MHI Gas Turbine Business Presentation

GTCC Business Report and Strategic Goals

September 12, 2005
Mitsubishi Heavy Industries, Ltd.
Ichiro Fukue
Executive Vice President & Representative Director General Manager, Power Systems Headquarters
Positioning of the Power Systems Segment
Power Systems Share of Total Orders and Sales

FY04 Consolidated Orders Received

¥691.4billion
Total: ¥2,722.8 billion

FY04 Consolidated Net Sales

¥629.6billion
Total: ¥2,590.7 billion
Power Systems Consolidated Orders Received, Net Sales, Operating Income and R&D Expenditures

(\text{billion yen})
Major Products of the Power Systems Segment

**Power Systems**

Thermal power plant (GTCC/conventional)
- Steam turbines, Gas turbines, Boilers
- Selective Catalytic NO\textsubscript{x} Removal System

Renewable energy
- Wind, Hydro, Geothermal, Solar power plant

Diesel engines  Marine engines  Fuel cells

**Nuclear Power**

- PWR Power Plants
- New boiler plant type power plant
- Nuclear fuel
- Nuclear Fuel Cycle Equipments

Composition of FY04 Orders
Received (Power Systems)
The Gas Turbine Business
Global Orders for Gas Turbines by Category

Average Market Share Over Past Three Years (2002-2004)

[Target] Market Share of 20%

- Due to surge in U.S. demand
- Due to surge in Chinese demand

Order volumes (MW)

- Large
- Medium
- Small

Each bar represents a different category (Large, Medium, Small), and the bars are color-coded to indicate market share for each category.
Gas Turbine Deliveries by Region

As of June 2005

**Europe and Middle East**
- Netherlands 1
- Slovakia 2
- Iran 11
- Kuwait 4
- Qatar 6
- Algeria 6
- Egypt 2
- Saudi Arabia 26
- U.A.E. 6
- Pakistan 1
- U.K. 13
- Ireland 1
- Spain 7

**Americas**
- Brazil 2
- Peru 3
- Chile 2
- Argentina 5

**Southeast Asia**
- Thailand 18
- Singapore 4
- Indonesia 21
- Vietnam 3
- Malaysia 3
- China 16
- India 10
- Macao 3
- Mozambique 1

**Japan**
- Japan 150
- Hong Kong 7
- Taiwan 22
- Philippines 7

**Total**

- **M501G** 29
- **M701G** 7
- **Total**: 36 units

- **M501F** 61
- **M701F** 69
- **Total**: 130 units

- **M501D** 17
- **M701D** 79
- **Total**: 96 units

- **TOTAL**: 450 units
continuously received several orders for large combined-cycle projects

<table>
<thead>
<tr>
<th>Customer</th>
<th>Project</th>
<th>Turbines</th>
<th>Output</th>
<th>Completion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tohoku Electric Power</td>
<td>Higashi-Niigata 4-2</td>
<td>M701G 2</td>
<td>805MW</td>
<td>2008</td>
</tr>
<tr>
<td>Tokyo Electric Power</td>
<td>Kawasaki No. 1</td>
<td>M701G2 3</td>
<td>1,500MW</td>
<td>2007</td>
</tr>
<tr>
<td>Kawasaki Natural Gas Generation</td>
<td>Kawasaki Natural Gas</td>
<td>M701F 2</td>
<td>800MW</td>
<td>2008</td>
</tr>
</tbody>
</table>
Captured large volume of orders through bulk-negotiations

The sole provider in China of CC generators fueled by blast furnace exhaust gas

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<tr>
<td>Beijing No. 3</td>
<td>M701F</td>
<td>272MW</td>
<td>2005</td>
</tr>
<tr>
<td>Shenzhen Qianwan</td>
<td>M701F</td>
<td>735MW</td>
<td>2006~7</td>
</tr>
<tr>
<td>Huizhou LNG</td>
<td>M701F</td>
<td>735MW</td>
<td>2006~7</td>
</tr>
<tr>
<td>Shenzhen Eastern</td>
<td>M701F</td>
<td>735MW</td>
<td>2006~7</td>
</tr>
<tr>
<td>Jiangsu Shagang</td>
<td>M251S</td>
<td>60MW</td>
<td>2005~6</td>
</tr>
<tr>
<td>Handan</td>
<td>M251S</td>
<td>60MW</td>
<td>2006</td>
</tr>
<tr>
<td>Anshan</td>
<td>M701F</td>
<td>300MW</td>
<td>2007</td>
</tr>
<tr>
<td>Maanshan</td>
<td>M701DA</td>
<td>153MW</td>
<td>2007</td>
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</table>

Total orders: 16 turbines
(as of September 1, 2005)
Southeast Asia

About 14 GW orders are expected over the next five years

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</thead>
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<tr>
<td>Taiwan</td>
<td>TPC</td>
<td>Dah-tarn</td>
<td>M501F x 6, M501G x 8</td>
<td>4,272MW</td>
<td>2005-2008</td>
</tr>
<tr>
<td>Korea</td>
<td>KDHC</td>
<td>Hwaseong</td>
<td>M501F x 2</td>
<td>800MW</td>
<td>2007</td>
</tr>
<tr>
<td>Korea</td>
<td>POSCO</td>
<td>Pohang</td>
<td>M501DA x 1</td>
<td>145MW</td>
<td>2007</td>
</tr>
<tr>
<td>Thailand</td>
<td>RPC</td>
<td>Ratchaburi</td>
<td>M701F x 4</td>
<td>1,400MW</td>
<td>2008</td>
</tr>
<tr>
<td>Indonesia</td>
<td>PLN</td>
<td>Cilegon</td>
<td>M701F x 2</td>
<td>700MW</td>
<td>2005</td>
</tr>
</tbody>
</table>

Deliveries by country:
- Taiwan: 22
- Korea: 3
- Vietnam: 3
- Malaysia: 3
- Singapore: 4
- Thailand: 18
- Indonesia: 21

Southeast Asia

Southeast Asia

Southeast Asia
Enhanced presence in this region by expanding the function of the existing local base

Prepared for a recovery in demand in North America

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<tr>
<td>U.S.</td>
<td>Portland GE</td>
<td>Port Westward</td>
<td>M501G 1</td>
<td>400MW</td>
<td>2007</td>
</tr>
<tr>
<td>Mexico</td>
<td>Mitsubishi Corp.</td>
<td>Tuxpan V</td>
<td>M501F 2</td>
<td>495MW</td>
<td>2006</td>
</tr>
<tr>
<td>Chile</td>
<td>ENDESA</td>
<td>San Isidro</td>
<td>M701F 1</td>
<td>377MW</td>
<td>2008</td>
</tr>
</tbody>
</table>
Enhanced presence in this region by establishing more local bases

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<tr>
<td>Spain</td>
<td>Electrabel</td>
<td>Castelnou</td>
<td>M701F □2</td>
<td>800MW</td>
<td>2006</td>
</tr>
<tr>
<td>Spain</td>
<td>AES</td>
<td>Cartagena</td>
<td>M701F □3</td>
<td>1,200MW</td>
<td>2006</td>
</tr>
<tr>
<td>Spain</td>
<td>ENDESA</td>
<td>Cristobal Colon</td>
<td>M701F □1</td>
<td>400MW</td>
<td>2006</td>
</tr>
<tr>
<td>Saudi Arabia</td>
<td>ARAMCO</td>
<td>Berri</td>
<td>M501F □2</td>
<td>300MW</td>
<td>2005</td>
</tr>
</tbody>
</table>
Strategies for Gas Turbine Business

- Business model
  - Increase full turnkey and service businesses

- Development of technologies
  - Refine technologies for higher efficiency and the fuel flexibility capability

- Regional strategy
  - Use overseas bases to increase the scale of operations
The MHI GTCC Business Model

Specialize in large GT (F/G type) to maximize efficiency of business operations

Maintain consistent volume of business through suitable volume of full turnkey orders

Order Composition

Full turnkey

Services

Stand-alone equipment

< Summary of full turnkey price structure >

Gas turbine
ST, HRSG generator
Site preparation, installation, trial operations

Maintain consistent earnings through growth in turbines serviced by MHI and long-term service agreements

- More long-term service agreements
- Provide servicing for gas turbines of other companies

< Projected Growth in Gas Turbines Serviced >

Gresik power plant in Indonesia

GTCC - Gas Turbine Combined Cycle
FTK - Site preparation, installation, trial operations and delivery
Increase Sales by Offering Exclusive Technologies
GTCC fueled by blast furnace exhaust gas

Blast furnace exhaust gas: A low-calorie (about one-tenth of natural gas) generated as a byproduct of the steelmaking process during the reduction reaction of iron ore and coke

150MW class (about 50 meters)
300MW class (about 60 meters)

World’s largest blast furnace/coke oven gas GTCC (using M701F) Kimitsu Cooperative Thermal Power (began operations in 2004)

Strategic sales promotion by focusing on Asia

Steady Growth in Orders Received

(Source: MHI forecast)
Extensive Use of Fuel Flexibility Technology
Coal and Petroleum IGCC

Compatible with any gasification system

**Nippon Oil Negishi** (Vacuum Residue IGCC)
Completed in 2003

*Vacume Residue = Vacuum residue gasification

Use Japanese technology in other countries

**Jyoban Karyoku, Nakoso Power Plant IGCC Prototype**
Slated for completion in 2007

Petroleum IGCC
Coal IGCC
Fuel flexibility technology

Cross section of power train

**GEN. ST GT (M701F)**
**HRSG**

**Completed in 2003**

**Slated for completion in 2007**
MPS (Mitsubishi Power Systems)

Objective
Provide total activities including sales, engineering, project management and service for MHI fleet to expand the business in the U.S. power market.

Profile
• Established: April 2001
• Activities: Repair of Hot gas path parts, Remote monitoring of operating plants, field services for gas and steam turbines.
• Employees: 337 (as of July 31, 2005)

Head Office of MPS

OSC (Orlando Service Center)
Guangzhou Joint Venture (Mitsubishi Heavy Industries Dongfang Gas Turbine (Guangzhou) Co., Ltd.)

**Objective**

Participate in the bulk gas turbine projects and establish the local production capability to enter the power market in China

- **Established**: July 2004 (receipt of government approval)
- **Inauguration**: September 9, 2005
- **Activities**: Sales, Manufacturing and repair of core components of gas turbines
- **Share holders**: MHI (51%), Dongfang Steam Turbine Works (49%)
- **Employees**: 94 (including 72 in manufacturing dept.)
The F Revolution — A Campaign to Increase Productivity

MHI is conducting a campaign aimed at higher quality and efficiency of manufacturing activities by returning to the basics of manufacturing.

**The Three F’s**
- **Flow**: Continuous flow processing
- **Fast**: Faster manufacturing and improvement speed
- **Fine**: Earning customer satisfaction by delivering fine quality

The F Revolution began in October 2001 with a numerous steady programs for production and development activities.

(The revolution is expanding into other factories of MHI and our business partners.)

**Achievement of Productivity**

$$\text{Productivity} = \frac{\text{Manufacturing productions}}{\text{Standard hours} \times \text{Work hours}}$$

- Gas turbine Blade & Vane
- Transition piece
- Combustor basket
- Small-size heat exchangers