



# AEROSPACE

## BASIC INDUSTRY INFORMATION

The Philippines is a developing player across the aerospace industry value chain, with capabilities in aerospace parts manufacturing, aircraft maintenance and repair (MRO) and aviation/aerospace/engineering trainings.

- The Philippines is a newcomer to the aerospace parts manufacturing industry, but export figures in the past five years show expansion and upgrading in product coverage and markets, as companies from the Tier 1-3 supplier segments invest in new facilities and obtain standards/certifications to cater to the manufacturing requirements of the global industry. The Philippines is host to three aerospace Original Equipment Manufacturers (OEMs) producing for the requirements of commercial aircraft industry, across a wide range of products: flight control actuation systems, interiors, fit-out, galleys and equipment. In support of this, a local supply chain capability for aerospace is developing, with local Tier 2-3 manufacturers supplying for OEM requirements, with capabilities on precision machining, design, and developing capabilities on surface processing and testing. The Philippines was able to export around US\$ 580.9 million of aerospace parts in 2016
- The Philippines is host to two major MRO brands catering to the requirements of the commercial aviation industry, both domestic and international. Recent expansion of the industry includes investments in hangars that can accommodate MRO services to widebody aircrafts.
- In support of the MRO, parts manufacturing, and aviation industries, the Philippines has various schools that supply the human resource and training requirements of these key segments.

## Product/Service Coverage

### Parts Manufacturing

- Flight control actuation systems; servoactuators; servovalves
- Galley inserts, structures and equipment; seat parts; lavatories
- Interior fit-out
- Panel assembly
- Airframes and sub-assemblies
- Assembly of Light-Sports Aircraft (LSA)

### MRO

- Base Maintenance for commercial aviation
- Line Maintenance for commercial aviation
- Engineering Training
- MRO for general aviation

### Aviation Trainings

- Aircraft Maintenance Technology
- Aircraft Maintenance Training (Technician)
- Aeronautical Engineering
- Aviation Management
- Commercial Flying
- Composites Repair Training

## Major Players

Subsector	Major Players
Flight control actuation systems; servoactuators; servovalves	Moog Controls Corp. (Tier 1 OEM) Tier 2 Suppliers: - Famous Secret Precision Machining Inc. - Applied Machining Corp.
Galley inserts, structures and equipment; seat parts; lavatories Interior fit-out Panel assembly	B/E Aerospace JAMCO Philippines
Assembly of Light-Sports Aircraft, others	Famous Secret Precision Machining Inc. Philippine Aerospace Development Corporation (PADC)
Base Maintenance and Line Maintenance for Commercial Aviation	SIA Engineering Philippines (SIAEP) Lufthansa Technik Philippines (LTP)
MRO for General/Government/ Defense Aviation	PADC Asian Aerospace Metrojet Engineering
Aircraft Maintenance Technology Aeronautical Engineering Composites Repair Training	PATTS College of Aeronautics SIAEP
Aviation Management Commercial Flying	WCC Aviation Company Philippine Academy for Aviation Training (PAAT)

## Industry Association/s

- Aerospace Industries Association of the Philippines (AIAP)
- Aviation Schools Association of the Philippines (ASAP)

## Linkages

- Metalworking Equipment
- Aerospace-Grade Metals (Steel, Aluminum, Titanium)
- Chemical, Plastics, Rubber
- Auto Parts
- Electronics
- Tourism
- Aviation (Commercial and General)
- Air Cargo Logistics
- Shipping

## Performance (Aerospace Parts Manufacturing Industry)

Indicators		2015	2016
Trade	Exports (Aerospace Parts)	US\$ 542.2 Million	US\$ 735.8 Million
	Imports (Aircraft and Parts)	US\$ 1.258 Billion	US\$ 1.817 Billion
Employment		6,000	Same

Sources: UN Comtrade Statistics (2016), based on NSO (Jan. 2016) Duke University, The Philippines in the Aerospace Global Value Chain (May 2016) for employment data

## Top Exports

- Flight control actuation systems; servoactuators; servovalves
- Galley inserts, structures and equipment; seat parts; lavatories
- Interior fit-out
- Panel assembly
- Assembled Light-Sports Aircraft (LSA)

## Export Destinations (2016)

- |                               |                            |
|-------------------------------|----------------------------|
| 1. United States (US\$ 298 M) | 6. Netherlands (US\$ 23 M) |
| 2. France (US\$ 185 M)        | 7. Germany (US\$ 20 M)     |
| 3. United Kingdom (US\$ 58 M) | 8. Malaysia (US\$ 17 M)    |
| 4. Japan (US\$ 35 M)          | 9. Singapore (US\$ 15 M)   |
| 5. Spain (US\$ 24 M)          | 10. Ireland (US\$ 14 M)    |

## Top Imports

- Aircrafts/Airplanes/Helicopters
- Aircraft Engines
- Aircraft Tires
- Aircraft Launching Gear

## Import Sources (Jan.-Oct. 2016)

- |                               |                               |
|-------------------------------|-------------------------------|
| 1. United States (US\$ 521 M) | 6. Cayman Islands (US\$ 65 M) |
| 2. France (US\$ 432 M)        | 7. United Kingdom (US\$ 53 M) |
| 3. Germany (US\$ 280 M)       | 8. Spain (US\$ 34 M)          |
| 4. Singapore (US\$ 119 M)     | 9. Malaysia (US\$ 33 M)       |
| 5. Korea (US\$ 82 M)          | 10. Japan (US\$ 32 M)         |

## Top Investors in the Philippines

- United States (B/E Aerospace: Galleys and Interior fit-out; Moog Controls Corp.: Flight control actuation systems)
- Singapore (SIAEP: MRO: Base Maintenance; Line Maintenance; Engineering Training)
- Japan (JAMCO Philippines: Galleys, Panel Assembly and Interior fit-out)
- Germany (LTP: MRO: Base Maintenance; Line Maintenance; Dornier Technology: MRO; Assembly of sea planes)
- Philippines (FSPMI, AMC, PADC, Asian Aerospace)
- Hong Kong (MRO: Metrojet Engineering)

## Industry Data of Capabilities

With strong capabilities	Needed capabilities
<b>Parts Manufacturing</b> <ul style="list-style-type: none"> <li>Machining</li> <li>Plastic Injection</li> <li>Assembly</li> <li>Packaging and Delivery</li> </ul> <b>MRO</b> <ul style="list-style-type: none"> <li>Line Maintenance</li> <li>Base Maintenance</li> </ul>	<b>Parts Manufacturing</b> <ul style="list-style-type: none"> <li>Hard Anodizing; Sulfuric Anodizing; Chromic Anodizing; Vacuum Carburizing; Sub-Zero Heat Treatment; Induction Heating; Non-Destructive Inspection; Controlled Shot Peening; Brazing; Soldering</li> <li>Flammability Testing and Light Fastness Testing</li> </ul>

## INDUSTRY ROADMAP

### Vision

For the Philippines to be a major hub for manufacturing of OEM parts and allied services (MRO) for the global commercial aircraft industry

### Targets

- US\$ 2.57 billion exports of aerospace parts by 2022
- Employment of 14,900 by 2022 in aerospace parts manufacturing
- Integrated and complete supply chain of process capabilities/technologies and pool of qualified workers for the aerospace parts manufacturing and MRO industries

### Major Roadmap Strategies

#### Geographical Clustering

- Develop and promote Clark as Aviation/MRO/Training Hub
- Strengthen supply chain cluster of Aerospace Parts Manufacturing in CALABARZON, and develop a cluster of parts manufacturing in Clark eventually
- CAAP identification of potential airfields outside Manila as training hub: Region III and Central Visayas

#### Technology, Capability, Education and Trainings

- Support current aerospace product exports, upgrading and ten-year business plans
- Support investments on process capability building and training in the supply chain
- Equip companies and the supply chain for aerospace manufacturing accreditation such as AS9100 and NADCAP
- Strengthen integration of supply chain capabilities on CNC machining and metrology, surface processing of metals, non-destructive inspection, chemical test, met lab, gear manufacturing and metrology, and composites manufacturing
- Establish linkages with the government and private academe institutions to continually improve education and training in the areas of aircraft maintenance, CNC machining and manufacturing technology, surface treatment and chemical technology, heat treatment technology, gear manufacturing, AS9100 and NADCAP
- Support Countertrade and Offset Policy with PAF and DND to acquire technology transfer

#### Ease of Doing Business

- Support port expansion outside Metro Manila

### Priority Plan of Action (2016)

#### Reform Issues

- Geographical Clustering:
  - Develop and promote Clark as Aviation/MRO/Training Hub
  - Strengthen supply chain cluster of Aerospace Parts Manufacturing in CALABARZON, and develop a cluster of parts manufacturing in Clark eventually
  - CAAP identification of potential airfields outside Manila as training hub: Region III and Central Visayas

#### Administrative Bottlenecks

- Streamline import/export lead times and procedures for faster transaction processing in line with the needs of immediate business processes
- Fill the supply chain process capability gaps (both technology/facilities and trainings) to complete the supply chain integration and develop a pool of available competent human resources

#### Concrete Projects

- Participation of the Philippine delegation at the 2016 Singapore Air Show to promote local capabilities in the three segments of the industry: Aerospace Parts Manufacturing, Aircraft MRO and Aviation Trainings
- AS9100 Training Program to be implemented by DTI-BOI, DOST-MIRDC and AIAP in 2016
- DOST-MIRDC Gear Making Facility, and Die and Mould Solution Center
- Proposed LIPAD (Local Interventions for Philippine Aerospace Development) Program of the DOST-MIRDC with DOST-PCIEERD

## TECHNICAL WORKING GROUP

**BOI Sectoral Champion** : Executive Director Ma. Corazon H. Halili-Dichosa(BOI)

**Industry Champion** : Mr. John Lee (AIAP), and Mr. Wilfredo Estoque (AIAP/Moog Controls Corp.)

**Members** : BOI, AIAP (represented by the Tier 1-3 manufacturers and suppliers and MRO companies), ASAP (WCC Aviation Company), SIA Engineering Philippines (SIAEP), PATTS College of Aeronautics, CAAP, PADC, DOST-MIRDC, TESDA, CHED, CDC, CIAC, DTI-PITC, DND, DTI-EMB, DTI-BPS, DOST-PCIEERD

## Government Support

- The government through the BOI (Board of Investments) provides for both fiscal and non-fiscal incentives to encourage investments in the aerospace industry. This includes aerospace parts manufacturing, MRO, and trainings in support for aerospace. BOI facilitates implementation of the Aerospace Industry Roadmap.
- The AS9100 Training Program, a tripartite collaboration project of the DTI-BOI, DOST-MIRDC (Metals Industry Research and Development Center) and AIAP, being implemented this 2017, aims to develop and widen the local supply base of aerospace parts manufacturers with capabilities that are aligned to the international requirements of the aerospace parts manufacturing industry. This is to integrate the local aerospace supply chain to the requirements of the local and global aerospace OEM and MRO industries, with the goal of strengthening and deepening the integration of the Philippines with the aerospace global value chains (GVCs).
- DOST-MIRDC Facilities for Gear Making; LIPAD (Local Interventions for Philippine Aerospace Development) Program Proposal
- CAAP: PH obtained Category 1 upgrade – US FAA (2014); EU lifts aviation ban from PH carriers (2015)
- TESDA Trainings with Moog Controls Corp., SIAEP
- PADC: MRO Capabilities

## Philippine Advantages

- Cost-competitive, relatively young, English-speaking workforce, with a good percentage of engineering graduates every year
- The Philippines is considered as an ideal hub because it is equidistant (4-hour travel time) from all major Asian countries such as Thailand, Korea, Japan, Guam, Vietnam, Hong Kong, Singapore, Brunei, Malaysia, Shanghai and Xiamen in China and Taiwan.
- Given the 4-hour flying time constraint, the Japan-Singapore route maybe more efficiently served by the Philippines.
- Clark Airport as twin airport of NAIA to absorb additional demand capacity. CDC Master Plan (infrastructure) and CIAC (Clark International Airport Corporation) Master Plan from 2016 to 2032 (in four phases of development) in place.
- Presence of Tier 1 OEMs (Moog for flight control actuation systems; B/E Aerospace and JAMCO for interiors fit-out, panel assembly and galley manufacturing) and global MRO brands such as SIAEP and LTP
- Tier 2 supply base, although narrow, has proven competencies by delivering support to local Tier 1 OEMs. Also engages in direct export.

## Product Priorities

- Support current product exports; flight control actuation systems; galleys and equipment; interior fit-out and panel assembly
- Support manufacturing to upgrade into other product segments: wiring harness; oxygen systems; thermal and power management; lighting systems; potable water and vacuum waste system
- Support market upgrading
- Support functional upgrading: for the local aerospace parts manufacturing industry to supply into the more lucrative MRO market

## Investment/Market Opportunities

- Asia Pacific markets project new 14,330 new planes between 2015-2034
  - Migration of MRO services to Asia due to lower cost and better capacity/competency (human resources)
  - Increasing usage of composites leading to composite MRO (not solely for parts manufacturing)
  - MRO competition between airlines, OEMs, and third party service providers
  - MRO partnerships with OEMs
    - OEMs are aggressively looking for vertical integration into MRO services in Asia
    - OEMs going into full-service business model
  - Growing domestic and regional demand for local and international travel (both legacy and low cost carriers) translates to growing demand for MRO services
    - Driven by tourism and increasing intra-ASEAN movement of goods and people
    - PH to maintain Category 1 Status (local airlines can fly to US and EU skies)
    - 16.5% projected CAGR of MRO demand in PH from 2016-2022
  - If fuel prices stay low at US\$ 60/barrel, or further fall\*:
    - Airlines will favor older aircrafts to avoid increased ownership costs of new aircraft in the short run, leading to increase in MRO activities, mainly life extension programs
  - Choice of MRO capacity for A320neo & B737 MAX (both narrow bodies/single-aisle) looking at projected large orders and fleet commonality
  - Big Data to reduce production costs, optimize flight routes, and improve monitoring and maintenance of aircraft and equipment
- Source: Duke University, "The Philippines in the Aerospace Global Value Chain" (May 2016); Frost and Sullivan (2016)