Focus on Steam Generators – POWERing ahead together

Capital Markets Day “Power Services“ at Moorburg Power Plant

December 2, 2010

Gerd Lesser, CEO of BB Power Services GmbH
## Agenda

1. Competences and portfolio

2. Contract structure
   - 2.1 Definition
   - 2.2 References

3. Value added
   - 3.1 Workshops and capacities
   - 3.2 Assembly capacities

4. Market structure
   - 4.1 Main competitors
   - 4.2 Main customers

5. New technologies / R&D activities

6. Business philosophy
1. Competences and portfolio

Steam Generators

Bilfinger Berger SE

Bilfinger Berger Power Services GmbH

Steam Generators

- Babcock Borsig Service GmbH
- Steinmüller Instandsetzung Kraftwerke Gesellschaft für Energie- und Umwelttechnik mbH
- Deutsche Babcock Middle East FZE (VAE)
- Duro Dakovic Montaza d.d. (Kroatien)
- Rotring Engineering AG

Steinmüller Africa (Pty) Ltd.
Steinmüller Engineering Services (Pty) Ltd.
KOG Gruppe
Intervalve (Pty) Ltd.

Bilfinger Berger Power Holdings (Pty) Ltd.

Energy and Environmental Engineering

- Steinmüller Instandsetzung Kraftwerke Gesellschaft für Energie- und Umwelttechnik mbH

Piping Technology

- Steinmüller Africa (Pty) Ltd.
- KOG Gruppe
- Intervale (Pty) Ltd. 50%

Babcock Noell GmbH

BHR Hochdruck-Rohrleitungsbau GmbH
PKB Planungsbüro Rohrleitungs- und Anlagentechnik GmbH
BHR Piping Systems (Pty) Ltd. (Südafrika)
MCE Berlin GmbH

Mechanical Apparatus and Plant Engineering

- BHR Hochdruck-Rohrleitungsbau GmbH & Co. KG (Österreich)
- MCE Maschinen- und Apparatebau GmbH & Co. KG (Österreich)
- MCE Industrietechnik Aschersleben GmbH

Bilfinger Berger Capital Markets Day        December 2, 2010
1. Competences and portfolio
Development and volume forecast for Steam Generators

Orders received

Output volume

In € million

Bilfinger Berger Capital Markets Day December 2, 2010
1. Competences and portfolio
Overview of fossil-fuel power generation

- Steam Turbine
- Reheater
- Generator
- Steam Generator
- Feed Water System
- Condenser
- Cooling tower
- DeNOx - SCR
- Firing System for Hardcoal, Lignite, Oil and Gas
- Pre Air Heater
- Forced Draft Fan
- E-Filter
- Induced Draft Fan
- Flue Gas Desulfurization Plant
- Chimney
- Ash Containment
- Ash Removal
- Ash Removal
- Heat utilization systems
- Flue Gas Defulfurizing Plant
- Bilfinger Berger Capital Markets Day
  December 2, 2010
1. Competences and portfolio
Activities in the power plant sector

- Service range
  - Project management
  - Basic Engineering (Process engineering, E/I&C, Arrangement planning)
  - Detail engineering
  - Manufacturing, Fabrication
  - Steel construction, manlifts, facades, hoists
  - Construction, Erection
  - Quality assurance, welding technology
  - Commissioning, Bringing into operation
  - Procurement

- Planning teams
  - Steam generator, firing system
  - Components: coaling, mill, ash removal, heat recovery
  - Piping HP system, IP system, LP system
  - DeNOx Electrostatic precipitator, Desulfurization, Induced draft fan, Forced draft fan
  - Construction services (Bilfinger Berger Civil)
1. Competences and portfolio
Service range

- Steam Generators & Pressure Parts
- Oil-Gas Firing, Coal Firing Systems
- Coal Mills
- Coal Handling and Ash Removal Systems
- Heat Reclaimers
- Valves Flow Measurements
- Electrical and I & C
1. Competences and portfolio
Low-emission oil and gas burner (ADS burner)

Further development of the oil and gas burner at a test station and through numerical simulation. Nox reduction rates of up to 70 %.

Kallo Power Plant, Belgium: reduction of NOx from 700 mg/Nm³ to < 200 mg/Nm³.
1. Competences and portfolio

Coal mills

New development of the coal mill (BBS) together with the Russian company Tyazhmash (Syzran) as well as a newly patented (BBS) separator (for use in Zolling Power Plant and others).

Installation in the Voerde Power Plant

Technical data:

- 100 t/h coal, grinding 5% to 90 µm filter
- Hot air temperature carrying gas 320°C
- Separator temperature 85°C
- Pressure surge resistance 3.5 bar
- Service life wear parts > 20,000h
2. Contract structure
2.1 Definition

Projects
Complex orders consisting of engineering, delivery and assembly, including process technology risks.

Service
Contracts with fixed periods and order volume. The difference to the project business is the lack of involvement from the process technology engineering capacities. Examples include planned turnarounds.

Framework agreements
Long-term (1-10 years) service contracts. Service delivery is on demand (no purchase commitment). Invoicing based on time and expenses as well as according to special prices or catalogue prices.

Delivery and spare parts business
Delivery of spare parts for older facilities from the Babcock and Steinmüller history (1:1 delivery of components based primarily on existing parts lists and drawings).
2. Contract structure
2.2 Reference: Project
Power plant Belchatow, Poland

Client
PGE Elektrownia Belchatow

Period
2007 – 2011

Scope
- Modernisation Boiler 3
- Modernisation Boiler 4
- Modernisation Boiler 5
2. Contract structure
2.2 Reference: Service
Heavy oil power stations Cordemais / Aramon, France

Client
EdF

Period
2005 – 2008

Size
Approximately € 10m

Scope
- Refurbishment of pressure part, oil burners, ducts and air heaters incl. insulation for service life extension by another 10 years after an operating time of 25 years.
2. Contract structure
2.2 Reference: Long term services
Power plant Jänschwalde

<table>
<thead>
<tr>
<th><strong>Client</strong></th>
<th>Vattenfall Europe</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Period</strong></td>
<td>3 Years</td>
</tr>
<tr>
<td><strong>Size</strong></td>
<td>Approximately € 20m</td>
</tr>
<tr>
<td><strong>Scope</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Mill service in abrasive process</td>
</tr>
</tbody>
</table>
### 2. Contract structure

#### 2.2 Reference: Delivery

**Fabrication of boiler components Pretoria, South Africa**

<table>
<thead>
<tr>
<th><strong>Client</strong></th>
<th>Hitachi Power Africa</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Period</strong></td>
<td>2009 – 2014</td>
</tr>
<tr>
<td><strong>Size</strong></td>
<td>Approximately € 90m</td>
</tr>
<tr>
<td><strong>Scope</strong></td>
<td>Manufacture for new Power Plants Medupi and Kusile (12 x 750 MW)</td>
</tr>
<tr>
<td></td>
<td>- Coils</td>
</tr>
<tr>
<td></td>
<td>- Membrane walls</td>
</tr>
<tr>
<td></td>
<td>- Headers</td>
</tr>
</tbody>
</table>
3. Value added
3.1 Workshops and product manufacturing

Sites and capacities

<table>
<thead>
<tr>
<th>Company</th>
<th>Employees</th>
<th>Square footage ($^2$)</th>
<th>Manufacturing Capacity (h/a)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bilfinger Berger Power Holdings (Pty) Ltd. Steinmüller Africa, Pretoria</td>
<td>430</td>
<td>115,300</td>
<td>870,000</td>
</tr>
<tr>
<td>Babcock Fertigungszentrum GmbH, Oberhausen 50% shareholding</td>
<td>130</td>
<td>16,000</td>
<td>200,000</td>
</tr>
<tr>
<td>Heatec Co., Ltd. / Thailand, Laemchabang</td>
<td>63</td>
<td>7,525</td>
<td>110,000</td>
</tr>
<tr>
<td>Steinmüller Instandsetzung Kraftwerke GmbH, Jänschwalde</td>
<td>50</td>
<td>16,000</td>
<td>100,000</td>
</tr>
<tr>
<td>Babcock Borsig Service GmbH, St. Ingbert</td>
<td>26</td>
<td>4,500</td>
<td>40,000</td>
</tr>
<tr>
<td>Đuro Đaković Montaža d.d., Slavonski Brod 81% shareholding</td>
<td>120</td>
<td>14,436</td>
<td>260,000</td>
</tr>
<tr>
<td><strong>Total manufacturing capacity</strong></td>
<td><strong>819</strong></td>
<td><strong>173,761</strong></td>
<td><strong>1,580,000</strong></td>
</tr>
</tbody>
</table>
### 3. Value added
#### 3.2 Assembly capacities

<table>
<thead>
<tr>
<th>Location</th>
<th>Internal personnel</th>
<th>External personnel</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Germany</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Steam generators, components</td>
<td>1,850,000 h/a</td>
<td></td>
</tr>
<tr>
<td><strong>Croatia &amp; Europe</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Steam generators and industrial plants, environmental technology, components</td>
<td>500,000 h/a</td>
<td></td>
</tr>
<tr>
<td><strong>South Africa</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Steam generators, components</td>
<td>1,150,000 h/a</td>
<td>4,000,000 h/a</td>
</tr>
<tr>
<td><strong>Gulf region</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stream generators, components, pipings</td>
<td>600,000 h/a</td>
<td>4,500,000 h/a</td>
</tr>
<tr>
<td><strong>Total assembly capacity</strong></td>
<td>4,100,000 h/a</td>
<td>8,500,000 h/a</td>
</tr>
</tbody>
</table>
4. Market structure
4.1 Main competitors

<table>
<thead>
<tr>
<th>Projects</th>
<th>Alstom</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Hitachi Power Europe</td>
</tr>
<tr>
<td></td>
<td>AE&amp;E</td>
</tr>
<tr>
<td></td>
<td>Doosan</td>
</tr>
<tr>
<td></td>
<td>Ansaldo</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Services / Long-term services</th>
<th>Alstom</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>E.On Anlagenservice</td>
</tr>
<tr>
<td></td>
<td>Balcke-Dürr Service</td>
</tr>
<tr>
<td></td>
<td>ThyssenKrupp Xervon (LLS)</td>
</tr>
<tr>
<td></td>
<td>Doosan</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Delivery and spare parts business</th>
<th>Alstom</th>
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<td></td>
<td>Hitachi Power Europe</td>
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<tr>
<td></td>
<td>Doosan</td>
</tr>
</tbody>
</table>
4. Market structure
4.2 Main customers
5. New technologies / R&D activities

- Participation in R & D Projects
  - Micro gas turbine and PowerBlock - BTU Cottbus / BBPS
  - Marcko 700- new materials for 700 °C power plant
  - Examination and testing of new materials FDBR / VGB
  - Development of a steam pressure fluidized bed drying of lignite - pilot stage
  - Development of an FGD with extremely high precipitator efficiency for oxyfuel power plant - pilot stage

- Further developments of components and processes
  - Concept development for dried lignite / brown coal (TBK) steam generators
  - Oxyfuel concept development for steam generator based on lignite
  - Welding procedures for new materials and large wall thicknesses
  - Low-NOx Oil /Gas / pulverized coal Burner
  - New materials for pulverized coal Burner - less wear, improved temperature resistance and stability
  - Rollers for coal mill
  - Classifier with improved selectivity

- Innovative future technologies – CCS (Carbon capture and storage)
  - Pre-combustion capture – Oxyfuel-combustion
  - Post-combustion capture – CO₂-scrubbing
5. New technologies / R&D activities
Reference: DDWT pilot plant Schwarze Pumpe

Client
Vattenfall Europe

Period
2007 – 2010

Scope

- Realisation of and participation in trial operation of a plant for the pressurised steam fluidised bed drying (PFBD) of lignite
6. Business philosophy

- Service based on up-to-date engineering know-how
- High level of own value added (engineering, manufacturing, delivery, assembly)
- Strict and high quality assurance standards

⇒ Strong reputation and confidence with regard to quality and schedules
⇒ Own capacities: Even when we cooperate with other (e.g. local) companies, we can fully control the processes (quality review) with our own personnel, or, if needed, we can fulfill the contract ourselves.
Strong arguments for efficiency increase in power plants!

Thank you for your attention!