

# MRO MANAGEMENT<sup>®</sup>

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## Worth the wait?

Fixing the 787

## Changing shape

JAL Maintenance

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# A cut above

In three years, the Aircraft Fleet Recycling Association has made substantial progress in developing procedures to deal safely and profitably with the problem of elderly aircraft disposal. **Ian Harbison** attended a demonstration at Châteauroux

In 2005, 11 organisations from various sections of the aircraft industry agreed to work together to develop a code of conduct and best management practices for aircraft dismantling and materials recycling. At a meeting at the Châteauroux Air Centre in France, they formed the Aircraft Fleet Recycling Association (AFRA). The original 11 members were Air Salvage International, Adherent Technologies, Bartin Group, The Boeing Company, Chateauroux Air Centre, Europe Aviation, Huron Valley Fritz, Milled Carbon, Rolls-Royce and WINGNet.

AFRA has grown by 360% from its founding 11 members to 40 members from 10 countries (see Table 2). The association now has 100 years

of combined aircraft recycling experience, including stakeholders from all the different sectors of the aircraft dismantling and recycling community – from aircraft manufacturers, engine makers and aircraft dismantlers, to parts distributors and materials recyclers. In addition, other companies and the academic community are working to develop new recycling technologies.

One of AFRA's key accomplishments to date has been the development of its Best Management Practice (BMP) Guides. The first BMP Guide, Version 1.0, was published in August 2008 and dealt specifically with the best practice and minimum performance standards around

airframe dismantling. The Guide has 45 separate best practice elements covering a whole range of dismantling and recycling issues. It was drawn together by an AFRA working group both from documented evidence and practical experience in areas such as the location, management processes and security of dismantling facilities, through to the keeping and maintenance of reference manuals and records, ending at the tagging and shipping of the recovered parts and the proper management of recycled material.

Version 2.0 of the BMP Guide was published in May 2009 and has added engine dismantling. There is also a clear definition of an 'airworthiness event', setting out in detail the ▶



(all photos: Ian Harbison)

circumstances under which the industry feels it is appropriate to convey information about the past history of parts.

Following the BMP Guide is a key part of acquiring AFRA accreditation, which is currently held by 11 members (Air Salvage International, Bonus Tech, Europe Aviation, Evergreen Trade, Orange Aero, P3 Aviation, Southern California



Sting in the tail – the horizontal stabiliser of this Boeing 737-200 is severed by a circular saw

Aviation and Volvo Aero Services), with a number of other organisations currently in the process of being accredited. Accreditation is increasingly producing added value as asset owners are actively seeking out AFRA accredited members due to their reputation for environmental excellence, says Martin Fraissignes, Executive Director of AFRA and General Manager of the Châteauroux Air Center.

Of the 400 to 450 aircraft that are scrapped and disassembled globally each year, around one third are parted out and disassembled by AFRA member companies, which also holds around half of the legally parked (not dumped) aircraft at their facilities. The AFRA members' work produces more than 30,000 tons of aluminium and 1,800 tons of other speciality alloy metals for recycling each year, as well as 600 tons of parts.

According to Bill Carberry, Strategy Analyst/Project Manager at Boeing, and generally acknowledged as one of the founders of AFRA, there are 5,900 commercial aircraft to be retired before 2028 (see Table 1), while consultancy firm

Ascend reckons there are 2,700 already grounded. With a total of 8,000 to 10,000 aircraft to be disposed of in the next 20 years, there is clearly a pressing need that the facilities and technologies are available to allow them to be recycled efficiently.

However, it is not just old aircraft that are being recycled; Carberry explains that the first pre-production Boeing 787 barrel has been dismantled and the material distributed to a number of recyclers. Some of the material has been reused in a proof of concept moulded armrest (for demonstration purposes only, not for flight). Work is in hand to develop technology that will align the recycled fibres to give the required density and structural strength in a project between AFRA members Milled Carbon and the University of Nottingham.

As interiors make up 30% of an aircraft's weight, recycling these materials could provide valuable weight saving (and consequently, a reduced fuel burn) in the future. It would also avoid the fate of most scrapped interior items at the moment. Made out of fibreglass, they have



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no commercial resale value and generally end up in landfill.

He comments that the use of exotic materials is increasing in airframes and engines as well as interiors and some recycling will be difficult in the future. In the meantime, Boeing has a number of projects that will see carbon fibre recycled from different facilities, and this is set to increase.

Other development programmes include the high-speed processing of aluminium scrap, with a laser pulse producing vapour from the metal that can be analysed to determine the make-up of the alloy. With a scanning system registering the position of each piece of metal as it passes on a conveyor, it can be pushed off the belt into the correct bin. Removing the metal from an aircraft's complex wiring system is also being considered.

These initiatives could help push the recovery of materials from the current 60 to 65% towards the AFRA target of 90 to 95% by 2016.

As the venue for the first AFRA meeting, it was appropriate that Chateauroux was the

**Table 1: 5,900 aircraft for disposal by 2028**

By configuration		By region	
Single aisle passenger	48%	North America	40%
Twin aisle passenger	20%	Europe	22%
Regional jet	18%	Asia Pacific	15%
Freighter	15%	Rest of World	22%

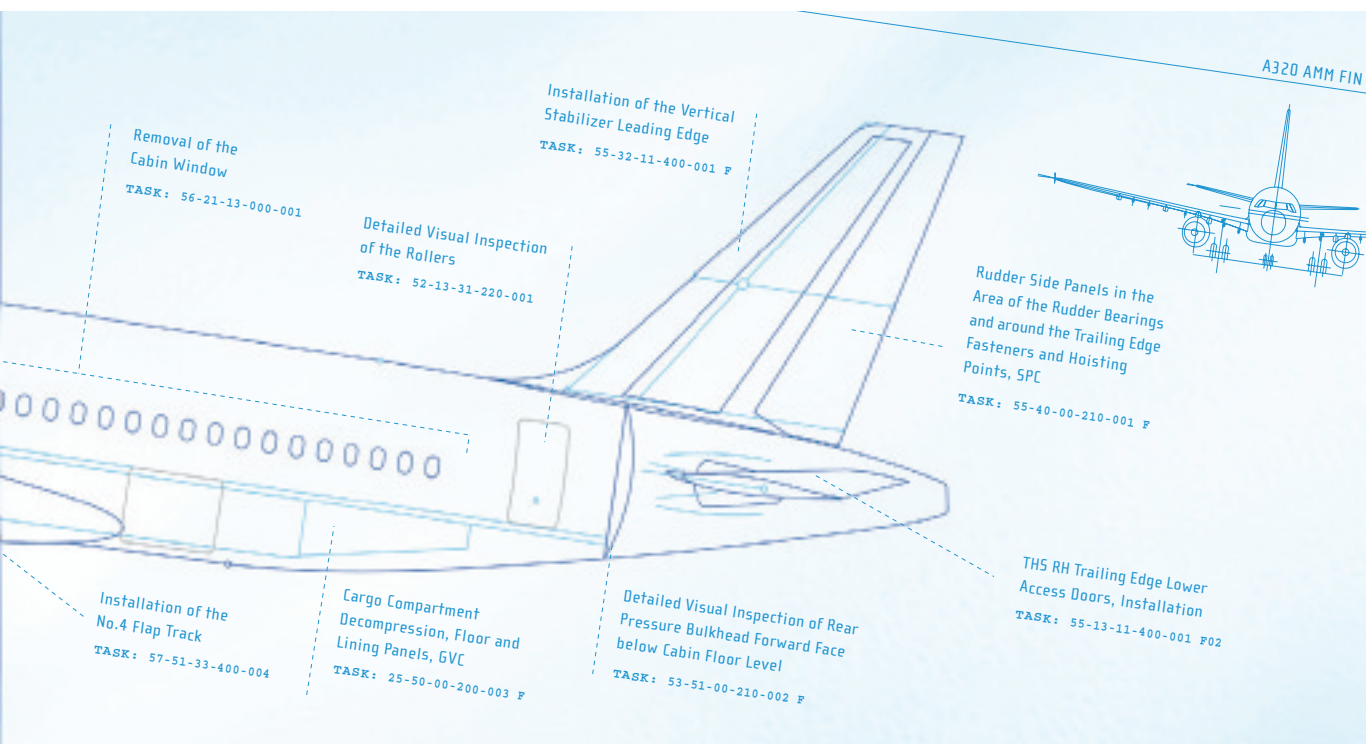
*(source: Boeing)*

venue for a briefing and demonstration on aircraft dismantling and recycling. Europe Aviation has a maintenance base on the airfield with one of the hangars being used to start the dismantling process. When the aircraft has been stripped of useful parts, it is towed to a secure area on the other side of the runway where it is reduced to scrap metal. So far, it has processed over 30 aircraft.

At the time of *MRO Management's* visit, a 28-year old Boeing 747-200 freighter had just arrived and was on the first day of the process. It will take the partners at Châteauroux (Europe

Aviation, JMV Aviation and Bartin Group) around three weeks to recover all of the useful components and four weeks to break it up. Included in this is the removal and safe disposal of all hazardous items, whether chemical, pyrotechnic or material.

Karl Rickard, VP Sales & Marketing for JMV Aviation, explained that, if his company purchased an aircraft for \$2 million, it expected to make at least \$3 million from the recovered parts. This included the cost of removing and recertifying the components. He said that plenty of older aircraft, particularly early model Boeing 737s, ▶



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**Table 2: AFRA members**

<b>France</b>	
Bartin Group	Aircraft disassembly and metals reclamation
Châteauroux Air Center	Aircraft storage
Europe Aviation	Aircraft maintenance
Safran Group	Aircraft engine manufacture
<b>Italy</b>	
Societa Generale Servizi e Appalti	Consultancy and disassembly
<b>Luxembourg</b>	
JMV Aviation	Commercial dismantling and recycling
<b>Netherlands</b>	
Aircraft End-of-Life Solutions	Consultancy, disassembly and parts management
HKS Scrap Metals	Metals reclamation and processing
<b>South Africa</b>	
Universal Recycling	Metals reclamation and processing
<b>Switzerland</b>	
The Green Airliner	Full service salvaging and recycling
<b>United Kingdom</b>	
Air Salvage International	Aircraft salvage, recovery and disposal
GJD Services	Aircraft decommissioning, asset recovery, scrap recycling and hazardous material disposal
Kemble Airport	Air centre
Milled Carbon	Carbon composite recycling
University of Nottingham	
Orange Aero	Engine components
P3 Aviation	Aircraft parts and aircraft dismantling
Robert Gibbs Company	Scrap metal processing
Rolls-Royce Civil Aerospace	Aircraft engine manufacturing
WINGNet/Begbroke	
Oxford University	
<b>USA</b>	
Adherent Technologies	Carbon composite recycling
Aero-Marine Technologies	Aircraft parts distribution and disassembly
AeroTurbine	Aircraft engine and parts sales
Aircraft Recycling Corporation	Aircraft dismantling and metal recovery
Boeing	Aircraft manufacturing
BonusTech	Aircraft engine disassembly
ELG Metals	Alloy reclamation
Evergreen Maintenance Center	Aircraft storage, resale, parts and maintenance
Honeywell Aerospace Trading	Pre-owned Honeywell avionics, APUs, wheels/brakes and mechanical components
Huron Valley Fritz West	Metals reclamation
Magellan Aviation Services	Aircraft aftermarket services
The Memphis Group	Aircraft spare parts
Pratt & Whitney	Aircraft engine manufacture
Source One Aircraft Repair	Recovery, evaluation, repair and modification
Southern California Aviation	Aircraft storage, disassembly and parts
Stewart Industries	Heavy aircraft services
TriRinse	Environmental and demil contractors
Turbo Resources International	Aircraft disassembly and parts
Universal Asset Management	Distressed aviation asset management, aircraft recycling and sales of related inventory
Volvo Aero	Aircraft aftermarket services

were available, but there were also some newer models coming onto the market as a result of the industry's financial problems. Indeed, many of the aircraft parked around the Europe Aviation hangar were on care and maintenance contracts, waiting to return to service with their owners or with leases to new customers.

While the spares business may be profitable, not all of the recycling business is in good shape at present. One holding factor is that the scrap price for aircraft standard aluminium fell substantially in 2008. When a 747 can produce 100 tons of metal and a McDonnell Douglas DC-10 renders up 75 tons, this becomes an important issue. As a result, several aircraft on the site had been stripped but were now in storage until such time as it became economically viable to complete the process. One such example was a 34-year old 747SP.

At the disposal area, the rear fuselage of a 737-200 was lying on the ground as the horizontal stabiliser was removed by a large circular saw attached to the arm of an excavator. This aircraft, built in 1968, had already had the front fuselage removed some time ago. It was shipped to Chichester College in the UK as a cabin crew trainer. On its last legs, before they were removed and shipped to a foundry to be melted down, was a forlorn looking DC-10-30, delivered from the factory in 1974. Scattered around were piles of seats, tyres and undercarriage legs from previous victims of the saw. While there were a few engines, including a set of Pratt & Whitney JT4s from a Boeing 720 that may be refurbished by Europe Aviation for museums, Rickard says many aircraft have their engines removed upon arrival and returned to service.

While it is sad to see aircraft being cut up, a view shared by many people in AFRA it seems, the organisation has proved in a short space of time that it is leading the way in recycling. Carberry stresses that it is an open democracy, with no bar to membership. There is no Airbus versus Boeing attitude in the organisation, he says, acknowledging that Airbus has its own Tarmac project at Tarbes in southwest France, which has a different philosophy to AFRA. However, Airbus may become involved with AFRA members on another project outside AFRA.

To really establish AFRA, the organisation is working towards FAA and EASA approval for its BMP Guide. This would give an international standard for safe, environmentally friendly and profitable disposal of an increasing number of elderly aircraft. ■