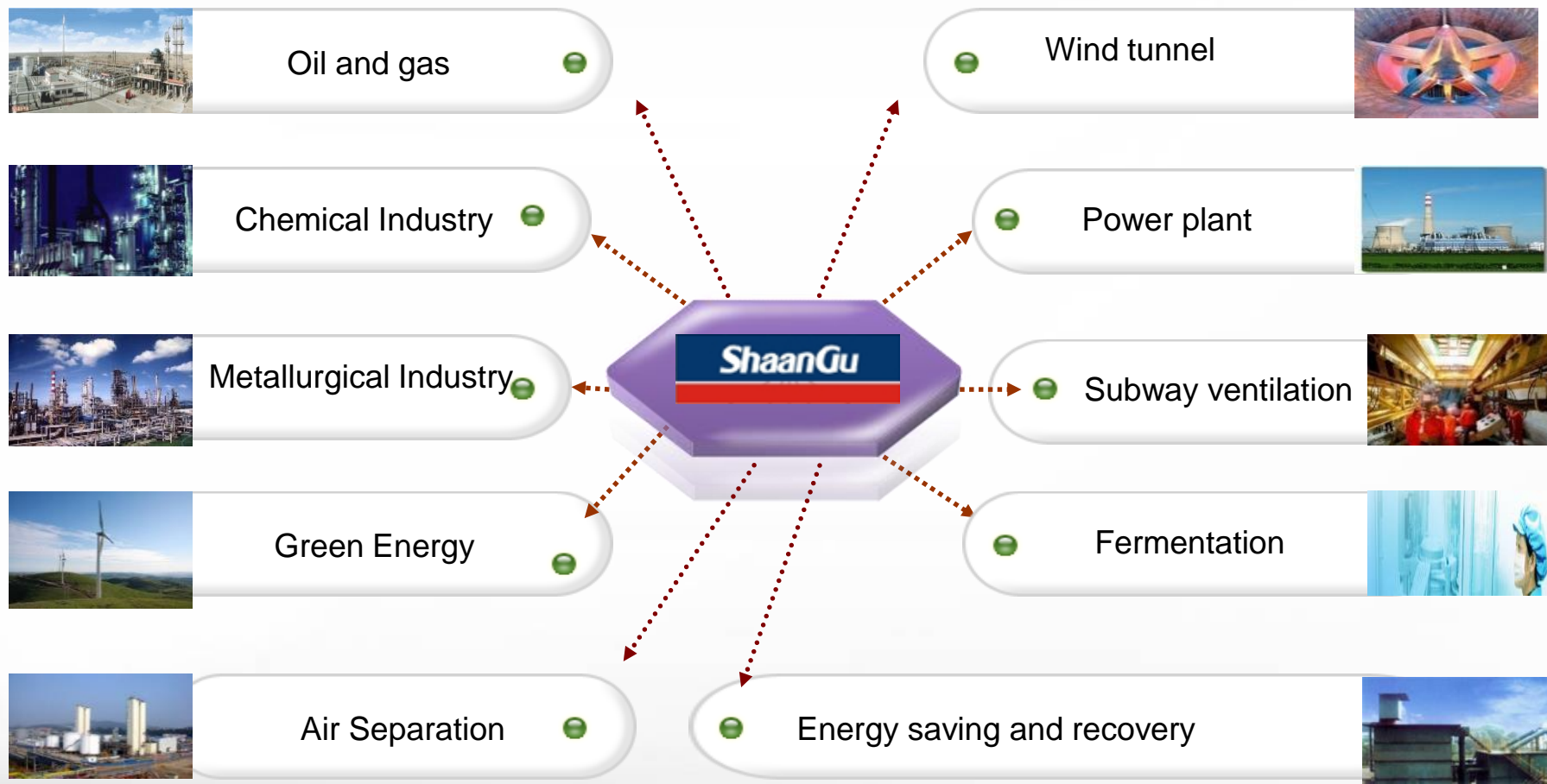
Instruments



Boiler



1.3 Main Fields Serviced



1.4 International Certificates(CN)



1994

ISO9001 Quality
System Certificate



2001

ISO 14001
Environmental
Management
System
Certificate



2004

OHSAS18000
Occupation Health &
Safety Management
System Certificate



2009

GJB 9001A
Military Quality
Management
System
Certificate

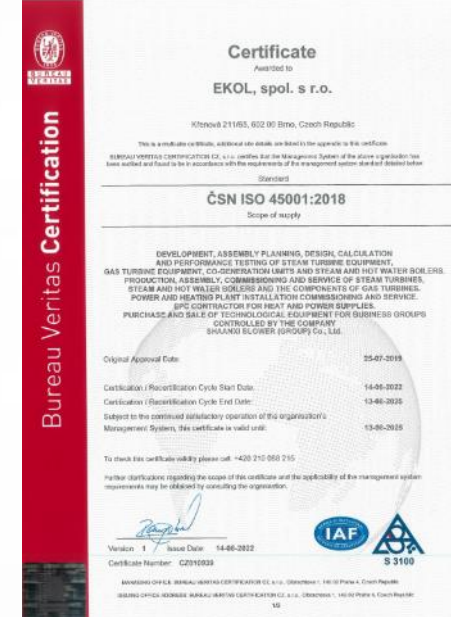
1.4 International Certificates(EU)



ISO9001 Quality System Certificate



ISO 14001 Environmental Management System Certificate



ISO 45001 Occupational Health & Safety Management System Certificate

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Classic Service Cases



➤2.1 Our Service Goal

➤2.2 Organization Structure

➤2.3 Service Facilities

➤2.4 Global Marketing

➤2.5 Industrial Services

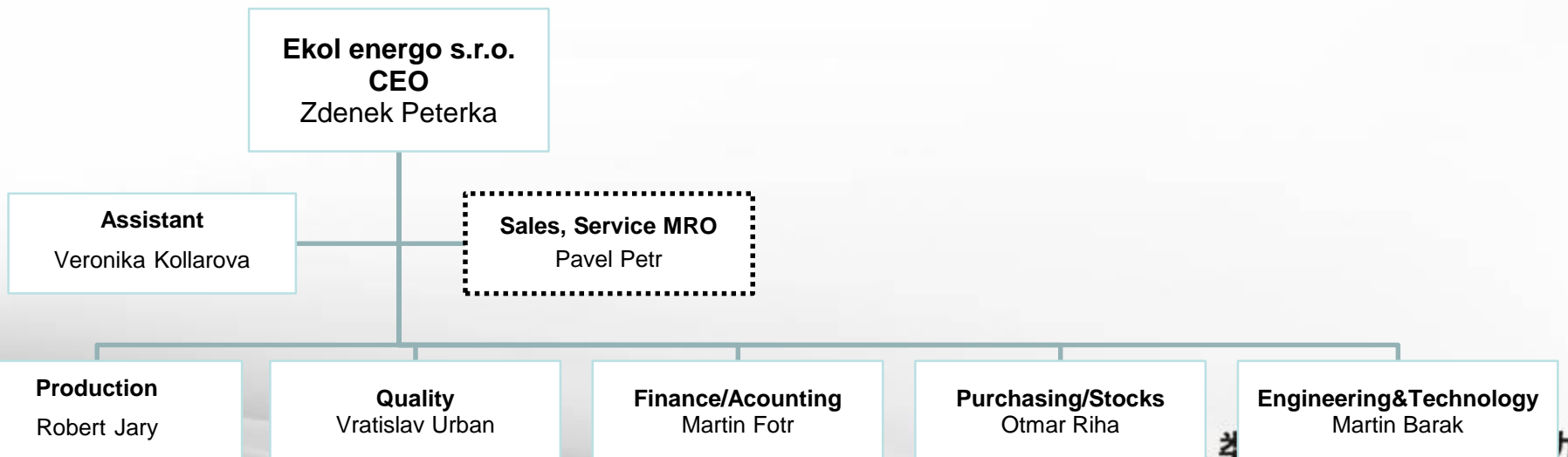
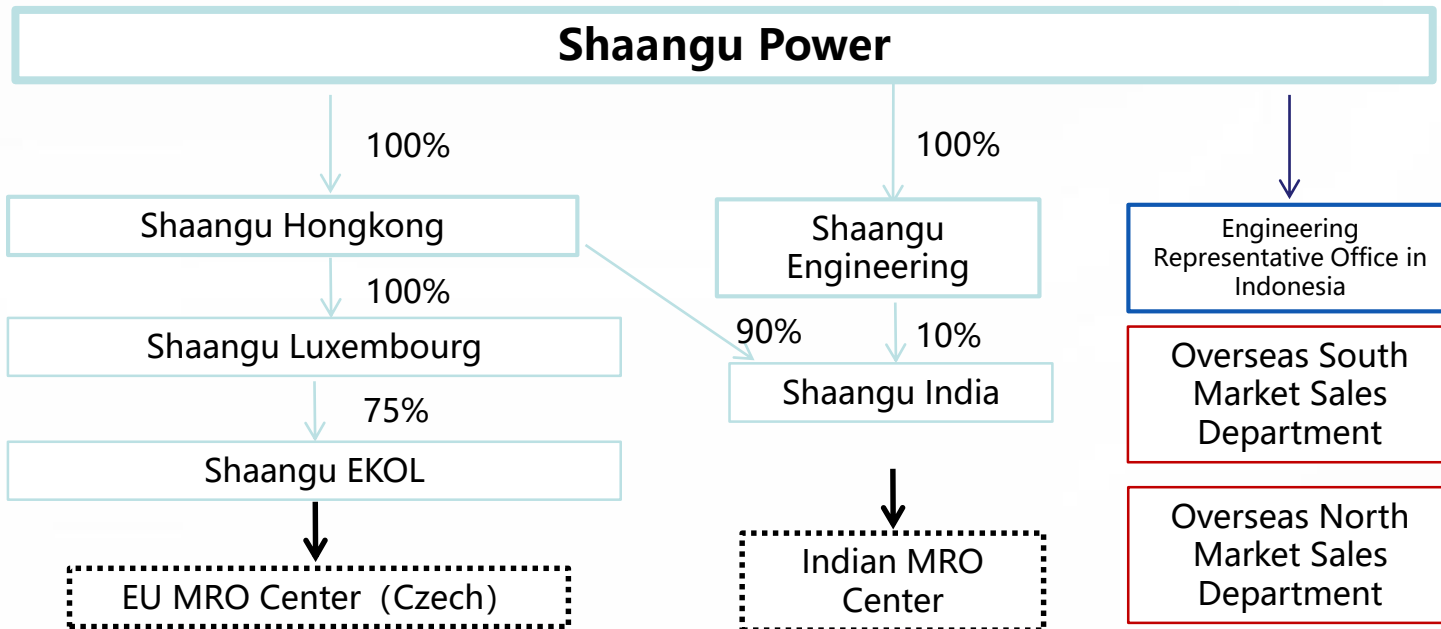
2.1 Our Service Goal

- Health management system for whole life cycle of all equipments in whole plant



Smart & Professional Solutions- “Healthy” Management System- “Intelligent” Housekeeping

2.2 Organizational Structure



2.2 Organizational Structure

- Setup of European MRO Center – 17.5.2017
 - Strategic goals:
 - Global visibility of brand ShaanGu
 - Fulfilment of requirements of customers on the European market
 - Integration of sources ShaanGu and EKOL



2.2 Organizational Structure



MRO is mainly focused on:

- Service and maintenance of steam turbines and compressors,
- Reconstruction, modernization and repairs of combustion turbines
- Deliveries of new combustion turbines as a substitute of no longer functioning or morally outdated combustion turbines
- Service maintenance of steam or hot water boilers
- Deliveries of new steam or hot-water boilers as a substitute for no longer functioning or morally outdated boilers
- Service maintenance of all EKOL EPC projects equipment (fuel management, boiler room, turbine machine, power output own power, automatic control system),
- Customer service

2.4 Service Facilities



2.4 Service Facilities(CN)

The Dedicated Repairing Workshop& Standardized Warehouse



The dedicated repairing workshop with area of 3000 m² and Standardized storage facilities for spare parts, fixed asset of 48 million RMB in System Services Division.

2.4 Service Facilities(CN)

4m CNC vertical lathe



12m CNC horizontal lathe



NC blade milling



Five-axis blade machining center



32t high-speed dynamic balancing machine



impeller over-speed testing



2.4 Service Facilities(EU)

Office space

1.500 m²

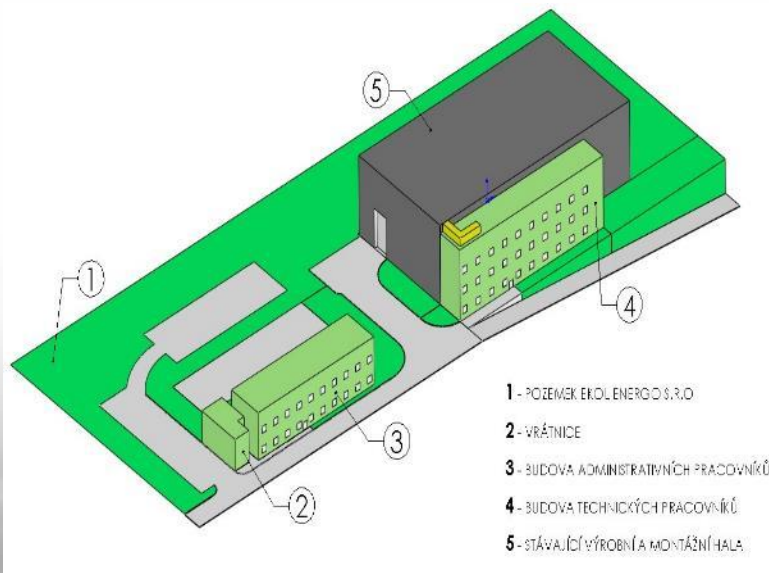
Production

workshop hall

3.700 m²

outer storage space

500 m²



Currently installed cranes

- two crane tracks, each track with two cranes, each crane with load capacity of 25 000kg (main lift) and 8000kg (auxiliary lift)
- crane travel: big hook 7m from the floor, small hook 7,3m from the floor
- hall height from floor till beams above the crane tracks 11m

Production hall – Door size

- width 5m
- height 5,5m

2.4 Service Facilities(EU)

Skoda SR1 Universal lathe



Max. length 8m, weight 25,000kg

Double main gantry milling machine



Max. 6.5×3×2.3m, weight 25,000kg

CNC horizontal boring machine



Max. 5×2.5×2m, weight 12,000kg

SAU 125/6000 CNC Universal lathe



Max. length 6m, weight 8,000kg

SKI 16 CNC boring & lathe



Max. height 1.35m, weight 12,000kg

Haas VM3 Vertical lathe



Max. 1,372×635mm,
weight 1,800kg

2.4 Global Marketing

Global Sales and Service Network



Global Service: China, Russia, Germany, South Korea, America, Brazil, India, Turkey, Vietnam ,etc., more than 400 sets achievements.

2.5 Industrial Service

Basic Service	Value-added Service	Spares Service	System Energy Saving	Specialist Service
<ul style="list-style-type: none">• Turbo-machine MRO activities• Installation& commissioning service• Reconstruction service• EPC	<ul style="list-style-type: none">• Specialize package service.• Second-hand machine service.• Remote on-line monitoring& fault diagnosis• Vibration issue troubleshooting & solution	<ul style="list-style-type: none">• Common spare parts service• Spare-parts inventory management	<ul style="list-style-type: none">• Compressor frequency conversion technology• De-humidity for blower system energy saving technology• EPU optimization• Residual heat power generation technology	<ul style="list-style-type: none">• Rotor high speed balancing testing• Specialized lube oil for turbo machine• Reversal designing

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Classic Service Cases



➤3.1 New Machine Service

➤3.2 Repair Service

➤3.3 Maintenance Solution

➤3.4 System Energy Saving

➤3.5 Long Term Contracts

3.1 Classic Case For New Machine Service

— Installation & Commissioning



TRT for 5200m³ Blast Furnace in Hyundai Steel, South Korea



- TRT for 4019m³ Blast Furnace in TATA Steel, India



3.1 Classic Case For New Machine Service

— Installation & Commissioning

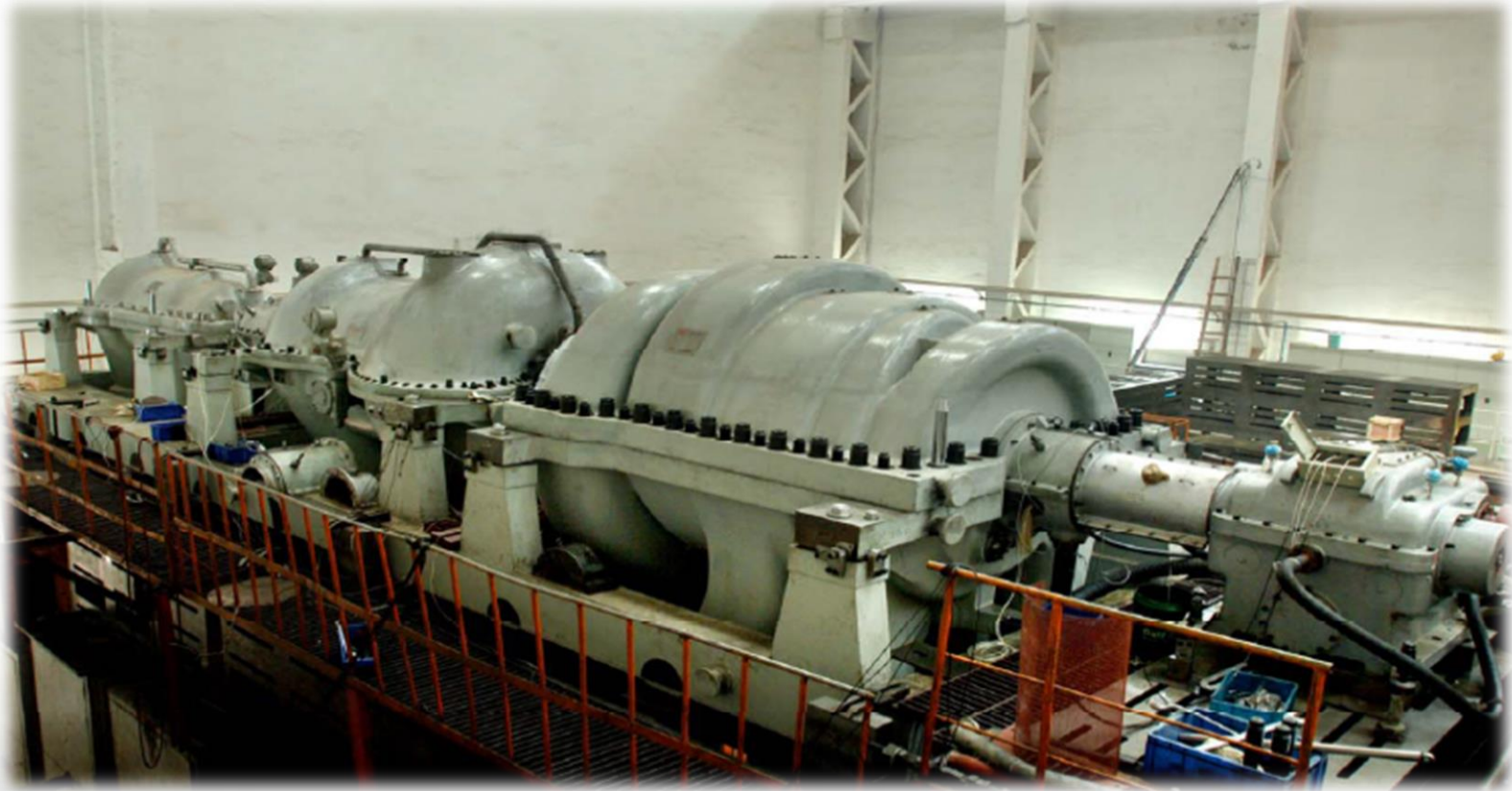
Gas station for 150MW Power Plant,
Bangladesh



3.1 Classic Case For New Machine Service

— Installation & Commissioning

PTA reference plant 600KT/a, China



3.1 Classic Case For New Machine Service

— Installation & Commissioning



Propane Refrigeration Compressor
EBS45-2+3 for South Pars Fields, Iran

From 2012 till now, more than 190 sets machine Installations has been executed, including 38 machine trains for overseas customer.



3.2 Classic Case For Repair Service



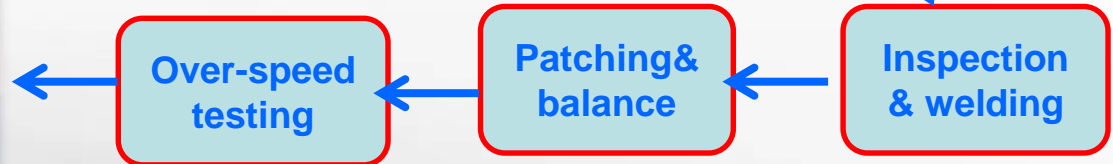
Impeller crack
2mm,
length
is 40mm

Impeller repairing for Atlas
multiple spindle compressor

Over-speed
testing

Patching &
balance

Inspection
& welding



3.2 Classic Case For Repair Service

Blade repairing for IHI mixed flow compressor



3.2 Classic Case For Repair Service

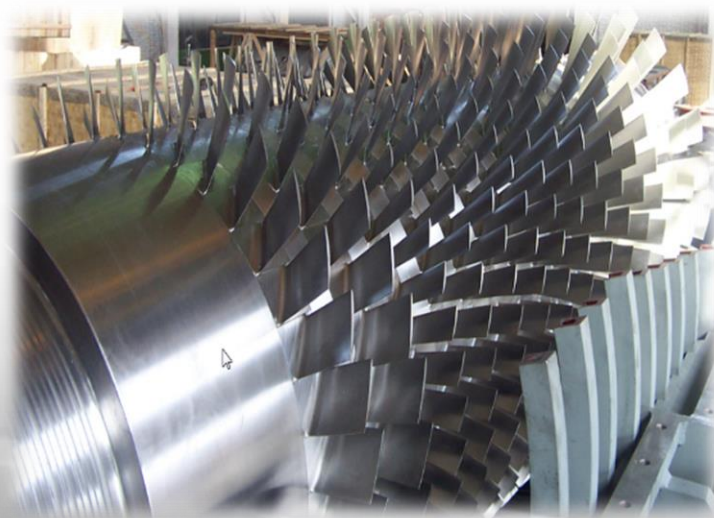


New rotor manufacture for Man-turbo axial compressor

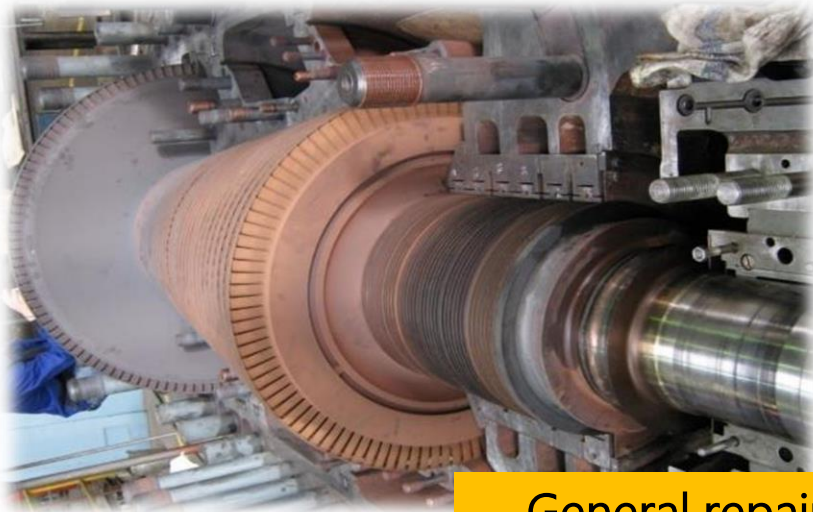
Customer asked
ShaanGu to reverse
design new rotor

reversal
designing

ShaanGu
manufacture,
erection &
commissioning

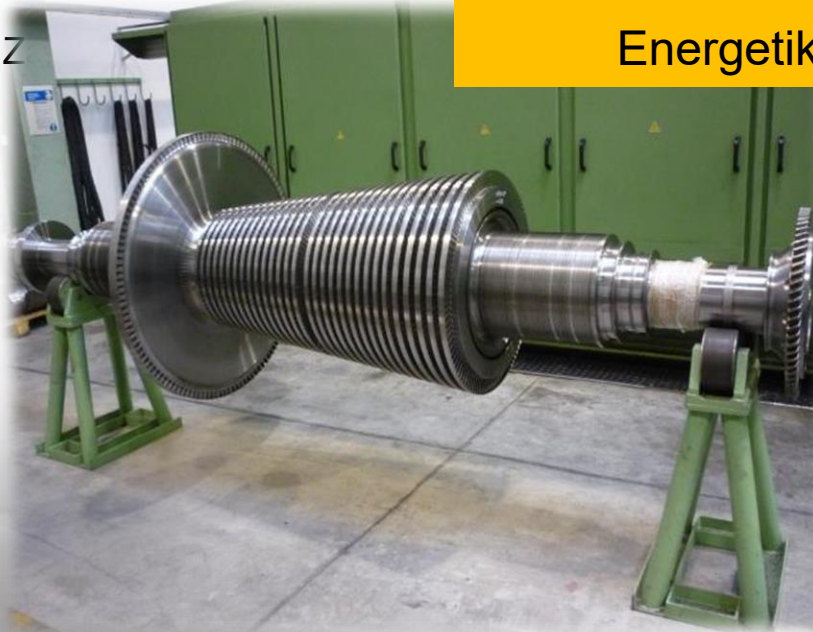


3.2 Classic Case For Repair Service

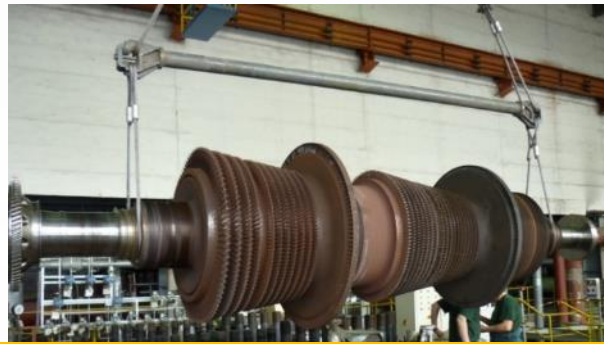


General repair of Steam turbine

Energetika Třinec (CZ)

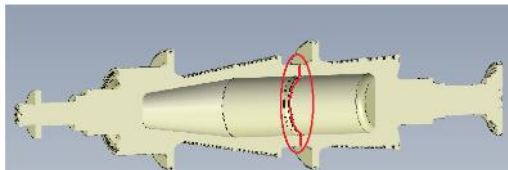
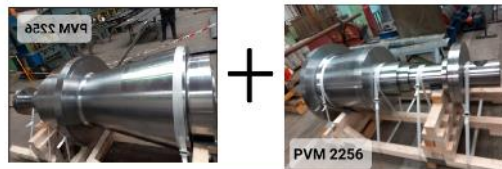


3.2 Classic Case For Repair Service



General repair of Steam turbine
(New Welded Rotor)

Žilina PBS 25 MW (SK)

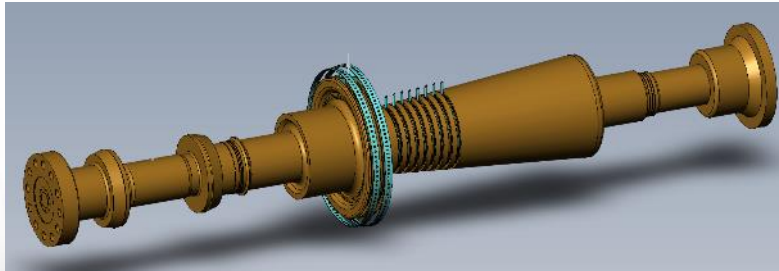


3.2 Classic Case For Repair Service



Steam Turbine Overhaul
(New Welded Rotor)

Grupa Azoty PBS 15 MW (PL)



3.3 Classic Case For Maintenance Solution

—Package Service

Compressor and TRT System solution for **Ningbo Steel**
(On-site Service, 24h x 7d):

- Repair, Maintenance
- Spare Parts
- Remote Online Monitoring



Compressor System solution for **Anshan Steel**

- Repair, Maintenance
- Spare Parts,
- Remote Online Monitoring

From 2014 till now, more than 20 projects executed for Package Service Solution.

3.3 Classic Case For Maintenance Solution

—Package Service

	Recommendation for steam turbine service		
Repair	Routine	Medium	General
Period	every 1-2 years	every 3-5 years	10-15 years
Operating hours	about 5-8.000	about 30-50.000	about 100-150.000 hours
Inspected parts	Bearing pedestals Oil system and accessories Control valves and emergency stop valves Inspection report with recommendation of next works	Routine repair + NDT of flow space, complete inspection Repair of bearings, parts of control and stop valves, governors Repair of oil and steam glands, new connecting material and seals	Medium repair + Reblading of stator and rotor Complete inspection and measurement Changing most of parts for news
Prediction of time for realization service works	about 1 week	4-6 weeks	8 weeks +

3.4 Classic Case For System Energy Saving

— Reconstruction & Modernization

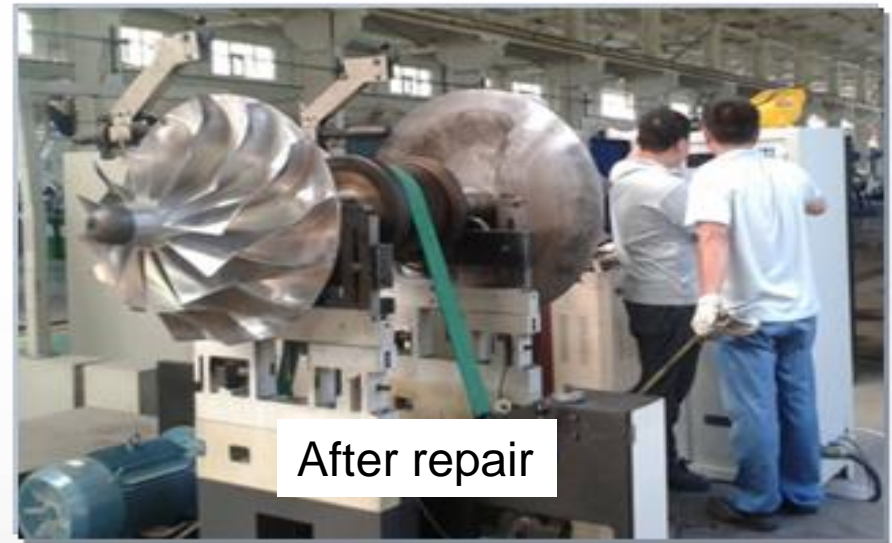
Compressor reconstruction
-Laser cladding



3.4 Classic Case For System Energy Saving

— Reconstruction & Modernization

Compressor reconstruction
-3D printing



3.4 Classic Case For System Energy Saving

— Reconstruction & Modernization

Modification of condensing turbine 33 MW to back pressure turbine 25 MW

- Repair of generator, oil accessories
- New control system
- New steam pipelines
- Required min. power after repair was 25 MW power, real output power after repair was 27,5 MW



SYNTHOS Kralupy (CZ)
PBS 33 MW to 25 (27,5)MW



3.4 Classic Case For System Energy Saving

— Reconstruction & Modernization

Reconstruction of steam turbine
Siemens 3,9 MW to Egypt

- Complet new rotor
- New stator blades
- New bearings
- Repair of turbine cases



— 3.5 Classic Case For Long Term maintenance Contracts —

Duslo Šala (SK)



Lovochemie (CZ)



一个开放的陕鼓期待与您携手并进

**Open minded ShaanGu awaits to join hands with
you to evolve together!**

Thank You!



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