THE PHILIPPINE AEROSPACE INDUSTRIES ROADMAP

INDUSTRY GROWTH AGENDA OVER A TEN (10) YEAR PERIOD (2013-2022)

PRESENTED BY:
THE AEROSPACE INDUSTRIES ASSOCIATION OF THE PHILIPPINES (AIAP)
INDUSTRY VISION

VISION

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

- To be the leading organization, enabling partnerships and serving as collective voice of the stakeholders, in promoting growth and development of the Philippine aerospace industry.

- Promote and establish business collaboration and integration to support competitiveness in product cost, quality and delivery.

- Promote a culture of excellence in manufacturing through technical competence in manpower, advanced manufacturing technologies, and advanced quality systems.

- Serve as liaison of the memberships in influencing government policies and development programs: partnering with government and established institutions to revitalize and elevate the state of Philippine aerospace industry.
STATE OF THE INDUSTRY
THE PRODUCTS

BOEING 787 PRIMARY & SECONDARY FLIGHT CONTROLS
THE PRODUCTS
AIRBUS A350XWB PRIMARY & SECONDARY FLIGHT CONTROLS
THE PRODUCTS

GALLEY EQUIPMENT
THE GROWING GLOBAL MARKET

New airplane deliveries by region

<table>
<thead>
<tr>
<th>Region</th>
<th>Airplanes</th>
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<tbody>
<tr>
<td>Asia Pacific</td>
<td>13,460</td>
</tr>
<tr>
<td>Europe</td>
<td>7,450</td>
</tr>
<tr>
<td>North America</td>
<td>7,550</td>
</tr>
<tr>
<td>Middle East</td>
<td>2,950</td>
</tr>
<tr>
<td>Latin America</td>
<td>2,950</td>
</tr>
<tr>
<td>C.I.S.</td>
<td>1,330</td>
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<tr>
<td>Africa</td>
<td>1,080</td>
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<tr>
<td>World Total</td>
<td>36,770</td>
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</tbody>
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Market value by region

<table>
<thead>
<tr>
<th>Region</th>
<th>$B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asia Pacific</td>
<td>2,020</td>
</tr>
<tr>
<td>Europe</td>
<td>1,040</td>
</tr>
<tr>
<td>North America</td>
<td>870</td>
</tr>
<tr>
<td>Middle East</td>
<td>640</td>
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<tr>
<td>Latin America</td>
<td>340</td>
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<tr>
<td>C.I.S.</td>
<td>150</td>
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<tr>
<td>Africa</td>
<td>140</td>
</tr>
<tr>
<td>World Total</td>
<td>$5,200B</td>
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AIRCRAFT OEM VALUE %

Components value as a % of aircraft value

- Airframe: 38%
- Engine: 27%
- Systems: 14%
- Avionics: 11%
- Interior: 6%
- Landing Gear: 4%

Sources: Wipro, Clearwater
SEA COUNTRY EXPORTS (1995-2010)

US$ Million

Source: World Trade Services
### COMPARATIVE INVESTMENTS (2010)

<table>
<thead>
<tr>
<th>COUNTRIES</th>
<th>AEROSPACE INDUSTRY</th>
<th>INVESTMENT/ CONTRIBUTION</th>
</tr>
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</table>
| Malaysia  | • Greater industry collaboration and synergy through an industry association  
            • Government to provide human capital development  
            • MMITI as the “one stop” center for facilitating industry investment | RM 3.1 billion or US$ 1billion |
| Thailand  | • Full support from the government and maximum incentives from the BOI  
            • Capable and efficient work force, cost effective inputs and other support industries  
            • 30 approved aerospace repair stations versus 224 international | US$ 234.4 million |
| Indonesia | • Has used state resources to develop aircraft industry since 1976  
            • PT. Dirgantara Indonesia, a state-owned factory, consists the aerospace industry  
            • Immediately went into aircraft production without slowly going through OEM, sub-assemblies or MRO | Rp.2 trillion ($234 million) |
| Singapore | • Number one MRO hub in Asia  
            • Adopted multi-prong approach to build full value chain clusters:  
              -build Seletar Aerospace Park  
              -attract investments from global aerospace major players  
              -assist SMEs to compete through business alliances , QMS, and capability development programs  
              -air shows and supplier conferences  
              -establish an R & D cluster  
              -develop engineering talent through education | US$4.6 billion |
# PHILIPPINE REVENUE PROJECTIONS

For the Ten-Year Period (2013-2022)
(In USD Million)

<table>
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<tbody>
<tr>
<td>OEM</td>
<td>385</td>
<td>592</td>
<td>779</td>
<td>958</td>
<td>1,120</td>
<td>1,176</td>
<td>1,235</td>
<td>1,297</td>
<td>1,361</td>
<td>1,429</td>
<td>10,332</td>
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<tr>
<td>MRO</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
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</tr>
<tr>
<td>Employment Generation</td>
<td>2,200</td>
<td>3,600</td>
<td>4,500</td>
<td>5,600</td>
<td>6,500</td>
<td>6,800</td>
<td>7,200</td>
<td>7,500</td>
<td>7,900</td>
<td>8,300</td>
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</tbody>
</table>

Notes:

1. Source: Five-year data from consolidated business projections. Tier 1,2,3 suppliers.
2. MRO Projections not included.
3. Assumed increase of five percent (5%) per year starting 2018.
PRODUCT VALUE CHAIN ANALYSIS

SOURCE COUNTRIES: USA, CAN, UK, SG, EU
ASIAN SUPPLY CHAIN
Singapore: ACP, STK, HTK, ATC
Singapore: SETSCO, STK, ACP, HTK

T1 MOOG, BE, JAMCO
AAPMC, API
FSPMI, ONA, PPI, JFS

T2 MOOG, BE, JAMCO
MOOG
MOOG
MOOG, BE, JAMCO
MOOG, BE, JAMCO

T3 KAPCO, MIR DC
MIRDC

LEGEND:
Gaps

TRANSPORT & LOGISTICS

Fine Machining (Grind, hone, lap)
Assembly
Packaging and Delivery
POTENTIAL COST REDUCTION

- Cost Reduction
  - A. Local Distribution of Material
  - Local Special Processing
  - Local Finishing Processes

19%
CHALLENGES
PRODUCTION AND PROCESS CAPABILITY

- High-end machine tools and metrology equipment
- Fine Machining (hone, fit, lap, extrude hone, deburr equipments)
- Heat treat, surface treatment processes
- Gear manufacturing
- Non-destructive inspection (NDI) and plating/metallurgical testing
- Gen. functional testing for compliance to aerospace requirements
- Chemical test / Solution test compliant to aerospace requirements

HIGH CAPITALIZATION ON MACHINE TOOLS AND METROLOGY EQUIPMENTS

SUPPLY CHAIN INTEGRATION

- Raw material supply/distribution (MIL/AMS Specs)
- Transport and import/export turn-around
- Complete process capability in the supply chain
- Toolings & chemical supply distribution
TRAINING AND EDUCATION

- CNC machining/programming and advanced metrology
- Surface treatment and testing technology
- Heat treat and testing technology
- Gear manufacturing and metrology
- Advanced Metrology
- AS9100 accreditation training
- NADCAP accreditation training

AVAILMENT AND IMPROVEMENT OF GOVERNMENT PROGRAMS AND INCENTIVES FOR POTENTIAL INVESTORS ON PROCESS CAPABILITIES

- e.g. PEZA /BOI/DTI/DOST/MIRDC/TESDA
WHERE GOV’T CAN HELP
WHERE GOV’T CAN HELP

PRODUCTION AND PROCESS CAPABILITY

- Enlist provision of government incentives for high capital investments intended for aerospace manufacturing.
  - e.g. long-term leases, lease subsidies, tax holidays, zero interest, credit facility provision, loan guarantees
- Encourage government to spearhead provisions for training and development of critical processes to bridge gaps in the supply chain.
  - e.g. NDI / surface treatment / metallurgical test facility / gear manufacturing / heat treatment / precision machining and metrology / special testing per AS standards
SUPPLY CHAIN INTEGRATION

- Encourage development of local businesses conforming to aerospace standards e.g.
  
a) Raw material distribution / trading (steel, aluminum, castings, forging, etc.)
b) Chemical supplies, i.e. oils, lubricants, plating chemicals
c) Tool supplies and refurbishing, i.e. cutting tools, tool coating, tool grinding
d) Plating and coating process (anodize, alodine, CAD plating)
e) Heat treat processes
   - Nitriding
   - Vacuum heat treat with subzero
   - Carburizing
WHERE GOV’T CAN HELP

TRAINING/ EDUCATION

- Continuous improvement on existing programs for CNC machining and manufacturing technology and advanced metrology (TESDA, MIRDC, DOST)
- Revival of surface treatment, chemical and, heat treat technology training programs (TESDA, MIRDC, DOST)
- Provision for accreditation trainings on aerospace quality management systems and certifications, i.e. AS9100, NADCAP
- Creation of training programs and training facility for gear manufacturing and metrology

GOVERNMENT PROGRAMS AND INCENTIVES

- Information drive on existing government programs and incentives, e.g. PEZA, BOI/DTI/DOST/MIRDC/TESDA
- Continuous review and improvement of policies and incentives supportive of the aerospace industries.
- Inclusion in government promotions and programs i.e. advertisements, trade fairs, exhibitions / conferences, counter-trade
- Investment missions / promotions for other OEM suppliers
WHERE GOV’T CAN HELP

Policy Reforms

• Inclusion of Aerospace Manufacturing as a pioneering industry with extension of Tax Holidays from 4-6 years to 6-8 years in 2014 Investment Priority Plan (IPP)

• For government institutions to fill out the supply chain gaps through investments on training & development on process capabilities, e.g. surface finishing, special testing, gear manufacturing, and NDI.

• For government to support training programs and certifications related to Aerospace Manufacturing.

• Improve/create tax and investment incentives to those who will qualify to 2014 IPP under Aerospace Manufacturing to encourage more investors and players.

• For government to maintain status of the Philippines as a Category 1 Country by International Aviation Regulatory Standards.
WHERE GOV’T CAN HELP

- **Clearing Administrative Bottlenecks**
  - Streamline import/export lead times and procedures for faster transaction processing in line with the needs of the business processes.
  - Make government programs and incentives more attractive to entice investors to come in or for buyers to look at Philippines as a country source.
  - Fill the supply chain process capability gaps to complete the supply chain integration.
  - Identify logistical bottlenecks and propose improvements.
Projects

- Support Industry Accreditation to Aerospace Standard (AS 9100, NADCAP, etc)
- Encourage Investments and Trainings on NDI, surface finishing, gear manufacturing, composites manufacturing and other special processes to fill the supply chain gaps.
- Provide the same trainings and investments thru DOST/MIRDC funded programs to fast track development of services not available in the supply chain.
REVENUE GROWTH POTENTIALS
REVENUE GROWTH POTENTIALS

REVENUE PROJECTIONS AND POTENTIALS
In US$M

With Positive Program Intervention (Dreamline)

Private Lead
REVENUE GROWTH POTENTIALS
SEA COUNTRY EXPORTS & PROJECTIONS (1995-2022)

Source: World Trade Services
PROGRAMS IN PLACE SUPPORTING THE LOCAL MANUFACTURING INDUSTRIES
Capacity Building for Competitiveness of the Metals & Engineering Cluster (CAIMTEC) of CAR for the localization of Industrial & High Precision Technology Parts

- The program was spearheaded by the Metals Industry Research and Development Center (MIRDC) with Ms. Mercedita G. Abutal as Project Leader
- It was implemented from April 2013 to March 2014 with various programs and projects as listed on the next slide.
SUPPORT PROGRAMS FOR THE LOCAL INDUSTRIES

- CNC Milling / CNC Turning Trainings
- Basic Machine Shop Operations (Benchwork / Deburring)
- Advanced Machine Shop Operations
- Metrology Trainings and Measurement and Calibration
- Awareness Training on AS9100C
- Computer Aided Design and Development Training (CAD)
- Productivity Through Effective Supervision Trainings
SUPPORT PROGRAMS FOR THE LOCAL INDUSTRIES

1. CAPABILITY ASSESSMENT OF ADDITIONAL BENEFICIARY FIRMS
In coordination with industry associations, (i.e. AIAP and MIAP)

2. CONDUCT OF EIGHT (8) TECHNICAL TRAININGS

3. IMPROVEMENT OF PRODUCTION MANAGEMENT SYSTEM
Development of Computerized Job order Information System (JOIS)

4. CONSULTANCY
> Consultancy on Production Management System
> Consultancy on Productivity Improvement
5. **TRAINING-CUM-PRODUCTION ACTIVITIES**
Refurbishment of DOST-PSTC building in La Trinidad as CSF and provision of 3 axis **CNC Vertical Machining Center** as shared facility.

6. **PROCESS RESEARCH AND ADAPTATION**
Research on processes to localize production of selected components, parts and/or equipment (e.g. machining / metal finishing processes).

7. **BENCHMARKING/ STUDY VISIT/SHORT-TERM COURSES**
Visit to [Taiwan](#), Singapore or other country to establish linkages and identify best practices on industry cluster development, TBI and programs for the development of aerospace industries.
RECOMMENDATIONS
At this stage of the development, we propose the following:

- We seek continued policy & administrative guidance from the BOI Industry Development Council thru regular status reviews of AIAP activities.
- On a technical level, we propose to partner with DOST-MIRDC to spearhead the industries development course, in planning and implementation of AIAP programs similar to successes achieved with related industry associations, particularly MIAP & PDMA.
- The DOST-MIRDC / AIAP partnership should pave the way for government funding appropriations where critical programs in the development of the aerospace industry are needed particularly on process capability building, supply chain integration, and training & education.
CONCLUSION
A successful and sustainable aerospace manufacturing industry must fully engage the cooperation and support of the government.

The aerospace industry is in a rare opportunity for the country to take advantage of, with the confluence of events in the growth of the Asian aerospace industry.

This development is a most opportune time for the Philippines to regain its image as a major technology contributor.
“This is an important project because it marks a new kind of manufacturing. We are moving up the value chain, and today marks the foothold we have secured in the aerospace supply sector.”

October 3, 2012 – Excerpts from President Benigno Aquino’s speech during the Inaguration of B/E Aerospace facility in Tanuan, Batangas
Industry road map is submitted to map out a holistic strategy to fully optimize all resources under a government-private partnership arrangement.

THANK YOU!