Are OEMs doing enough to reduce operator DMC, or has it been left up to 3rd parties to lead the innovation?

Gavin Simmonds – General Manager – AJW Technique
A320 example of DMC

$Spend

Years in Fleet

- C, 4C, 8C
- Line
- Mods
- Rotable Units
- LLP
- Major Components
- Engine Visits
Areas included in presentation

$SPend vs Years in Fleet

- C, 4C, 8C
- Line
- Mods
- Rotatable Units
- LLP
- Major Components
- Engine Visits

$SPend vs Years in Fleet
The parties that influence component DMC

- Operators
- OEMs
- 3rd Parties
Operator

Private/Business

Legacy Carrier

Low Cost Carrier/LCC

New non LCC
Operator – Private/Business

- Follow OEM
- Cost is mainly secondary, smaller fleets therefore less useful reliability profiling
- Tendency to be covered by ‘Nose to Tail’ manufacturers’ service.
Operator – Low Cost Carriers

- DMC is integral to how they operate
- It is embedded in company culture. The joining of individual silos.
- Scheduled vs unscheduled maintenance
- Proactive in engaging non-OEM ‘original fit’ providers
- Not PMA/DER averse
- Have a better understanding of total cost at all levels of the organization

“Because of our size, we have good leverage with OEMs, however much of this is enabled due to third parties” easyJet
Operator – Large Legacy Carriers

- Total cost DMC is often only considered at a higher level in the company hierarchy
- Reliability is reviewed through history: MTBF info
- Don’t review with external help except on a project basis
- Specific strategic projects, not an embedded culture
Operator – Newer carriers

- Competitive through reliability and DMC focus from the beginning
- Not afraid to pave the way with innovative technologies/build partnerships with providers that ‘do it better’
- Invest in the right future
Aircraft Manufacturer e.g.
- Airbus
- Bombardier
- Boeing
- Embraer

Major Equipment Manufacturer e.g.
- Hamilton
- Goodrich
- Thales
- Honeywell
- Rockwell Collins
Agility hindered by equipment OEM reliance

A history of being reactive instead of proactive (some exceptions)

For airline industry, Only listen to the big customers

Fixed wing playing catch up with other industries

Legacy fleets left behind

Innovation now being maximized for the new generation of aircraft - 787/350
Large fleet operators get special treatment – OEMs rule these relationships

Smaller fleets more entrepreneurial, ride the wings of change

Don’t always stay in tune with the market – we know it changes by day

Only look into own fitted equipment – to be expected

Beginning to understand the sense of strategic partnerships
So where do the 3rd parties come in?

- Reinvent how things are done
- Fresh set of eyes
- Efficiency gains in every way
- Learn from other industries
- At the forefront of new technologies

Copy Houses

External Tech Providers

Quality MROs

- Reverse engineer
- Lower piece part cost
- Increase reliability

- Work with OEM not against
- Sub /unit / platform level
- Living lean = they have to sweat their assets
- Look at total cost as they are a service provider
The natural integrator

- Soft life offerings

Solutions that are proposed quickly and efficiently not just in response, but from internal research – PCB example

Market forces will inevitably force OEM to reconsider, however 3rd party influence is the essential catalyst
Example

PCB Assembly
# A320 removals – example

<table>
<thead>
<tr>
<th>PN</th>
<th>DESCRIPTION</th>
<th>RANKING</th>
<th>NOTES</th>
</tr>
</thead>
<tbody>
<tr>
<td>3250-81</td>
<td>BALLAST</td>
<td>1</td>
<td>Diodes V1 and V2 account for 80% of removals.</td>
</tr>
<tr>
<td>72184101</td>
<td>WATER HEATER</td>
<td>2</td>
<td>DESCALING - regular intervals dependant on water hardness</td>
</tr>
<tr>
<td>3907130402</td>
<td>DISPLAY UNIT</td>
<td>3</td>
<td>HIGH NFF RATE on premature removals. Common intermittent faults, AJW investigate - reliability program</td>
</tr>
<tr>
<td>6774E010000</td>
<td>VALVE-BLEED PRESSURE REGULATING</td>
<td>4</td>
<td>IN THE EVENT OF OVERHAUL or purchase ensure unit COMPLYs WITH SIL</td>
</tr>
<tr>
<td>89-01-07122</td>
<td>HANDSET-CABIN</td>
<td>8</td>
<td>MISHANDLING - common damage to the box, overstretching of the cord</td>
</tr>
<tr>
<td>ACP2788AB04</td>
<td>AUDIO CONTROL PANEL</td>
<td>9</td>
<td></td>
</tr>
<tr>
<td>B372BAM0511</td>
<td>SPOILER ELEVATOR COMPUTER</td>
<td>10</td>
<td>Power supply failures common at start-up. Relay changes can be effective on older unit (more than 10 years)</td>
</tr>
<tr>
<td>066-50007-0232</td>
<td>TRANSCEIVER - RADIO ALTIMETER</td>
<td>13</td>
<td>RF MODULE main cause of removals</td>
</tr>
<tr>
<td>071-50026-0400</td>
<td>RADIO ALTIMETER ANTENNA</td>
<td>14</td>
<td></td>
</tr>
<tr>
<td>3906130302</td>
<td>DISPLAY UNIT</td>
<td>18</td>
<td>HIGH NFF RATE on premature removals. Common intermittent faults.</td>
</tr>
<tr>
<td>ACP2788AB05</td>
<td>AUDIO CONTROL PANEL</td>
<td>19</td>
<td></td>
</tr>
<tr>
<td>C12850AC02</td>
<td>FLIGHT CONTROL UNIT</td>
<td>20</td>
<td>PUSH button failures are common, check date codes on repair and replace older PB's.</td>
</tr>
<tr>
<td>2980292100100</td>
<td>WATER FAUCET (WITHOUT HOSES</td>
<td>24</td>
<td>DESCALING - regular intervals dependant on water hardness</td>
</tr>
<tr>
<td>3945122506</td>
<td>ELEVATOR AND AILERON COMPUT</td>
<td>52</td>
<td>Common NFF due to connector pin contamination caused by pollution. The final fix for contamination was accomplished by VSB 394512B-27-027, the cleaning was SB 21 both are required. Relay changes available but expensive from OEM</td>
</tr>
<tr>
<td>64771-001-001</td>
<td>BEVERAGE MAKER</td>
<td>53</td>
<td>DESCALING - regular intervals dependant on water hardness</td>
</tr>
<tr>
<td>67262-001-003</td>
<td>OVEN</td>
<td>54</td>
<td></td>
</tr>
<tr>
<td>8055515-4501</td>
<td>DATA PRINTER-MULTI USE</td>
<td>55</td>
<td>PAPER JAMS - common cause of removal. Use of PMA paper reduces reliability.</td>
</tr>
<tr>
<td>2.98029E+12</td>
<td>WATER FAUCET ASSY-WITH HOSES</td>
<td>68</td>
<td>DESCALING - regular intervals dependant on water hardness</td>
</tr>
<tr>
<td>2LA455010-00</td>
<td>LIGHT-ANTI COLLISION</td>
<td>69</td>
<td></td>
</tr>
<tr>
<td>411-0001-137</td>
<td>COFFEE MAKER</td>
<td>70</td>
<td>DESCALING - regular intervals dependant on water hardness</td>
</tr>
<tr>
<td>ST3100-23-10</td>
<td>HANDSET</td>
<td>78</td>
<td>MISHANDLING - common damage to the box, overstretching of the cord</td>
</tr>
<tr>
<td>ST3100-23-32</td>
<td>HANDSET</td>
<td>79</td>
<td>MISHANDLING - common damage to the box, overstretching of the cord</td>
</tr>
<tr>
<td>35-0L5-1005-08</td>
<td>BATTERY CHARGER UNIT</td>
<td>84</td>
<td>SB 35-0L5-24-011 recommended to improve robustness of unit to short power interrupts</td>
</tr>
</tbody>
</table>
Examples of technological service offerings

- HUMS – Real time monitoring, pioneered in rotary market in the late 80’s.
  - Only now being fitted as standard across fixed wing on new Gen.

- Inflight reliability and health monitoring

- Revolutionary line maintenance practices
Common misconceptions/recommendations

PMA is of lesser quality – FALSE in majority of cases

PMA reduces value – Lessors actually prohibit the use of PMA through fear of value reduction, with the exception of safety critical and engine components value remains unchanged long term.

Don’t forget DER – When labor outweighs parts, DER saves $$$ though some OEM’s are not averse to changing how we do things when provided with all of the data.

Suggested reading IATA guidance material and best practices for PMA and DER repairs. Also review 2008 BASA– 8312/09
The Solution – The Goldilocks zone

3rd Party

OEM

Operator
Moving forwards – the choices?