Briefing session on Air-conditioning & Refrigeration Systems, Paper & Printing Machinery and Machine Tool operations

Section 1: Air Conditioning & Refrigeration Systems Operations

September 27, 2007
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General Manager,
Air-conditioning & Refrigeration Systems Headquarters
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1. Outline of the Air Conditioning & Refrigeration Division
(1) Positioning of Air Conditioning and Refrigeration Operations

Select global B to C operations

Mitsubishi Heavy Industries’ sales figures for 2006

Mass and Medium-lot Manufactured Machinery

Ordered goods
1. Outline of the Air Conditioning & Refrigeration Division

(2) Scale of Air Conditioning and Refrigeration Operations

◊ Rapid improvements in our operating margin

- **Operating margin**
  - 2005: 0.1%
  - 2006: 1.6%
  - 2007 (forecast): 2.2%

(Unit: Billion yen)

- **Orders received**
  - 2005: 191.0
  - 2006: 197.4
  - 2007 (forecast): 198.5

- **Net sales**
  - 2005: 180.0
  - 2006: 180.0
  - 2007 (forecast): 180.0

**Margin:** 2%

**Scale of business:** ¥180 billion
1. Outline of the Air Conditioning & Refrigeration Division

(3) Divisional Policy

Creating environmentally friendly, highly reliable air conditioning and refrigeration products

Providing products and services that outperform other companies and increasing sales within domestic and overseas markets

Establishing an open organization and ensuring optimum consolidated management
1. Outline of the Air Conditioning & Refrigeration Division
(4) Product Overview

◇ A wide range of products, revolving around high-end items

- Residential use air-conditioner
- Commercial use air-conditioner/Centrifugal & Absorption Liquid Chiller
- Stores Offices Factories
- Automotive thermal systems
- Creating a pleasant environment in all aspects of daily life
- Cars
- Truck and trailer refrigeration units
- Transport of frozen goods (Coldchain)
1. Outline of the Air Conditioning & Refrigeration Division
(5) Breakdown of Air Conditioning and Refrigeration Sales

Sales figures for 2006

According to product
- Centrifugal & Absorption Liquid Chiller
- Commercial use air-conditioning machinery
- Transport refrigeration units
- Residential use air-conditioning machinery
- Automotive thermal systems
- Total: ¥198.5 billion

According to region
- Europe
- Japan
- US
- Asia
- Oceania
- China
- Total: ¥198.5 billion
- Percentage of overseas sales: 44%
1. Outline of the Air Conditioning & Refrigeration Division
(6) Global Operations

◇ Core operations in China and the rest of Asia and operations in North America, Europe and the Middle East
Outline of the Air Conditioning & Refrigeration Division

Outline of Growth Areas

Outline of Air Conditioning Operations
Our growth areas of business revolve primarily around high-end products. We have specifically positioned the following three lines of business as growth areas in which we intend to significantly expand the scale of our operations in the future.

- Automotive thermal systems
- Transport refrigeration units
- Centrifugal & Absorption Liquid Chiller
Automotive thermal systems
2. Growth Areas (1) Automotive thermal systems (i) Product Lineup

- Engine cleaning
- Controllers
- 3D compressors
- Electric compressors
- Compressors
- HVAC
2. Growth Areas  (1) Automotive thermal systems (ii) Our Customers

Europe
- Ned Car (Netherlands)
- MFTE (Portugal)
- Magyar Suzuki (Hungary)

Japan/Asia
- Mitsubishi Motors
- Suzuki
- Mitsubishi Fuso
- Beijing Benz (China)

North America
- General Motors
- Ford
- Mitsubishi Motors

Southeast Motor (China)
China Motor (Taiwan)
Changan Suzuki (China)
TATA (India)
2. Growth Areas  (1) Automotive thermal systems (iii) New Products - New Scroll Compressors

- Smaller, lighter and more efficient thanks to its three dimensional compression mechanism
  Reduced number of components  (- 15%)
  Smaller and lighter  (- 29%)
  More efficient  (- 32%)
  (Figures in brackets: compared to current levels)
- Series development
  Current compressors:  60cc, 90cc, 105cc
  New compressors:  50cc, 70cc, 90cc
- Compatible with environmentally friendly hybrid, electric and fuel cell vehicles
- Scheduled to commence mass production in September 2007
2. Growth Areas  (1) Automotive thermal systems (iv) Overseas Bases

- **Company name**: MHIE
- **Established**: 2000
- **Headquarters**: Netherlands
- **Business activities**: Sales of car air conditioners

- **Company name**: MCC
- **Established**: 1995
- **Headquarters**: Indiana (USA)
- **Business activities**: Development base for car air conditioners

- **Company name**: MACC
- **Established**: 2003
- **Headquarters**: Shanghai (China)
- **Business activities**: Production and sales of car air conditioners

- **Company name**: MCC
- **Established**: 1995
- **Headquarters**: Indiana (USA)
- **Business activities**: Production and sales of car air conditioners
Transport refrigeration units
2. Growth Areas  (2) Transport refrigeration units  (i) Product Lineup

**Trailer units**
- (10t trailers or larger)

**Direct-mounted units**
- (0.75-11t trucks)

**Under-mounted units**
- (4-11t trucks)

**Nose-mounted units**
- (0.75-11t trucks)

- Combined (evaporator and condenser) units
- Combined isolation units
- New 3D compressor
- Controller

- Evaporator units
- Condensing units
- Controller
- Controller
2. Growth Areas (2) Transport refrigeration units (ii) New Products

◇ New direct-mounted series equipped 3D scroll compressors

Combined (evaporator and condenser) units

Combined isolation units

25% ※ improvement in fuel consumption

30% ※ improvement in power consumption

25% ※ improvement in CO₂ emissions

Reduced maintenance costs

Equipped with 3D scroll S Series

Energy saving

Environment

High quality

* Compared to current Mitsubishi Heavy Industries models
2. Growth Areas (2) Transport refrigeration units (ii) New Products

◇ Launching new trailer units

TFV2000 (PEGASUS)
Ultra-slim sub-engine trailer unit

Enabling world leading refrigeration capacity
(19,000W; inside temperature: 0ºC)
2. Growth Areas (2) Transport refrigeration units (ii) Market Overview

◇ Shifting focus from Japan and Asia towards full-scale entry into European market

**Envisioned sales expansion in future**

- **Europe**
  - Trailers: 26%
  - Small-medium: 51%
  - Large: 23%
  - 52,000 units

**Current markets**

- **Asia**
  - Trailers: 26%
  - Large: 35%
  - Small-medium: 63%
  - 10,000 units

- **Japan**
  - Trailers: 29%
  - Large: 70%
  - Small-medium: 1%
  - 28,000 units

- **North America**
  - Trailers: 20%
  - Small-medium: 28%
  - Large: 52%
  - 55,000 units

- Full-scale entry into European market on the back of trailer unit development
- Maintaining top share of Japanese market
- Increasing sales in Asia, especially for the Chinese market
- Plans to look into operations in North America after increasing sales in Europe
2. Growth Areas (2) Transport refrigeration units (iii) Increasing Sales in Europe

◊ Establishing distributors in five main countries and achieving 80% coverage of the European market

* Already established in UK, Germany, Spain and Italy

- UK
- Germany
- France
- Spain
- Italy
2. Growth Areas (2) Transport refrigeration units  (iv) Increasing Sales in China

◇ Establishing position as number three manufacturer in the Chinese market, after US manufacturers
2. Growth Areas  (2) Transport refrigeration units  (v) Increasing Domestic Sales

◇ Establishing a powerful sales and service network and racing ahead with the number one share of the market

A global scale business linked together by freshness

Ryujyu Coldchain Co. Ltd

Details of head office and sales offices
Centrifugal Liquid Chiller operations
2. Growth Areas (3) Centrifugal Liquid Chiller (i) Product Lineup

**AART Series**
Capacity range: 215-4000USRt

<table>
<thead>
<tr>
<th>Rated COP</th>
<th>Capacity Range</th>
<th>Cold Water Temperature</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.4</td>
<td>AART-145, 180, 200</td>
<td>12 °C/7 °C</td>
</tr>
<tr>
<td><strong>IPLV</strong></td>
<td><strong>7.9</strong></td>
<td>AART-100</td>
</tr>
</tbody>
</table>

**Microturbo W Series**
Capacity range: 50-100USRt

<table>
<thead>
<tr>
<th>Rated COP</th>
<th>Partial load COP</th>
<th>Cold Water Temperature</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.7</td>
<td>14.1</td>
<td>12 °C/7 °C</td>
</tr>
</tbody>
</table>

**Inverter-driven AART-I Series**
Capacity range: 215-4000USRt

<table>
<thead>
<tr>
<th>Partial load COP</th>
<th>Coolant Intake Temperature</th>
</tr>
</thead>
<tbody>
<tr>
<td>21.9</td>
<td>12 °C</td>
</tr>
</tbody>
</table>
2. Growth Areas (3) Centrifugal Liquid Chiller (ii) Turbo Heat Pumps

* Joint development in conjunction with Tokyo Electric Power (TEPCO), Chubu Electric Power and Kansai Electric Power

High performance: COP 5.0

Compact

Uses mixed refrigerants 410A

Developing large capacity air-cooled heat pumps

Compatible with up to 600USRt

(Possible to connect up to four units through modularization of single 150USRt units)

Minimal space required for installation

30% less space than regular units

(Per unit capacity)

Absorption cooling and heating (150-600USRt)

Ideally suited for easy replacement

* Joint development in conjunction with Tokyo Electric Power (TEPCO), Chubu Electric Power and Kansai Electric Power
2. Growth Areas  (3) Centrifugal Liquid Chiller (iii) Uses for Turbo Chillers

- IT industry
- Shopping centers
- Auto industry
- Hotels & hospitals
- Clean rooms
- Sports facilities
- Office buildings
- Chemical & food industries
- Auto industry
- Office buildings
- Chemical & food industries
2. Growth Areas (3) Centrifugal Liquid Chiller (iv) Absorption Chiller Performance Comparison

* COP: Coefficient of performance

\[
\text{COP} = \frac{\text{Refrigeration capacity (kW)}}{\text{Chiller power consumption (kW)}} = 6.4
\]
(at 100% load operation)

Fuel required by turbo chillers: 53

Fuel required by absorption chillers: 100

Absorption \rightarrow Turbo chillers halve fossil fuel consumption!
Domestic turbo market experiencing underlying expansion

Growth at an annual rate of roughly 9% based on capacity
2. Growth Areas (3) Centrifugal Liquid Chiller (vi) Overseas Operations

◇ Currently working on increasing sales of high efficiency turbo chillers, especially in Asia

- China: Guangzhou Exhibition Center
- Hong Kong: Mega Tower
- Dubai: Al Murooj Complex
- Singapore: Cooling and heating in Marina South area
Currently expanding our sales and service network as the leading manufacturer on the domestic market

General domestic sales company:
**Mitsubishi Heavy Industries Air Conditioning and Refrigeration Systems Corporation**

- Tohoku sales office
- Tokyo headquarters Service Department (East)
- Western branch
- Toyama office
- Chugoku sales office
- Kyushu branch
- Service Department (West)
- Tohoku sales office
- Nagasaki office
- Tokyo service center
- Oita office
- Kagoshima office
- Mie office
- Central branch
- Tohoku sales office
- Tokyo headquarters Service Department (East)
Outline of the Air Conditioning & Refrigeration Division

Outline of Growth Areas

Outline of Air Conditioning Operations
3. Air conditioning Operations  (i) Product Lineup

Home air-conditioner

Luxury SI Series

Standard ZI Series

Industrial air-conditioner
3. Air Conditioning Operations (ii) New Products

◇ Development of lightweight outdoor units and increased usage of compact technology

Enabling space saving and facilitating installation

New Hyper INV (4 horsepower)  New Hyper INV (5, 6 horsepower)  New Hyper INV (8, 10 horsepower)  (4, 5 horsepower)  (8, 10, 12 horsepower)
3. Air Conditioning Operations (ii) New Products

Significant reductions in size and weight to facilitate installation

Making installation easier when renewing equipment

⇒ Examples of size and weight reductions (4 horsepower)

<table>
<thead>
<tr>
<th></th>
<th>Previous model</th>
<th>New model</th>
</tr>
</thead>
<tbody>
<tr>
<td>Height</td>
<td>1,300 mm</td>
<td>845 mm</td>
</tr>
<tr>
<td>Weight</td>
<td>95 Kg</td>
<td>74 Kg</td>
</tr>
</tbody>
</table>

 Reduction of 35%

 Reduction of 28%

Hight -455mm

New model (4 horsepower)
3. Air Conditioning Operations (2) Market Scale

◊ Leveling off of domestic market but rapid growth in Chinese and European markets

<table>
<thead>
<tr>
<th>Country/Region</th>
<th>Market scale</th>
<th>Demand</th>
</tr>
</thead>
<tbody>
<tr>
<td>Japan</td>
<td>Level (reduced new purchases but increase in replacement purchases)</td>
<td></td>
</tr>
<tr>
<td>China</td>
<td>Rapid growth</td>
<td></td>
</tr>
<tr>
<td>Rest of Asia</td>
<td>Rapid growth</td>
<td></td>
</tr>
<tr>
<td>Europe</td>
<td>Growth</td>
<td></td>
</tr>
<tr>
<td>USA</td>
<td>Level</td>
<td></td>
</tr>
</tbody>
</table>

(Unit: million yen)

Demand according to region

Japan
- '95: 8.6
- '00: 7.8
- '05: 8.3

China
- '95: 4.4
- '00: 9.1
- '05: 9.8

Rest of Asia
- '95: 0.3
- '00: 0.5
- '05: 0.8

Europe
- '95: 1.0
- '00: 2.1
- '05: 2.4

North America
- '95: 9.2
- '00: 12.3
- '05: 14.1

Latin America
- '95: 4.4
- '00: 4.8
- '05: 7.3

Compiled based on data published by the Japan Refrigeration and Air Conditioning Industry Association.
3. Air Conditioning Operations (3) Developments in Air Conditioning Operations

◇ Restructuring through selection and concentration ➔ Expansion centered around overseas operations

**STEP 1** Restructuring business
- Transferring control of RAC overseas
- Substantially scaling back mass domestic RAC sales

2002 - 2004

**STEP 2** Reinforcing foundations
- Shifting control of PAC production overseas
- Scaling back unprofitable operations
- Full-scale overseas business development

2005 - 2007

**STEP 3** Expanding business
- Expanding overseas business
- Product development geared towards differentiation
- Entry into upstream and downstream areas

2008 - 2011
3. Air Conditioning Operations (4) Overseas Operations (i) European Market

◇ Establishing position as the top Japanese group, leading with multi-function building systems

Free training using our AC systems

Currently reinforcing our construction and service framework in order to expand sales of multi-function building systems

Currently increasing distributor numbers with an eye to expanding sales of PAC/RAC in the European market

Full-scale entry into European heat pump market

Under-floor heating

Hot water supply

◇ Number two Japanese group in the Chinese multi-function building system market

**Major buildings with multi-function systems in China (construction completed)**

- **Donghuan Plaza** (Commercial complex)
  - Construction completed summer 2005
  - KX2 & KX4 mini x 3,300 horsepower

- **Li Yuan Mountain Retreat** (State guest house)
  - Construction completed summer 2004
  - KX2 & PAC x 2,800 horsepower

- **Shaoniangong 2** (State educational facility)
  - Construction completed Spring 2005
  - KX2 & PAC x 2,000 horsepower

- **North Bank Wealth and Business Center** (Commercial complex)
  - Construction completed Autumn 2007
  - KX4 x 5,200 horsepower

- **Soochow University New Campus** (General university)
  - Construction completed summer 2006
  - KX4 x 2,000 horsepower

- **International Chamber of Commerce Tower** (Office building)
  - Construction completed winter 2004
  - KX2 x 5, 200 horsepower

- **Hangzhou Street** (Commercial facility)
  - Construction completed Summer 2006
  - KX4 x 700 horsepower

- **Richgate** (Deluxe apartments)
  - Construction completed Summer 2006
  - KX4 x 700 horsepower

- **Heung-to Oasis** (Luxury apartments)
  - Construction completed Spring 2006
  - KX4 mini x 2,250 horsepower

- **Hangzhou Street** (Commercial facility)
  - Construction completed Winter 2004
  - KX2 x 3,000 horsepower

- **Heung-to Oasis** (Luxury apartments)
  - Construction completed Spring 2006
  - KX4 mini x 2,250 horsepower

- **Hangzhou Street** (Commercial facility)
  - Construction completed Winter 2004
  - KX2 x 3,000 horsepower
3. Air Conditioning Operations (5) Overseas Bases

- **Company name**: MJA
  - **Established**: 1994
  - **Headquarters**: Jiangmen, Guangdong (China)
  - **Business activities**: Production and sales of interior air conditioners

- **Company name**: MHAQ
  - **Established**: 1993
  - **Headquarters**: Qingdao (China)
  - **Business activities**: Production and sales of air conditioner packages

- **Company name**: SELECT
  - **Established**: 1986
  - **Headquarters**: Jeddah (Saudi Arabia)
  - **Business activities**: Production and sales of interior air conditioners

- **Company name**: MACO
  - **Established**: 1988
  - **Headquarters**: Bangkok (Thailand)
  - **Business activities**: Production and sales of interior air conditioners

- **Company name**: THACOM
  - **Established**: 1988
  - **Headquarters**: Chachoengsao (Thailand)
  - **Business activities**: Production and sales of compressors for air conditioners
3. Air Conditioning Operations (6) Domestic Sales and Service Network

◇ Providing general air conditioner sales and services nationwide

General domestic sales company:
MHI Air-Conditioning and Thermal Systems Corporation