Overview of General Machinery & Special Vehicle Headquarters Operations

July 6, 2006

General Machinery & Special Vehicle Headquarters
Positioning of General Machinery & Special Vehicle Headquarters (GMSVH) in MHI

◇ GMSVH has become the third largest headquarters after Power Systems and Aerospace in terms of both sales and profit.

◇ Going forward, GMSVH will pursue global expansion to maintain its position as one of MHI’s main pillars of profit.
Trends of GMSVH Operations

Characteristics

① Sales of engine turbochargers as a component have grown in recent years

② Aggressive overseas expansion and promotion of local production at overseas operating outposts
(Target ratio of non-consolidated earnings to consolidated earnings: 1.8 [Overall MHI: 1.2])

*Number of overseas operating outposts: 11
Overseas Expansion of GMSV

Export Sales by Region (Non-consolidated)

Outline of Overseas Operating Outposts

<table>
<thead>
<tr>
<th>Company name</th>
<th>MCFA</th>
<th>MENA</th>
<th>MEE</th>
<th>MCFE</th>
<th>MPM</th>
<th>MHIS</th>
<th>MCFS</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Location</td>
<td>Tulsa (US)</td>
<td>Chicago (US)</td>
<td>Almere (Netherlands)</td>
<td>Almere (Netherlands)</td>
<td>Bangkok (Thailand)</td>
<td>Singapore</td>
<td>Singapore</td>
<td></td>
</tr>
<tr>
<td>Established in</td>
<td>Jul-92</td>
<td>Apr-85</td>
<td>Apr-88</td>
<td>Jul-92</td>
<td>Dec-93</td>
<td>Jul-81</td>
<td>Jul-92</td>
<td></td>
</tr>
<tr>
<td>Number of employees</td>
<td>1,133</td>
<td>36</td>
<td>357</td>
<td>622</td>
<td>78</td>
<td>66</td>
<td>46</td>
<td>2,338</td>
</tr>
<tr>
<td>Sales in 2005 (Thousand millions of yen)</td>
<td>943</td>
<td>90</td>
<td>334</td>
<td>414</td>
<td>6</td>
<td>68</td>
<td>82</td>
<td>1,937</td>
</tr>
</tbody>
</table>

[Other overseas operating outposts other than the above 2: MEA(France) MHISV(Vietnam) MCFC(China) and Shanghai MHI Turbocharger Co., Ltd. (China)]
Forklift Trucks – Business Environment

Global Market Trends

<table>
<thead>
<tr>
<th>Year</th>
<th>Counter balance engine forklift trucks</th>
<th>Counter balance electric forklift trucks</th>
<th>Indoor materials handling equipment</th>
</tr>
</thead>
<tbody>
<tr>
<td>2000</td>
<td>571 (100%)</td>
<td>223 (100%)</td>
<td>235 (100%)</td>
</tr>
<tr>
<td>2001</td>
<td>322 (144%)</td>
<td>113 (100%)</td>
<td>286 (122%)</td>
</tr>
<tr>
<td>2002</td>
<td>289 (120%)</td>
<td>322 (127%)</td>
<td>276 (100%)</td>
</tr>
<tr>
<td>2003</td>
<td>340 (126%)</td>
<td>130 (115%)</td>
<td>267 (100%)</td>
</tr>
<tr>
<td>2004</td>
<td>738 (129%)</td>
<td>130 (115%)</td>
<td>267 (100%)</td>
</tr>
<tr>
<td>2005</td>
<td>382 (144%)</td>
<td>130 (115%)</td>
<td>267 (100%)</td>
</tr>
</tbody>
</table>

Market Trends

- Europe, the U.S. and Japan: cyclical demand in accordance with economic trend. China, Russia and India are growth markets.
- Expansion into emerging markets (Russia, South America and India)
- Ratio of electric forklift trucks is rising amid surging oil prices and rising environmental awareness.
- Demand for indoor materials handling equipment increased, reflecting greater distribution efficiency at plants and smaller distribution lots.

MHI’s Challenges

- Expansion in China (Expand diffusion models by means of technology licensing while start local production of new models.)
- Efforts to promote energy savings, fuel emission controls and other environmental technologies.
- Strengthen electronic forklift trucks for overseas markets. Enter the indoor materials handling equipment market.

Market Share (2005)

- MHI/MCF: 10%
- Toyota/BT: 24%
- Crown: 15%
- Linde: 21%
- Komatsu: 17%
- Nacco: 17%
- Nissan: 8%
- Jungheinrich: 15%
- Other: 17%

Indoor materials handling equipment
Forklift Trucks – Main Strategies

Efforts to continue growth in global markets by switching to total materials handling

**Actions aimed at switching to total materials handling**

**MHI’s Strengths**

1. All technologies needed are internally developed
   - Reflect MHI’s power system, control, IT/communication and environmental technologies in planning unique products
   - Controller (Electronic technology)
   - Engine (Environmental technology)
   - Transmission / axle
   - Distribution management technology

2. Global business operations
   - Global operations at four key regions (North America, Europe, Asia, Japan)
   - Deep understanding of global markets and distribution types are reflected in product sales
   - Japan operations play the role of control tower as the mother factory and design center

**Operations that keep growing**

**Trend of consolidated sales**

<table>
<thead>
<tr>
<th>Year</th>
<th>Overseas</th>
<th>Collaboration</th>
<th>Sales (Thousand millions of yen)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1987</td>
<td>220</td>
<td></td>
<td>860</td>
</tr>
<tr>
<td>1989</td>
<td>350</td>
<td></td>
<td>1,110</td>
</tr>
<tr>
<td>1991</td>
<td>380</td>
<td>MCF Counted</td>
<td>1,130</td>
</tr>
<tr>
<td>1993</td>
<td>860</td>
<td></td>
<td>1,100</td>
</tr>
<tr>
<td>1995</td>
<td></td>
<td></td>
<td>1,180</td>
</tr>
<tr>
<td>1997</td>
<td></td>
<td></td>
<td>1,210</td>
</tr>
<tr>
<td>2001</td>
<td></td>
<td></td>
<td>1,380</td>
</tr>
<tr>
<td>2003</td>
<td></td>
<td></td>
<td>1,743</td>
</tr>
<tr>
<td>2005</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2006</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2008</td>
<td></td>
<td></td>
<td>2,000</td>
</tr>
</tbody>
</table>

**MHI’s Strategies**

**Capture customer needs**

1. New businesses, new areas (New business models / rental, fleet management service, remanufacturing, used vehicles)
2. Expand into new countries (China, Russia, South America and India)
3. Explore new technologies (hybrid/fuel cell vehicles, indoor materials operation, etc.)

**Improve processes**

1. Improve quality of development and design
2. Improve quality of supply chains
3. Raise values of both CAT and Mitsubishi brands (2B2C)

**Achieve first-class quality**

1. Strengthen domestic sales by offering a full line of products (NIPPON YUSOKI CO., LTD.)
2. Broaden a product line of indoor distribution equipment for European markets (ROCLA)

**Collaboration strategies**

1. Collaboration with Nissan in core models
2. Tie-up with ROCCLA in indoor materials handling equipment business

**New businesses, new areas**

1. Establish MCF
2. Collaboration with Nissan in core models
3. Tie-up with ROCCLA in indoor materials handling equipment business

**Enhanced production in overseas market**

2008 Target: 2,000

**Operations that keep growing**

1. All technologies needed are internally developed
2. Reflect MHI’s power system, control, IT/communication and environmental technologies in planning unique products
3. Controller (Electronic technology)
4. Engine (Environmental technology)
5. Transmission / axle
6. Distribution management technology

**Actions aimed at switching to total materials handling**

1. Strengthen domestic sales by offering a full line of products (NIPPON YUSOKI CO., LTD.)
2. Broaden a product line of indoor distribution equipment for European markets (ROCLA)

**Efforts to continue growth in global markets by switching to total materials handling**

1. Improve quality of development and design
2. Improve quality of supply chains
3. Raise values of both CAT and Mitsubishi brands (2B2C)
**Market Trends**

- **In Europe,** the ratio of diesel engine vehicles increased following the tightening of environmental regulations. Also in China, U.S. and Asia, the market of diesel engine vehicles grew with more vehicles attached with turbocharger.

- **In Europe,** gasoline engines are getting smaller as they are equipped with turbochargers, thanks to greater efficiency in fuel and performance. Also in North America, there are moves to achieve greater power output by equipping the engine with a turbocharger instead of enlarging the engine itself.

- **Industrial machinery (construction/agricultural machinery/equipment):** Demand is increasing, reflecting more stringent exhaust emission regulations.

**MHI’s Challenges**

- **Develop next-generation turbochargers and promote solution business in response to demand increase reflecting a rising ratio of diesel engine cars in Europe.**

- **Increase market share by leveraging MHI’s strength of advanced gasoline engine turbochargers. North America is the target of strengthening operations going forward.**

- **Explore potential demand in industrial machinery, which is increasingly using turbochargers because of the tightening of emission regulations, based on actual data of MHI’s construction machinery equipped with turbochargers.**

**Market Share Trend**

MHI strengthened market influence with a 20% market share, the second biggest globally, gained by winning large project assignments from European carmakers through enhancement of enhancing solution business.

**Demand Trends**

(Unit: 10,000)

- **2003:** Europe - 135, Japan - 140, North America - 135, Korea Asia - 124, Other - 140
- **2004:** Europe - 160, Japan - 145, North America - 145, Korea Asia - 203, Other - 200
- **2005:** Europe - 225, Japan - 225, North America - 150, Korea Asia - 1769, Other - 1769
- **2006:** Europe - 140, Japan - 230, North America - 143, Korea Asia - 490, Other - 330

**Global Market Size**

- **2005:** 14.90 million turbochargers
- **2008:** 17.69 million turbochargers

**Market Share Trend**

- **2005:** MHI 17%, Borg Warner 21%, Honeywell 41%, IHI 12%, Other 9%
- **2008:** MHI 20%, Borg Warner 19%, Honeywell 39%, IHI 14%, Other 8%

**Turbochargers - Business Environment**

**Demand Trends**

<table>
<thead>
<tr>
<th>Year</th>
<th>Europe</th>
<th>Japan</th>
<th>North America</th>
<th>Korea Asia</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>2003</td>
<td>135</td>
<td>140</td>
<td>135</td>
<td>124</td>
<td>140</td>
</tr>
<tr>
<td>2004</td>
<td>160</td>
<td>145</td>
<td>145</td>
<td>203</td>
<td>200</td>
</tr>
<tr>
<td>2005</td>
<td>225</td>
<td>225</td>
<td>150</td>
<td>1769</td>
<td>1769</td>
</tr>
<tr>
<td>2006</td>
<td>140</td>
<td>230</td>
<td>143</td>
<td>490</td>
<td>330</td>
</tr>
</tbody>
</table>

**Volume of MHI production (by unit)**

- **2005:** Europe - 140, Japan - 225, North America - 250
- **2008:** Europe - 143, Japan - 225, North America - 360

**Global Market Size**

- **2005:** MHI 17%, Borg Warner 21%, Honeywell 41%, IHI 12%, Other 9%
- **2008:** MHI 20%, Borg Warner 19%, Honeywell 39%, IHI 14%, Other 8%
Turbochargers – Main Strategies

Leverage MHI’s strength as an engine manufacturer to expand scale in small size turbochargers for passenger car engines

**Sales by Type of Vehicle (Non-consolidated)**

(Thousand millions of yen)

<table>
<thead>
<tr>
<th>Year</th>
<th>Cars</th>
<th>Trucks</th>
<th>Industrial</th>
</tr>
</thead>
<tbody>
<tr>
<td>2004</td>
<td>252</td>
<td>50</td>
<td>18</td>
</tr>
<tr>
<td>2005</td>
<td>322</td>
<td>58</td>
<td>18</td>
</tr>
<tr>
<td>2006</td>
<td>316</td>
<td>60</td>
<td>23</td>
</tr>
<tr>
<td>2008</td>
<td>330</td>
<td>60</td>
<td>40</td>
</tr>
</tbody>
</table>

**Sales Ratio of Turbochargers by Region**

Sales in Europe and Asia grew sharply due to a greater ratio of diesel engine cars reflecting more stringent environmental regulations in Europe and a growth in the market of diesel engine vehicles in Asia. The challenge going forward is to strengthen North American operations.

**Efforts to Establish Global Operations Structure**

1. Beef up local production capacity of MEE (the Netherlands) and strengthen functions of local headquarters in Europe
2. Start full-scale operations in North America
3. Strengthen production in facilities in Asia (South Korea, Shanghai, Southeast Asia)

**Strengthen Competitiveness**

1. Expand solution business, in which MHI even performs examination on behalf of customers
2. Seize the opportunity of responding to emission regulations to expand in industrial machinery (fully leverage MHI’s strengths as an engine manufacturer)
3. Differentiate MHI’s turbochargers from peers by developing next-generation turbochargers (2-stage turbo charger, electronic control system, etc.)
Expansion of Engines Business

(1) Product lineup of Mitsubishi’s engines

- MEIKI engines
  - Small-sized engines: L, SL, SQ, SS, SK, SM, SB, SA, SB
  - Medium- and large-sized engines: SA, SH, SR, SU, KU, MAN, UE, SUZER

GMSVH is in charge of producing high-speed engines with power output of 3,700kw or less.

(2) Engines produced by GMSVH

Engines covering all types of use

- For agricultural machinery
  - MEIKI engines
- For vehicles including construction machinery
  - Small-sized engines
- For generator sets
- For marine use
  - Medium- and large-sized engines
  - EMS* (Energy Management Services)

Power Output

10 50 500 5000 50000 kW

*EMS: Energy Management Services
Market Environment

- Demand for replacement engines has increased as fuel emission regulations are being implemented
- Market size has expanded
  - Demand for small-sized engines mainly for construction machinery and agricultural machinery for BRICs countries has grown
  - Despite surging oil prices, demand for engines for power generation units has grown in areas where electric power supply is not stable
  - Demand for engines for ships has increased chiefly in Southeast Asia
- Corporate needs have changed: from ownership to usage

Efforts by MHI

- Develop engines in line with environmental regulation timetables in Japan, U.S. and Europe
- Beef up production capacity of facilities, including overseas facilities, in a timely manner to adapt to growing demand
- Strengthen service operations, including EMS and full-maintenance service contracts, to accommodate diversified needs of corporate customers
- Beef up production capacity including capacity at suppliers

![Diagram showing market environment and efforts by MHI]
Efforts to Develop Environmental Technologies

U.S. emission standards for off-road vehicles and equipment and MHI’s efforts

<table>
<thead>
<tr>
<th>Power Range</th>
<th>Tier I 1997~</th>
<th>Tier II 2003~</th>
<th>Tier III 2007~</th>
<th>Tier IV 2012~</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tier I</td>
<td>0.02</td>
<td>0.3</td>
<td>0.3</td>
<td>0.3</td>
</tr>
<tr>
<td>Tier II</td>
<td>0.02</td>
<td>0.3</td>
<td>0.3</td>
<td>0.3</td>
</tr>
<tr>
<td>Tier III</td>
<td>0.02</td>
<td>0.3</td>
<td>0.3</td>
<td>0.3</td>
</tr>
<tr>
<td>Tier IV</td>
<td>0.02</td>
<td>0.3</td>
<td>0.3</td>
<td>0.3</td>
</tr>
</tbody>
</table>

Development of engines in compliance with fuel emission regulations

Tier III-compliant engine with power output of 100kW
- Small-sized engine
- High turbo charging technology
- Production to start in Nov 2006

Tier-II compliant engine with power output of 2000kW
- Medium- and large-sized engine
- High pressure fuel injection
- New model production to start in April 2007

Efforts for other environmental consideration

Highest heat efficiency in this class of engine
- Clean emission mirror cycle gas engine

Ultra-low noise (70dB)
- Generator package

75~130 kW

Over 560 kW
Small Engines – Main Strategies

Expand business of vehicle engines to respond to the tightening of environmental regulations

**Number of Engines Manufactured**

<table>
<thead>
<tr>
<th>Year</th>
<th>CAT group</th>
<th>F/L, MAM and other</th>
<th>Export</th>
</tr>
</thead>
<tbody>
<tr>
<td>2003</td>
<td>28%</td>
<td>18%</td>
<td>54%</td>
</tr>
<tr>
<td>2008</td>
<td>39%</td>
<td>20%</td>
<td>41%</td>
</tr>
</tbody>
</table>

**Sales plans and strengthening of production capacity**

- **Response to the tightening of environmental regulations**
  - Complete development of Tier III-compliant engines (which can be marketed independently as an engine)
  - Joint development of Tier IV engines with growing construction machinery manufacturers (which can be marketed as a finished product covering after treatment, etc.)
  - Work on hybrid engine technology by leveraging strengths as a vehicle manufacturer

- **Strengthen production capacity**
  - Make an early start of operations of facilities invested (Establisht (annual) production of 150,000 engines at the Sagamihara plant at an early time)
  - Make progress in increasing production capacity at business partners (including ensuring sourcing of materials)

- **Expansion in growth markets**
  - Study possibility of entering in India, a growth market
  - Explore new OEM opportunities in forklift trucks and construction machinery manufacturers

- **Strengthen services**
  - Accommodate wide ranging customer needs by establishing remanufacturing as a business
  - Provide timely maintenance services based on operation records management
Medium and Large Sized Engines – Main Strategies

Focus on potentially profitable engines including engines for continuous power generation and ship engines.

Number of Engines Manufactured

- Market share (600 – 2500kW)
- MHI jumped from the world’s 5th largest to the 2nd largest group, solidifying its global position

2003

<table>
<thead>
<tr>
<th>Engine Manufacturer</th>
<th>Market Share</th>
</tr>
</thead>
<tbody>
<tr>
<td>CAT</td>
<td>19%</td>
</tr>
<tr>
<td>Montclus/ DDC</td>
<td>16%</td>
</tr>
<tr>
<td>MAN-B&amp;W</td>
<td>5%</td>
</tr>
<tr>
<td>Yanmar</td>
<td>5%</td>
</tr>
<tr>
<td>MHI</td>
<td>7%</td>
</tr>
<tr>
<td>Perkins</td>
<td>7%</td>
</tr>
<tr>
<td>Others</td>
<td>29%</td>
</tr>
</tbody>
</table>

2008

<table>
<thead>
<tr>
<th>Engine Manufacturer</th>
<th>Market Share</th>
</tr>
</thead>
<tbody>
<tr>
<td>CAT</td>
<td>21%</td>
</tr>
<tr>
<td>MHI</td>
<td>13%</td>
</tr>
<tr>
<td>Perkins</td>
<td>5%</td>
</tr>
<tr>
<td>Others</td>
<td>26%</td>
</tr>
<tr>
<td>Yanmar</td>
<td>5%</td>
</tr>
<tr>
<td>Montclus/ DDC</td>
<td>9%</td>
</tr>
<tr>
<td>Cummins</td>
<td>16%</td>
</tr>
</tbody>
</table>

Strengthening Sales Plan and Production Capacity

- Expand sales of engines for continuous power generation and ship engines
  - Engines for continuous power generation: Respond to the shift in demand to gas engines reflecting surging oil prices
  - Engines for marine use: Explore Southeast Asian and South American Markets
- Respond to the tightening of environmental regulations
  - Engines for continuous power generation: Respond to the shift in demand to gas engines reflecting surging oil prices
  - Ship engines: Explore Southeast Asian and South American Markets
- Beef up production capacity
  - Strengthen capabilities of offering power generation units in Southeast Asia
  - Promote overseas sourcing by strengthening purchasing functions at overseas facilities
- Strengthen service operations
  - Shift from generator sets to cogeneration
  - Strengthen competitive strength of products by attaching value (including drying processing system, etc.)

**Expansion of OEM business on a non-consolidated basis**

- Continue OEM supply to large power generation unit manufacturers
- Make inroads into U.S. and European markets with a lineup of gas engines which have achieved further efficiency

**Production capacity for 2004 (2,370 units/year)**

- 2003: 1,565
- 2004: 3,079
- 2005: 4,491
- 2006: 4,003
- 2007: 4,199
- 2008: 4,200

**Production capacity after investment**

- 2006: 4,200 units/year

**Adding MEA’s production capacity (400 units/year)**

- 2006: 400 units/year
Meiki Engines – Main Strategies

Increase profitability by shifting from a strategy to achieve higher margins without expanding scale to a strategy to achieve higher margins by expanding scale

**Strategy**
- To achieve higher margins without expanding scale

**Expansion Strategy**
- Expand scale by creating any kinds of sales opportunities through a change in mindset

**Production strategy**
- Produce and supply products and models accommodating markets and customers
- Produce and supply products and models accommodating markets and customers

**Sales strategy**
- Expand sales by fully utilizing all sales channels of MHI, GMSVH and affiliated companies
- Develop finished products (portable power generation unit, lawn mower)
- Enhance overseas sales network

**New business entry strategy**
- Make entry into new business areas
  - Gas cogeneration
Current State of Development of New Tanks

**Theme of development**

- Develop a tank which is smaller and lighter but maintains high levels of firepower and agility, in response to changes in needs from defense of domestic territories to defense of urban areas.
- Achieve improved combat capability in a tank battle by making exhaustive use of IT technology.

**Development Timetable**

<table>
<thead>
<tr>
<th>13</th>
<th>14</th>
<th>15</th>
<th>16</th>
<th>17</th>
<th>18</th>
<th>19</th>
<th>20</th>
<th>21</th>
<th>22</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prototype (Ammunition and turret)</td>
<td>Prototype (Body for engine bench test)</td>
<td>Prototype (Body)</td>
<td>Prototype (Tank for evaluation test)</td>
<td>Prototype (Four tanks)</td>
<td>Technical test</td>
<td>Practical trial</td>
<td>Completion and delivery</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Table of Specifications**

<table>
<thead>
<tr>
<th>Name</th>
<th>New model</th>
<th>Type-90 tank</th>
<th>Type-74 tank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gross weight (w/ fuel and ammunition)</td>
<td>Lighter than Type-90 tank</td>
<td>Approx. 50 tons</td>
<td>Approx. 38 tons</td>
</tr>
<tr>
<td>Number of crew</td>
<td>Same as Type-90</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Main gun</td>
<td>Higher power than Type-90</td>
<td>120 mm smoothbore gun</td>
<td>105 mm tank gun</td>
</tr>
<tr>
<td>Maximum speed</td>
<td>Same as Type-90</td>
<td>Approx 70 km/h</td>
<td>53 km/h</td>
</tr>
<tr>
<td>C41 function*</td>
<td>○</td>
<td>×</td>
<td>×</td>
</tr>
</tbody>
</table>

* Self-positioning and data-sharing-among-peer-tanks function (C4I: Command, Control, Communication, Computer, and Intelligence)
Medium- to Long-term Vision for GMSVH

Aim to expand scale while aiming to achieve higher quality and profitability

1. Transform business structure to achieve global standard and promote reform of a corporate culture which will support the transformation

2. Establish profit generating quality centering on production capabilities as the mother factory and product capabilities as the design center

3. Expand business globally by playing the role of control tower of overseas facilities