Today’s Discussion

1. About SH&E
2. Lessor Perspectives
3. Acceleration of PMA Adoption
Section 1

ABOUT SH&E
SH&E is one of the world’s largest and most experienced aviation and aerospace consulting firms

- 46 year history of delivering value to our clients
- More than 6,000 assignments for a global client base of airlines, airports, governments, investors, lenders, lessors, MROs, OEMs, etc.
- Aviation professionals with in-depth experience and aviation expertise in 5 major practices
- Proven strength in the Aviation Maintenance & Engineering and MRO industry
- Unmatched resources, including proprietary databases and intellectual capital
- Primary Offices in New York, Boston & London
- SH&E is an ICF International company; ICF is a global leader in transportation policy and climate change consulting services
SH&E’s Financial & Technical Services (FTS) Practice
– Major Products and Services

**Technical Consulting**
- MRO market research & analysis
- Fleet maintenance planning & forecasting
- Supply Chain Management & Strategic Sourcing
- Performance benchmarking & operational improvement

**Appraisal Services**
- Tangible asset valuations
- Residual value forecasting
- Lease analysis

**Asset Management**
- Sale or lease of assets
- Lease management
- Maintenance management
- Technical inspections

**Investment Support**
- Business Plan Development
- M&A commercial due diligence
- Enterprise valuation
- Securitization support
Section 2

LESSOR PERSPECTIVES
SH&E recently surveyed lessors, operators, and appraisers to understand the different views toward PMA parts

- **Lessors**
  - Respondents represented a diverse group with regard to fleet size, asset type focus, business model, and geographic reach, to identify differences in views on alternate parts
  - Respondents cumulatively own/manage 2,500 aircraft, or approximately 33% of the world’s leased fleet

- **Operators**
  - Respondents included those from multiple divisions within the airlines (technical, procurement, finance, quality, etc.) to understand the different views on alternate parts
  - Respondent set included 15 airlines, operating in 12 countries including both network and low cost carriers with differing levels of internal maintenance and engineering capabilities

- **Appraisers**
  - Respondents included four appraisers from three different countries
  - Respondents ranged from individual ISTAT appraisers to larger firms
Many operators expressed a desire for increased use of PMA parts, but identified a number of concerns or limitations.

- Airlines agree that safety, reliability, or ‘bogus parts’ are not an issue
  - Few have safety/technical concerns, but few want to be early adopters of engine hot section / critical PMA parts

- Lessor contract restrictions are cited by operators to be major factors limiting the use of PMA parts

- Other factors limiting PMA use:
  - Existing OEM agreements / restrictions
  - OEM technical support / warranty issues
  - Asset value concerns
  - Technical staff to evaluate the parts
  - Configuration management complexity

Note: Weighted average response of all lessor respondents. Rank 1 (not important) - 5 (very important).
Source: SH&E Survey
Lessors own 39% of the worldwide fleet of active commercial jet aircraft; and as such, play a large role in setting PMA policies.

Percentage of Active Fleet on Operating Lease

- **Africa**: 38%
- **Asia / Pacific**: 42%
- **Europe**: 51%
- **Middle East**: 39%
- **North America**: 26%
- **South America**: 59%

**World Average % of Fleet on Operating Lease: 39%**

Source: ACAS, Jun-10
SH&E’s survey confirmed lessor resistance to PMA parts, primarily due to concerns about remarketability.

- Remarketability (both lease and sale) concerns are the leading factor that drives the leasing community’s aversion to PMA parts.

- Residual value impacts, regulatory concerns, and operator restrictions were also cited as being important, but mostly in respect to how they potentially affect the ability of the lessor to place or sell their aircraft.

Note: Weighted average response of all lessor respondents. Rank 1 (not important) - 5 (very important).
Source: SH&E Survey
Most lessor’s default policy (formal or informal) is to not permit PMA parts.

- Approximately 40% of lessors surveyed had an actual formal policy toward PMA parts; however, most respondents have an informal policy precluding the use of PMAs.
- The majority of formal policies distinguish between airframe and engine parts.

**Lessor Policies Regarding PMA Parts**

- No Policy: 33%
- Informal | Try Not to Allow: 28%
- Formal | Airframe PMA Allowed: 11%
- Formal | No Engine PMA: 22%
- Formal | No PMA: 6%
With the default policy being to not permit PMA parts, only airlines that ask for relief will be granted relief.

### Lessors

**Frequent Requestors of PMA Usage Consent**
- North American legacy airlines
- European legacy airlines
- Operators of older passenger aircraft
- Operators of cargo aircraft

**Infrequent Requestors of PMA Usage Consent**
- Smaller network airlines
- Low cost carriers
- Airlines the outsource their MRO activities
Lessors will engage in transactions involving assets with PMA parts, if the overall transaction makes financial sense.

Selected Examples of Leases Most Likely to Permit Usage of PMA Parts

- **Finance Leases:**
  - The lessor does not take possession of the asset for a finance lease, nor under normal circumstances have remarketing concerns.

- **Sale-Leasebacks:**
  - The sale-leaseback market can be competitive at times, and in such times, airlines hold significant leverage.

- **Long-Term Operating Leases:**
  - The economics of long-term operating leases are such that the lessor is less dependent upon remarketing or residual values.

- **Older Aircraft:**
  - Leasing older aircraft can be challenging; lessees seeking to lease such assets may have leverage to negotiate the usage of PMA parts.
1. Explicit Exclusion of PMA Parts
   - “No DER parts or PMA parts shall be installed…”

2. Explicit Exclusion of PMA Parts, Unless with Specific Lessor Consent
   - “No PMA replacement or DER repaired parts shall be installed unless Lessee has obtained Lessor’s prior written consent”

3. Explicit Exclusion of PMA Parts, Except for Consumables
   - “No DER parts or PMA parts shall be installed … except for consumable parts or as otherwise agreed by Lessor”

4. Explicit Exclusion of PMA Parts, Except to Replace Existing PMA
   - “…if the Part being replaced is a PMA Part, then Lessee may replace such Part with a PMA Part without the prior consent of Lessor”

Many older leases are silent as to PMA usage. Specific reference to PMA parts has become more common, and evolved with greater industry awareness and the development of more critical parts.
Many lessors are open to exploring PMA parts through alternate business models, though with caveats and practicality concerns.

- Nearly 90% of the lessors indicated they would consider allowing some PMA parts if the lessee would remove them before aircraft redelivery.
  - Lessors mostly concerned with aircraft upon return.
  - Lessee credit quality is the essential issue.

- Approximately 60% of lessors said they would entertain sharing the savings from PMA parts.

**Explore use of PMA parts if removed at expiry?**
- Yes: 35%
- No: 10%
- Yes: Credit Quality (40%)
- Yes: Aircraft Age (10%)
- Yes, Part Type (5%)

**Explore use of PMA parts if Lessee shares cost savings?**
- Yes: 44%
- No: 28%
- Yes: Credit Quality (11%)
- Yes: Aircraft Age (11%)
- Yes, Part Type (6%)
Section 3

ACCELERATION OF PMA ADOPTION
The survey findings make clear that the resistance to PMA parts is a self-fulfilling cycle

- Lack of regulatory clarity across jurisdictions, operator resistance, and uncertainty over residual value impact creates a restricted market;

- In turn, lessors are reacting to the reality of market – unless they have full flexibility to place (or sell) assets with PMA parts with any airline, in any country, they will continue to restrict their use wherever possible;

- Ultimately, without explicit participation of this large and growing source of aircraft financing, operator resistance and perceived value degradation will continue.

While airlines are going to have to drive further demand for PMA parts, if a number of areas are addressed by industry, the adoption of PMA parts may be accelerated...
A number of strategies exist that may be explored with the lessors to accelerate the adoption of PMA parts

- Communicate to lessors the specific scenarios where PMA parts can result in notable reduced maintenance costs for the operator, and/or relatively less risk for the lessor (financial leases, long term operating leases, older aircraft, etc.)

- Develop financial incentives for lessors:
  - Cost sharing (lessee → lessor)
  - Incentive payments (PMA manufacturer → lessor)
  - Etc.

- Educate lessors on ease of transition and regulatory acceptance
  - How big is the market for aircraft which have PMA parts?
To accelerate adoption of PMA parts, the industry must expand beyond the lessors, to include regulatory issues

- Increase industry visibility into, and clarify the current policies towards PMA in each jurisdiction so that all stakeholders (lessors, operators, appraisers, MROs, industry trade groups) have a proper understanding

- Facilitate the acceptance of PMA programs for regulators without extensive knowledge or capabilities

- Create regulatory harmony across jurisdictions to allow for seamless transition of aircraft and engines that utilize PMA parts
Demand for PMA parts by operators must continue to be stimulated, and the operators must be supported by the industry.

- Foster the development of PMA parts through:
  - Airline alliances (Oneworld, SkyTeam, Star Alliance)
  - Airline associations (ATA, ALTA, AACO, AEA, etc.)

- Facilitate the acceptance of PMA programs for operators without extensive engineering capabilities

- Encourage enhanced interaction between airline technical and finance department when negotiating leases

- Provide operators with favorable lease contract language
Finally, an aftermarket for non-consumable PMA parts must be developed so as to support asset residual values.

- By developing an outlet for secondary material, the residual values of assets with PMA parts would be supported:
  - Part-out companies would pay more for the assets
  - Companies that sell their assets to the part-out companies would realize value for the PMA parts
  - Appraisers would no longer decrease value of assets with PMA parts

- PMA manufacturers could address this market need through guaranteed buy back programs
  - PMA manufacturers would then have the option of repairing unserviceable parts, and then re-selling the used serviceable parts
In summary, while airlines will need to drive further demand for PMAs, industry can take action to facilitate the growth.

**Lessor Perspectives**
- Aircraft remarketability is the primary concern of lessors regarding PMA parts
- If lessors could remarket aircraft with PMA parts as easily as those without, and for the same sale price or lease rate, they would permit them

**Industry Strategies**
- As lessors are reacting to the reality of the market as they see it...
- Industry efforts will need to be made in many areas to accelerate the adoption of PMA parts
  - Lessors
  - Regulatory
  - Operators
  - Aftermarket