

Japanese Aerospace Industry **Emerging Worldwide Partner**

Shigeyoshi HATA

The Society of Japanese Aerospace Companies



in Farnborough Air Show

July 16 , 2014

What is SJAC ?



- **Sole public entity founded in 1952 as a private forum representing the interests of Japanese aerospace industry**

- **Mission**
 1. **Industrial Policies Promotion**
 - Participation and support in reviewing aerospace administration
 - Negotiation with government ministries and departments
 2. **Industrial Foundation Buildup and Maintenance**
 - Wide range of survey, research and investigation on industries status quo
 - Search of trends in aerospace technology
 - Review of technical standards, i.e. ISO
 3. **Cooperation with Oversea Aerospace Industries**
 - Participation in international exhibitions and hold meetings
 4. **Host our international exhibition every 4 years**

- **Member**
 - Regular : 90 Companies
 - Associated : 46 Companies

Current Topics

Aircraft :

- The Japanese government adopted new “**Three Principles on Transfer of Defense Equipment and Technology**” on April 1, 2014.
- This new policy will make us contribute to **international cooperation in joint development / production of defense products**.
- Previously, Japan`s aircraft production relied heavily on demand from defense sector, however, this trend is changing due to **considerable sales expansion in civil aircraft production**.
- The full-scale manufacturing of MRJ has been proceeding toward its **first flight scheduled in 2014**.

Space :

- The government revised the **Basic Space Plan** and integrated the promotion of Japan`s space industry into overall space policy in 2013.
- The revision implies our industry **expand appearance in the overseas market** under the joint effort between government and private sector.

Examples of Domestic Products : Aircraft



Aircraft Developed by Japanese Aerospace Industry



US-2



MRJ



P-1



C-2



BK117 C-2

Examples of Domestic Products : Space Vehicles



(Source : JAXA)



International Space Station
Experiment Module

(Source : JAXA)



H-2A / H- 2B

(Source : JAXA)

(Source : JAXA)



Planetary Exploration

(Source : JAXA)



H-2B Transfer Vehicle

(Source : JAXA)



Epsilon



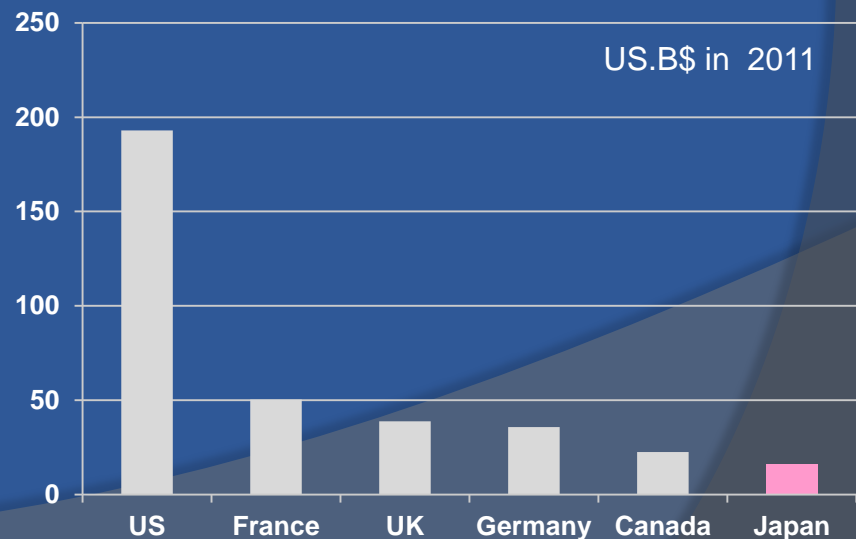
Quasi- Zenith Satellite

Current Views of Japanese Aerospace Industry



- Employees (2012) : **35,411** persons
Aircraft 27,230 persons
Space 8,181 persons
- Total Product Sales (2012) : **US\$ 14.83 Billion**
Aircraft US\$ 11.67 Billion
Space US\$ 3.16 Billion (1 US\$ = ¥ 100)

When compared with the automobile, home electric, computer and other industries in Japan, the aerospace industry is still relatively small.



Current Views of Japanese Aerospace Industry



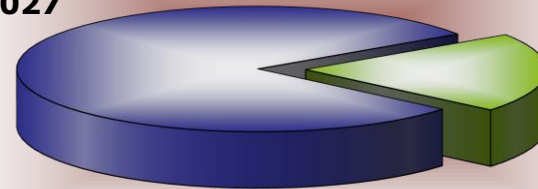
Turnover of Aerospace in 2011

Turnover in 2011

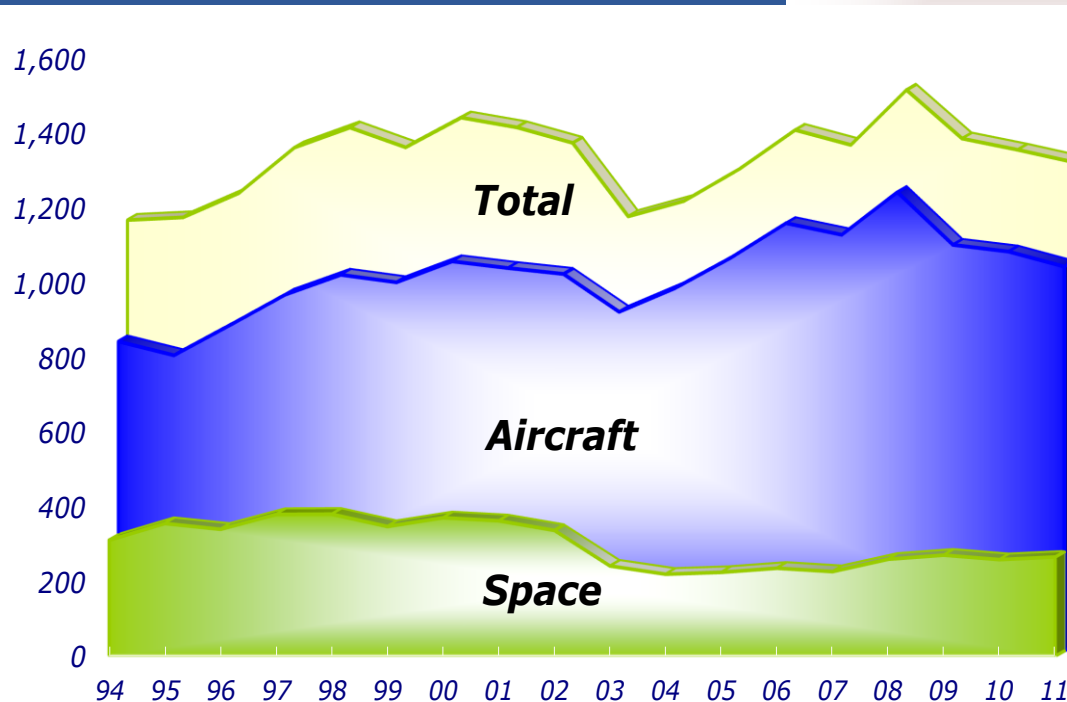
Total 1,292

Aircraft
1,027

Space
265



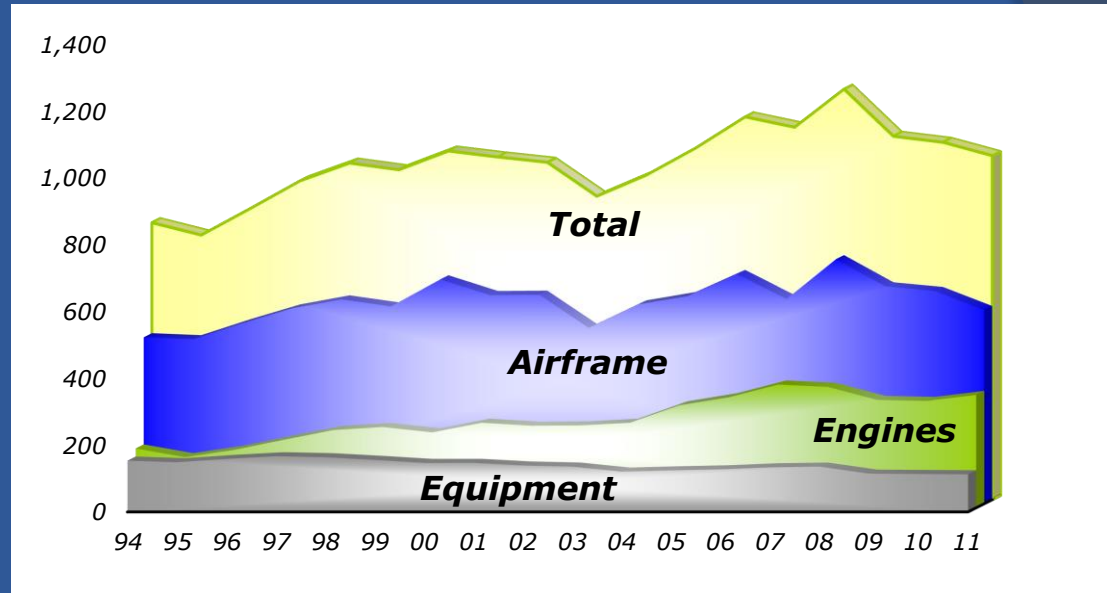
(unit : Billion Yen)



Current Views of Japanese Aerospace Industry

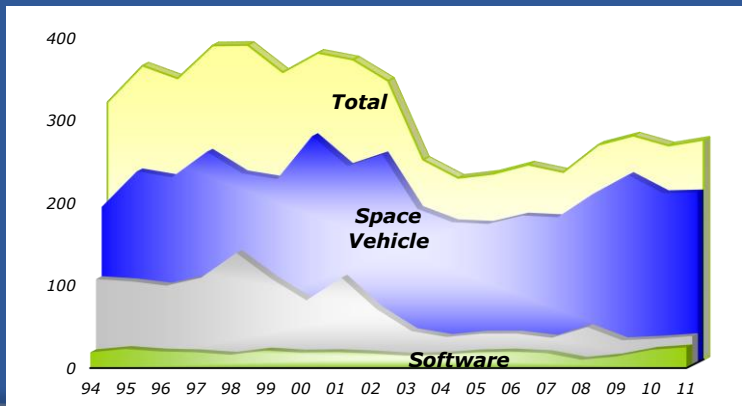


Turnover of Aircraft Products



(unit : Billion Yen)

Turnover of Space Products



Current Views on Activities : International Programs



The total work share of Japanese firms will account for approximately **35% of the 787** structures and systems.

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Boeing787 *Japan Supplier Work Statement*

MITSUBISHI
HEAVY INDUSTRIES, LTD.

Mitsubishi Heavy Industries
Wing box

Kawasaki

Kawasaki Heavy Industries

- Forward fuselage
- Main landing gear wheel well
- Fixed trailing edge

IHI
Realize your dreams

IHI Corporation
LPT Rotor, C-sump, Mid Fan Shaft,
HPC Rotor Blade & Stator Vane,
LPT Module Assembly

GEEnx(GE)

Kawasaki

Kawasaki Heavy Industries
IPC MODULE

SUBARU

Fuji Heavy Industries

- Center wing box
- Integration of center wing box with main landing gear wheel well

MITSUBISHI
HEAVY INDUSTRIES, LTD.

Mitsubishi Heavy Industries
Combustor Module

Trent1000 (Rolls Royce)

Nabtesco

Nabtesco Corporation

- High Voltage DC Rack & Panel

Other Japan Supplier Work Statement

<p>BRIDGESTONE – Tire</p> <p>GS YUASA TECHNOLOGY – Lithium-ion battery system</p> <p>JAMCO – lavatories, flight deck interiors, flight deck door & bulkhead assembly</p>	<p>PANASONIC AVIONICS – cabin series system</p> <p>TAMAGAWA SEIKI – sensor, DC motor</p> <p>TORAY INDUSTRIES – TORAYCA® prepreg composites</p>
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DAIDO STEEL

Daido Steel

- Engine shaft (GEEnx/Trent1000)

ShinMaywa
Brighten Your Future

SHINMAYWA INDUSTRIES

- Engine shaft (GEEnx/Trent1000)

MMC SUPERALLOY

MMC Superalloy Corporation

- Nickel based alloy Case

SPP ◆ SUMITOMO PRECISION PRODUCTS CO., LTD.


Sumitomo Precision Products

- APU Oil Cooler

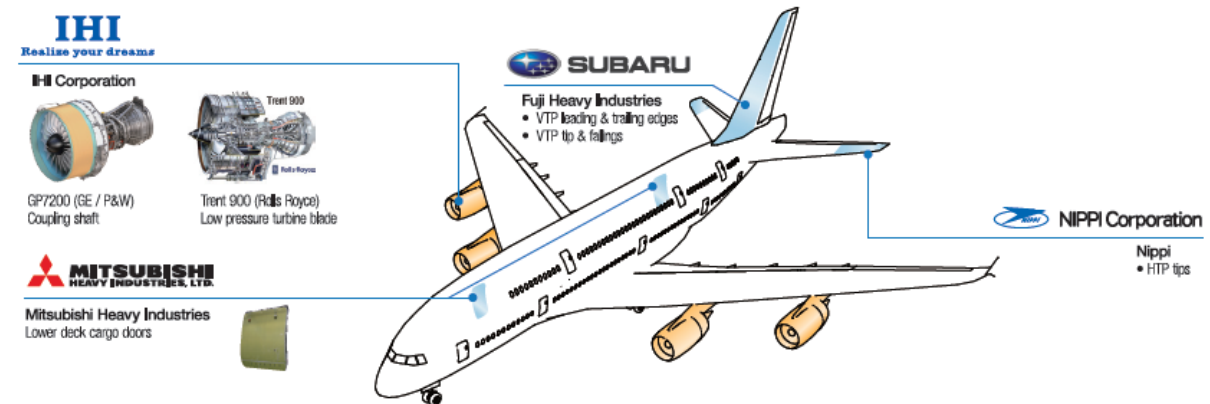
Current Views on Activities : International Programs



18 Japanese companies are participating in the A380 program as the parts suppliers.

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A380 Japan Supplier Work Statement



IHI
Realize your dreams
IHI Corporation

- GP7200 (GE / P&W) Coupling shaft
- Trent 900 (Rolls Royce) Low pressure turbine blade

MITSUBISHI HEAVY INDUSTRIES, LTD.
Mitsubishi Heavy Industries
Lower deck cargo doors

SUBARU
Fuji Heavy Industries

- VTP leading & trailing edges
- VTP tip & fairings

NIPPI CORPORATION
Nippi
• HTP tips

Other Japan Supplier Work Statement

- BRIDGESTONE** – Tires for nose & main, Landing gear system
- JAMCO** – Galley system, VTP stringers & stiffeners, CFRP upper floor beams, Rear e-bay rack assembly
- KOMY** – Overhead bin's mirrors
- MAKINO MILLING MACHINES** – High Performance Machining Centers
- MINEBEA** – Highly engineered rod ends & bearing
- NIKKISO** – CFRP cascades for thrust reversers
- PANASONIC AVIONICS** – In-flight entertainment system
- SHINMAYWA INDUSTRIES** – Wing root fillet fairings, Wing ramp surface panels
- SHOWA AIRCRAFT INDUSTRIES** – Nomex honeycomb
- NIPPON STEEL & SUMITOMO METAL** – Titanium sheets
- SUMITOMO PRECISION PRODUCTS** – Gear uplock spring strut assembly for the wing landing gear actuation system
- TORAY INDUSTRIES, TOHO TENAX** – 100% of intermediate modules carbon fibers
- THE YOKOHAMA RUBBER** – Pre-pregs, CFRP Water & Waste Tanks

MMC SUPERALLOY
MMC Superalloy Corporation
• Nickel based alloy Case

Current Views on Activities : International Programs



2 Major Companies are participating in Engine for 787.

TRENT 1000 (Rolls-Royce)

Participation of Japanese Companies :

KHI : Intermediate Pressure Compressor Module

MHI : Combustor Module, Low Pressure Turbine Blade



Image source : Rolls-Royce

GENx (General Electric)

Participation of Japanese Companies :

IHI : Low Pressure Turbine Module,
High Pressure Compressor Parts,
Low Pressure Turbine Shaft

MHI : Combustor Case

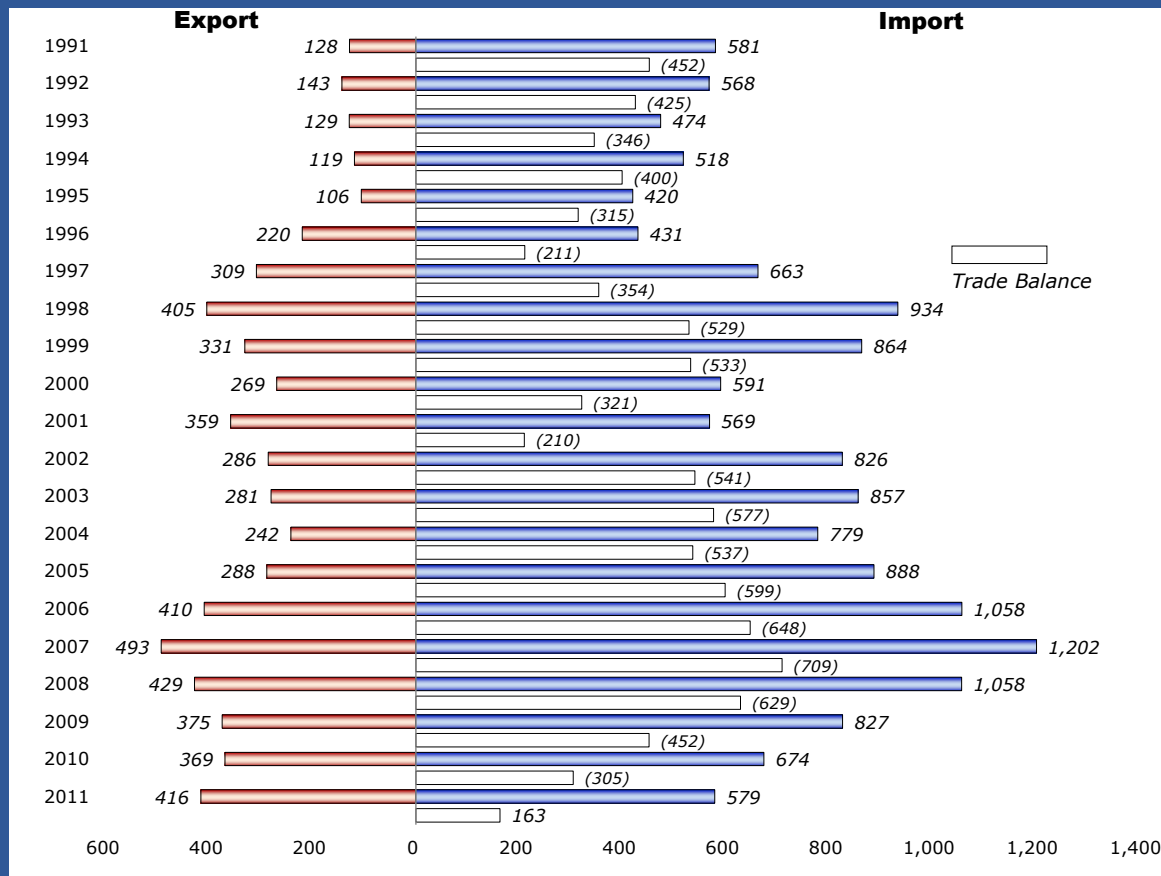


Image source : General Electric

Current Views of Japanese Aerospace Industry



Historical Views of Trade Balance in Aircraft Industry

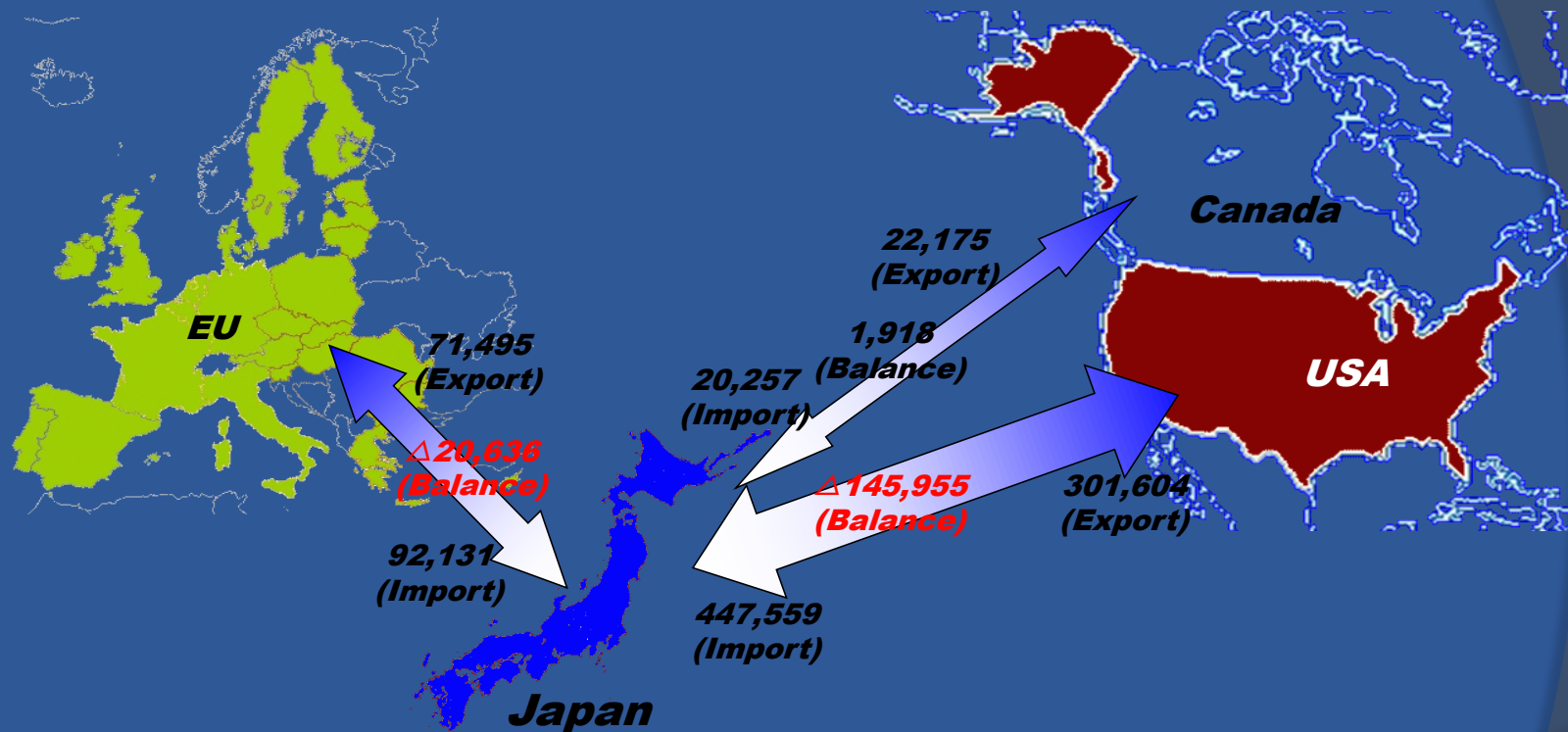


The trade balance was in pronounced deficit, however, the deficit is gradually narrowing with growing demand for aircraft exports in the private sector.

Current Views on Activities : Trade Balance



Japan ⇔ USA / EU



JAPAN ⇔ All Countries
Export ¥ 416,098 billion
Import ¥ 579,106 billion

Aerospace foreign trade in 2011 amounted to negative ¥163 billion

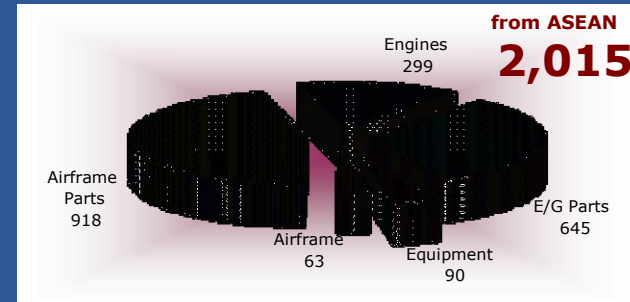
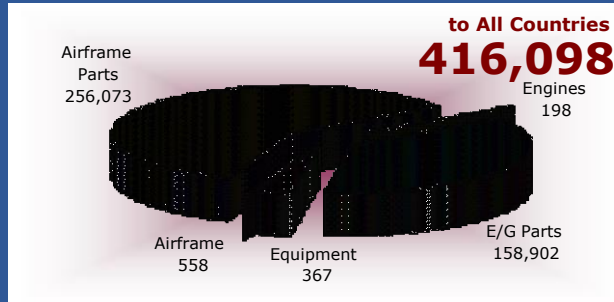
Current Views on Activities : Trade Balance



Export

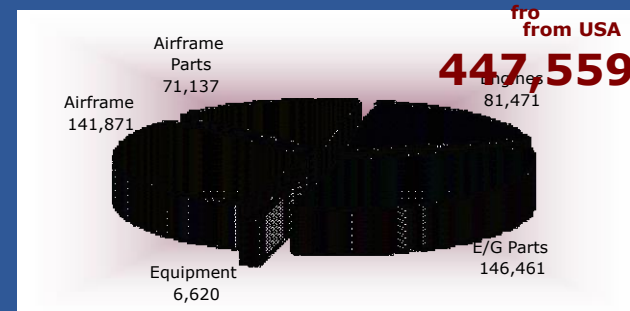
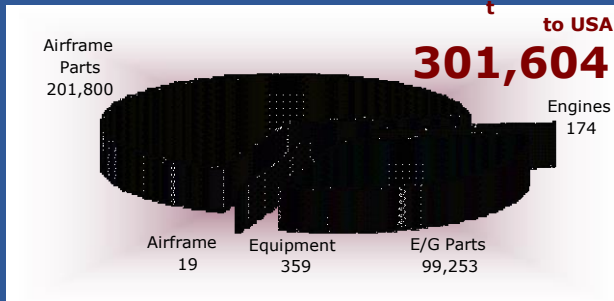
Import

All countries



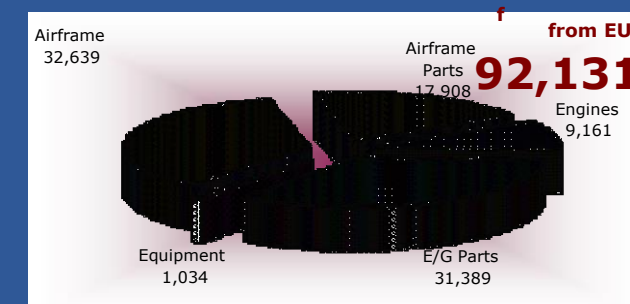
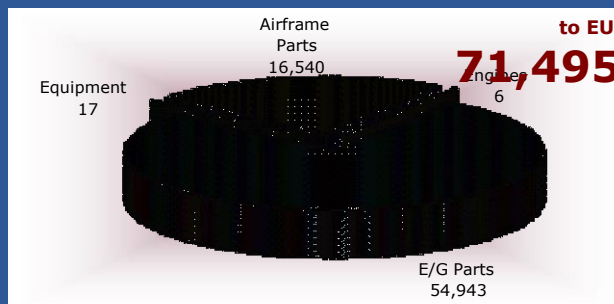
Asia

USA



USA

EU



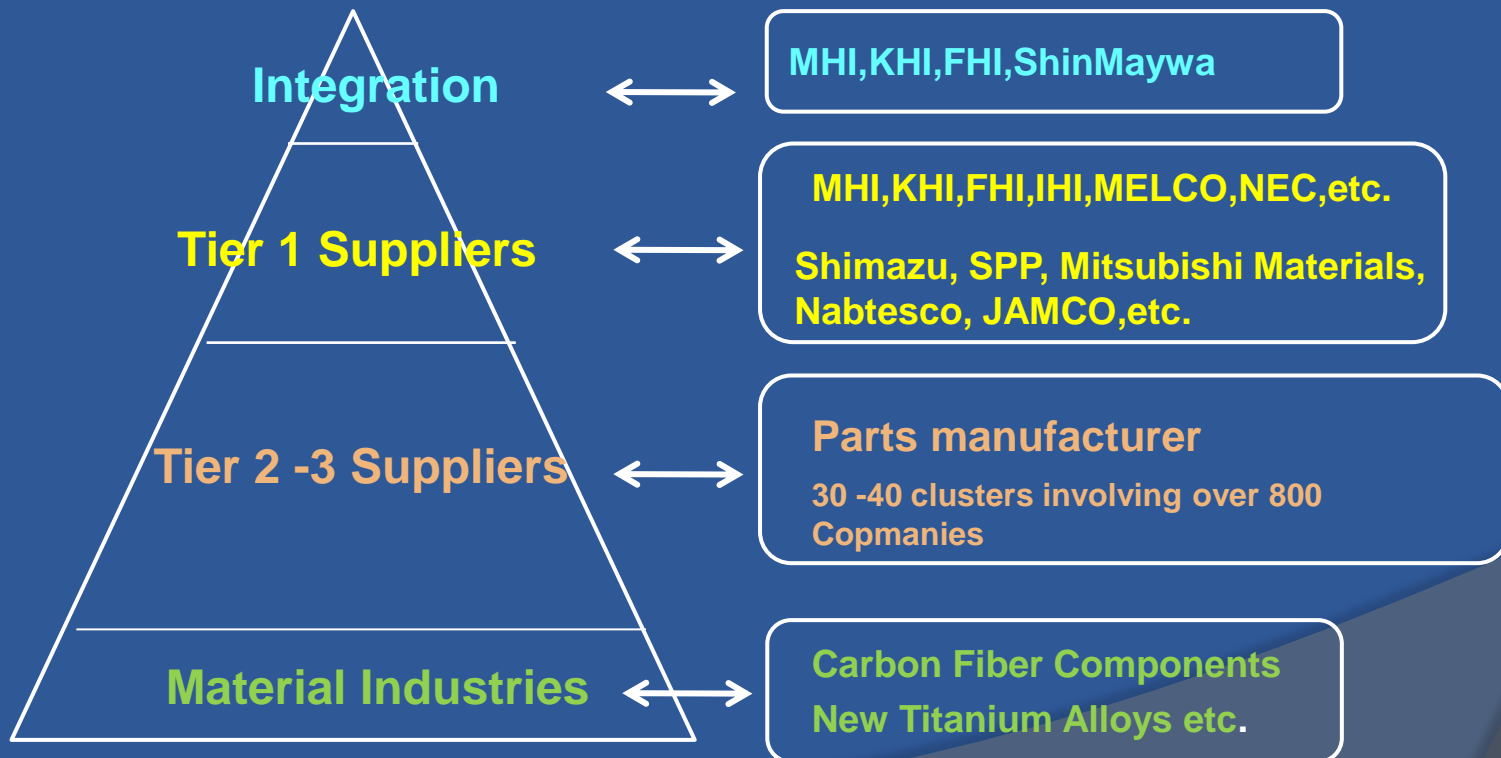
EU

Unit : Millions of Yen

Current Views of Japanese Aerospace Industry



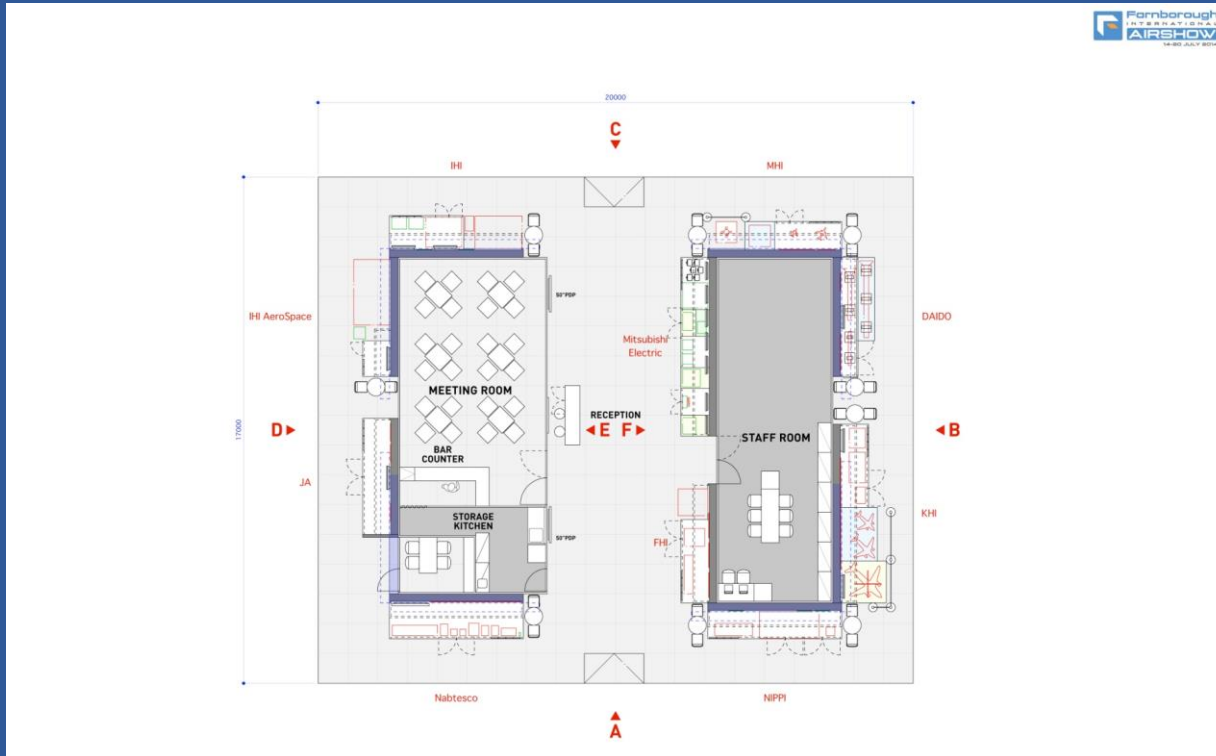
Japan is one of the few countries that can provide service in almost the entire aircraft field ranging from system integration to material components.



Our Location in the Air Show



Booth #. C-17, Hall 2



Chalet 270,272,274,276 Row A : Mitsubishi Aircraft Corporation

 IHI AeroSpace

IHI

 **Kawasaki**

 **DAIDO STEEL**



 NIPPI Corporation

Nabtesco

 **MITSUBISHI**
AIRCRAFT CORPORATION

 **MITSUBISHI**
ELECTRIC
Changes for the Better

 **MITSUBISHI**
HEAVY INDUSTRIES, LTD.
Our Technologies, Your Tomorrow



FUJI HEAVY INDUSTRIES LTD.



Thank you for your Attention

The Next Japan Aerospace International Exhibition is held in Tokyo in October, 2016.

*More details on SJAC :
Please access*

http://www.sjac.or.jp/en_index.html