Best Industry Practices for Aircraft Decommissioning (BIPAD)

Edition 2

Guidance Material and Best Practices

IATA

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Foreword

The development and production of new aircraft often capture public attention, yet far less is known about what happens when an aircraft reaches the end of its operational life. In recent years, a specialized industry has emerged to manage this phase, delivering impressive results. Today, it is estimated that between 450 and 700 aircraft are decommissioned annually (1) (2).

Despite this growth, many aircraft owners and operators still lack clear guidance on best practices for decommissioning. Properly managing this process is essential to maximizing the residual value of parts and materials while minimizing environmental impact.

To address this need, IATA, in its mission to represent, lead, and serve the airline industry, has developed the Best Industry Practices for Aircraft Decommissioning (BIPAD) Manual. This resource is designed to help airlines and other aircraft owners make informed decisions regarding aircraft decommissioning and the re-use of parts coming off decommissioned aircraft.

Note that regulations are very limited in the area of decommissioning an aircraft. This document is not providing a substitute for regulations but rather provides some best practices to streamline understating and avoid creeping of paperwork requirements and loss of asset value. At the time this document was produced, we were only aware of the CAAC having limited regulations on this matter.

While the first edition was created for aircraft owners/operators to understand decisions around aircraft decommissioning, the second edition focuses on the re-use of aircraft parts coming off during the decommissioning process.

We hope this manual enables stakeholders across the aviation ecosystem to gain valuable insights into the aircraft end-of-life process and contribute to a more sustainable industry by ensuring responsible management of aircraft that have reached the end of their operational life. In addition, it should provide an understanding on the economic decision behind aircraft part-outs when they occur earlier than the end of their operational limits.

Executive Summary

The aim of this manual is to provide guidelines for airlines and other aircraft owners/operators to manage aircraft decommissioning in a controlled process, while considering environmental, safety and economic aspects.

Operational and business conditions and fleet management strategies strongly vary among aircraft owners/operators, and they operate under different regulatory conditions depending on the country of registration. Therefore, no standard procedures can be defined that would be widely applicable to all situations. As a result, the BIPAD manual only provides best practices, process descriptions, general information, and other background information and recommendations. It does not mandate procedures to follow.

The Aircraft Fleet Recycling Association (AFRA) has published its Best Management Practices (BMP) for application by specialized aircraft dismantling and recycling companies. The BIPAD manual primarily addresses a different target group, namely aircraft owners/operators, and is, therefore, complementary to the AFRA BMP.

With a holistic view in mind, the BIPAD manual covers all phases of the aircraft end-of-life process, from the decision to take an aircraft out of service to the final dismantling, recycling and reuse of parts. Accordingly, after Chapter 1 (Introduction to Aircraft Decommissioning), its structure follows the various aircraft end-of-life process phases:

2. Planning for Decommissioning
3. Selection of Facilities
4. Disassembly and Dismantling
5. Overview: Documentation of Parts During Disassembly
6. Documentation and Reporting Details
7. Component Reuse and Recycling

The remaining chapters contain supportive information.

The following paragraphs provide a summary of the relevant content in the BIPAD manual.

Chapter 1 Introduction to Aircraft Decommissioning: Important definitions are listed which are relevant to the decommissioning, disassembling and dismantling process. The market overview contains a broad outline and scenarios reflecting this market, as well as key data influencing its quantitative outlook.

Chapter 2 Planning for Decommissioning: Key factors affecting the decision-making process are explained including the types of valuations as well as the types of appraisals. Also included are practical recommendations for agreements and helpful links to find resources.

Chapter 3 Selection of Facilities: Contains recommendations for the selection of disassemblers, recyclers, and parts traders/distributors, along with helpful links to find these resources.

Chapter 4 Disassembly and Dismantling: This is an illustrated and explanatory overview of the disassembly and dismantling process.

Chapter 5 Overview: Documentation of Parts During Disassembly: Explains the options regarding the declared condition of the parts at the time of disassembly. Also included is information regarding unapproved parts.

Chapter 6 Trace Documentation and Reporting Details: Includes an explanation of trace with a typical illustrated scenario. This chapter also includes important overviews with best practices of key documents which contribute to the trace trail. Note that IATA's Guidance for LLP/TCC traceability documentation provides a detailed framework of the regulatory paperwork needed for these parts during aircraft, engine, and part transitions.

Chapter 7 Component Reuse and Recycling: Summarizes the options for reuse of parts. Recycling scenarios are addressed in Chapter 8.

An interesting subset of the activities referenced in this manual are as follows:

- Operators disassembling a part for use in another assembly. For example, a valve from a spare engine is removed to be fitted to an on-wing engine. For more information, see the cited article (3).
- Owners of a subassembly have it completely or partially disassembled for the parts to be reused. For example, an Auxiliary Power Unit (APU) or Air Cycle Machine (ACM) is disassembled and the parts reused. For more information, see the cited article (4).

Chapter 8 Waste Management and Environmental Compliance: It is important to understand various environmental laws that prescribe the management of several materials and substances involved in the decommissioned aircraft. This chapter includes important issues related to the trace trail of the materials used.

Chapter 9 Innovations and Future Trends: Provides information about ongoing efforts in R&D in the field.

Chapter 1 - Introduction to Aircraft Decommissioning

1.1 Definitions

In order to standardize our understanding of this segment of the aviation industry, the following key words are defined as used in this document:

AA - Aviation Authority; the applicable aviation regulatory government entity for a given nation. For example, but not limited to: ANAC - Agência Nacional de Aviação Civil (Brasil); CAAC - Civil Aviation Administration of China; EASA - European Union Aviation Safety Agency; FAA - Federal Aviation Administration; TC - Transport Canada; etc.

Abandoned aircraft - Refers to the aircraft permanently parked without a storage maintenance program. In some cases, the aircraft has been deregistered, and it may be impossible to identify the owner.

ADM - Aircraft Decommissioning Manual

AFRA Form 0 - A two-part certificate attesting to A) the removal of the aircraft/engine from service with the intent to disassemble, and B) the final demise of the aircraft/engine which has been dismantled/demolished/deconstructed. Also attests to the demise of the dataplate. Loosely, the 'death certificate' of the aircraft/engine.

Aircraft owner - In this manual, this term includes the person or organization that has control over whether an aircraft is to be sold or decommissioned.

ARC - Authorized Release Certificate. The authoritative document representing the condition of the part, for example New, Overhauled, Repaired, Etc. Typical ARCs include, but not limited to: ANAC SEGVOO-003, CAAC AAC-038, EASA Form 1, FAA 8130-3, and TC Form One.

ARM - Aircraft Recovery Manual

As Removed - Commonly used to represent a part's condition (AR) upon disassembly. An AR condition part is not airworthy and must undergo a maintenance, repair, or overhaul (MRO) process before reinstallation on an aircraft.

CAMAC - Civil Aviation Maintenance Association of China. Among the many functions performed by this non-profit organization, is to accredit parts traders/distributors.

Decommission - Refers to the entire process of retiring, disassembling, and dismantling the aircraft.

Disassemble (part out) - After the aircraft has been retired, the action of removing all the valuable parts and components from an aircraft, which are intended to be reused in the aviation industry, see Reuse. Sometimes called the tear-down process.

Dismantle - After disassembling the aircraft, the action of taking out other parts for non-aviation purposes and the destruction of the rest of the aircraft for recycling purposes which is also commonly referred to as demolition or deconstruction.

ESN - The Engine Serial Number of the engine undergoing disassembly.

Green Time - An informal term meaning the amount of cycles or hours left on a Life Limited Part, or an assembly (e.g., an engine). Green time determines the marketability of disassembled LLPs (or the assembly itself).

Harvest List - See Manifest.

ICS - Incident Clearance Statement. Although there are no specific regulatory requirements to produce such document, it is commonly accepted that an Incident/Accident Clearance Statement (ICS), of the aircraft or engine is provided by the last operator of the aircraft or engine. The ICS has been introduced by IATA and AWG to replace the Non Incident/Accident Statement (NIS).

Life Limited Part - a part listed on the aircraft, engine or propeller type certificate data sheet or the manufacturer's instructions for continued airworthiness It must be permanently removed from service and discarded before a specified time (e.g., hours, cycles or calendar limit) is achieved.

Manifest - May be expressed in two instances 1) A list of the desired parts the aircraft (or engine) owner gives to the disassembler. 2) The final audited list of parts the disassembler compiles. Sometime this is called a Harvest List. In addition, the owner may sometimes provide a 'Hot List' of parts it considers to be priority in the disassembly process.

MRO - Maintenance, Repair and Overhaul. A facility certificated by their respective Civil Aviation Authority to perform maintenance as authorized on their certificate. Also known as Approved Maintenance Organization (AMO).

MSN - The Manufacturer's Serial Number of the aircraft undergoing disassembly. Manufacturer's serial number can also apply to end item parts which are serialized.

OAM - Original Aircraft Manufacturer. A commercial term that refers to the Type Certificate Holder (TCH) of the Aircraft.

OEM - Original Equipment Manufacturer. A commercial term that refers to the manufacturer of an aircraft component.

PO - Purchase Order. For purposes of decommissioning, disassembly, and dismantling, means the PO issued by a buyer for the procurement of the subsequent parts.

Recycling - The controlled recovery and reprocessing of materials from retired aircraft and associated equipment in order to return those materials to productive use while minimizing environmental impact and landfill disposal.

Repairable - A Rotable part which is currently unserviceable but is capable of being subjected to an MRO process to restore its serviceability and airworthiness.

Repurposed - Portions of the aircraft which are not being reused for aircraft use, neither will be sent to recyclers, but instead it will be repurposed. For example, a portion of the fuselage is cut and repurposed for flight attendant training.

Retire - The action of the aircraft owner to withdraw the aircraft from active service permanently and worldwide. This does not include the process of disassembling or dismantling the aircraft. (Note When an airline retires an aircraft type, it means that the aircraft will permanently leave the airline's fleet. However, this aircraft may join another airline and continue operations until its permanent retirement from operations worldwide.)

Reuse - Parts/components which have been disassembled from the aircraft and are intended to be returned to active use. Sometime called reclaimed parts.

Rotable - An item that can be economically restored to a serviceable condition and, in the normal course of operations, can be repeatedly rehabilitated to a fully serviceable condition.

Serviceable - In respect of an aircraft, engine, or aircraft part, means the aircraft or part is in a fit and safe state for flight.

Stored aircraft - Refers to the aircraft temporarily parked under a storage maintenance program. The aircraft could return to active service or be decommissioned afterwards.

SUP - Suspected Unapproved Part. A part, component, material, or appliance for which there is reason to believe that it does not conform to applicable approved design data, production requirements, or maintenance certification standards, or for which the traceability, documentation, or origin cannot be satisfactorily established.

Tags/Tagging - Depending on the context of its use, is an informal legacy term meaning either a literal tag affixed to the part and/or an Authorized Release Certificate, see ARC.

Trace - 1) Primarily means documentation which represents a chain of custody for the part in hand being reused, to its Next Higher Assembly it was disassembled from. 2) Alternatively, it describes the chain of custody for material which is not being reused or repurposed and is being dedicated to the recycling process. This trace is meant to assure that, for example, the material is not being unknowingly subject to 'environmental dumping'. As noted earlier, for Traceability re: Life Limited Parts (LLP) and Time Controlled Components (TCC), please see the reference (5). Also, note that this document is currently under revision and will be published by the end of 2026.

UPN - Unapproved Parts Notice. When Aviation Authorities investigate and determine that unapproved parts exist and the aviation community should be notified of the details, an Unapproved Parts Notification (UPN) is issued. Other titles of such notifications may be issued such as Safety Alerts or Safety Notices among others.

USM - Used Serviceable Material. Rotable, serviceable parts which are in other than New condition. E.g., Overhauled, Repaired, Inspected, Modified, or Tested parts.

1.2 Market Overview

(a) Generally, the market to decommission, disassemble, and dismantle has arisen to apply to two types of assets: aircraft (minus the engines) and engines. This segmentation has arisen because the requirement in expertise and tooling between the two are distinctive, and because of the variations in ownership vs. leasing.

(b) It's important to recognize the many noted variations among airlines/operators, and lessors/owners to which the contents of this publication could apply and therefore see some variation in the suggested processes. Primarily this could affect the scope of contracts/agreements to perform disassembly and dismantling. For example:

- Airline/Operator:

(i) The entire aircraft is owned including the engines.

(ii) The aircraft is owned but the engines are leased.

(iii) The aircraft and engines are leased.

- Leasing companies:

(i) The company only leases aircraft (minus engines).

(ii) The company only leases engines.

(iii) The company leases both engines and aircraft

(iv) A given aircraft in their portfolio could have its engines under lease by a competing leasing company and vice versa.

- An MRO, disassembler, or distributor has purchased the asset:

(i) The entire aircraft is owned including the engines.

(ii) The aircraft is owned but the engines are leased.

(iii) The engine is owned

These distinctions are made regarding scope. For example, the aircraft owner may have made the decision to decommission, disassemble, and dismantle an aircraft, but the engines are leased. It would be common then, that upon commencement of the disassembly, the leasing company makes separate arrangements to remove and ship their own engines for redelivery.

(c) Another evolved distinction in the disassembly and dismantling market is that of onsite or remote operations. Onsite being the operations occur at the address of record for the disassembler, whereas for remote work the operations occur at a remote location. Remote operations may be necessitated due to the aircraft not being airworthy for flight for reasons including:

- Required maintenance has not been performed.
- War damage.
- Abandonment.
- An accident or incident.
- Grounded due to bankruptcy proceedings.
- Natural disasters/Weather damage

(d) Direct, key indicators of likely decommissioning, disassembly, and dismantling activity are reflected in the number of aircraft retirements taking place.

(e) As illustrated in Figure 1 through Figure 5, retirement activity is dynamic and sensitive to market conditions.

(f) Reported data for retirements is not real time; it lags, with two-year old data being the most accurate.

(g) Generally, and overall, aspects contributing to the retirement decision making process include but are not limited to:

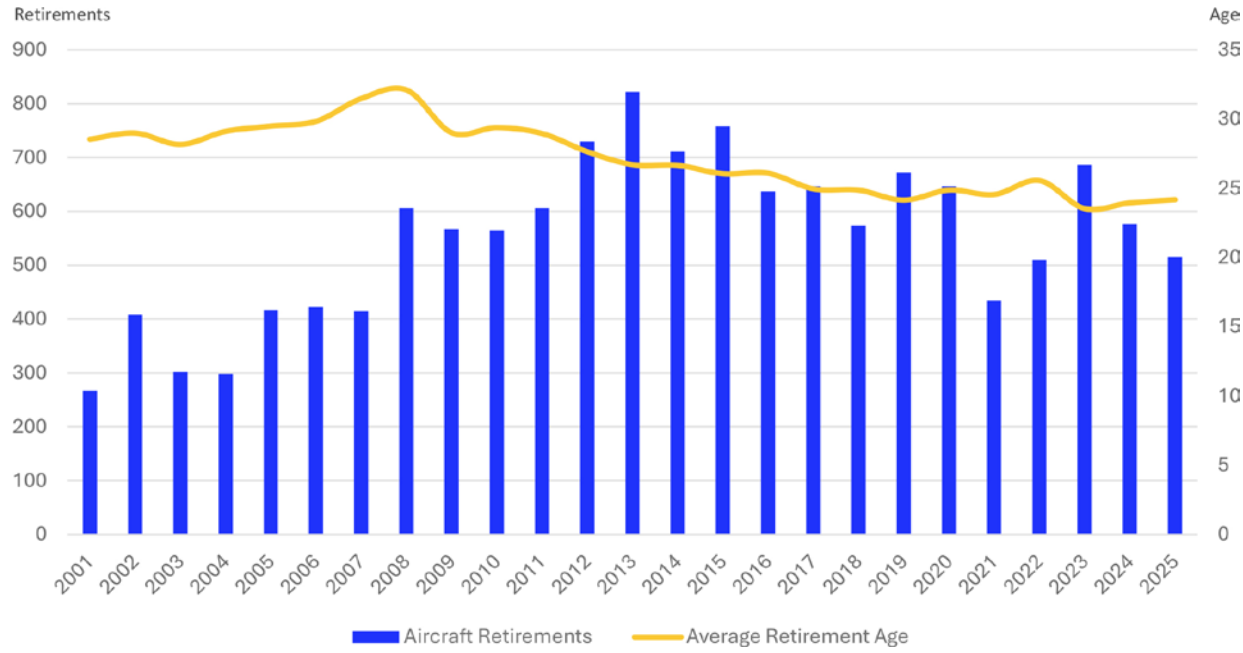
- The cost of fuel.
- Regulatory Noise restrictions.
- The availability or lack thereof of new aircraft.
- The availability or lack thereof of the parts supply chain.
- Economic efficiencies (lower operating costs) of newer aircraft.
- The cost of capital.
- The possible onset or confluence of high cost scheduled maintenance.
- Continuing growth in demand for passenger and cargo operations. Record levels of global fleet utilization are at its peak.

1.2.1 Factors Affecting Retirement Data

1.2.1.1 Detailed Aircraft Retirements 2001-2025

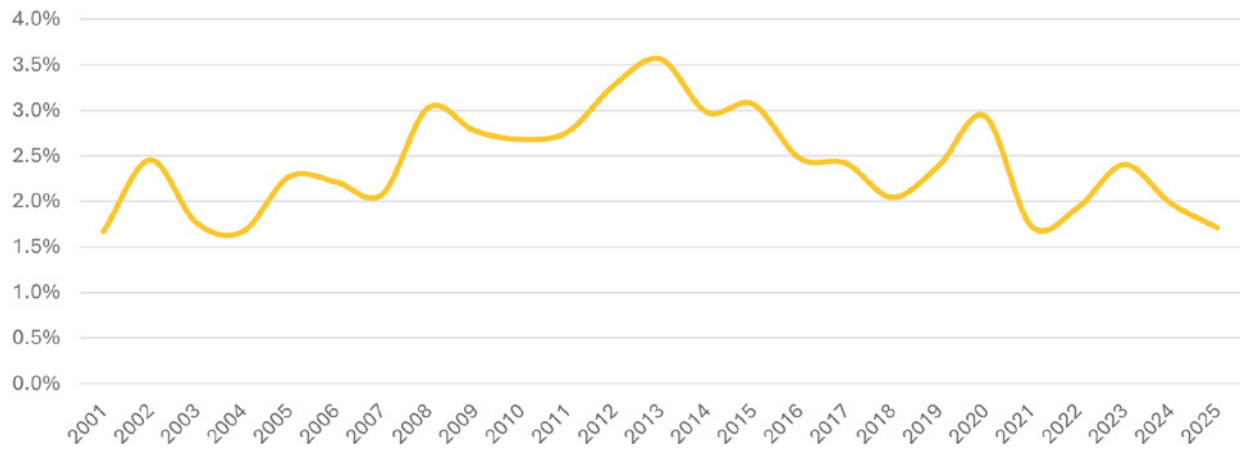
The number of parked aircraft just before COVID and Q4 2024 has increased by over 50% (more than 1700 aircraft) (6). Many aircraft owners are delaying their decision to retire an aircraft. The Commercial Aviation Supply Chain has been faced with significant delays in aircraft deliveries and parts needed in aircraft maintenance, resulting in less retirements since 2024 (7).

Figure 1
Aircraft Retirements per Year 2001-2025



Historically, aircraft retirements have represented between 1.7% and 3.5% of the active fleet, averaging roughly 2.2% over the past decade. More recently, however, retirement rates have been relatively subdued.

Figure 2
Aircraft Retirements as % of Active Fleet per Year 2001-2025



DISCLAIMER

Variations between aircraft and fleet data in industry reports are attributed to several factors that need to be recognized in advance of any reporting:

1. Differences between the databases and the methods used to collect aircraft and fleet information. The timing of data reporting in a database may also be different (leading in time lagging of reported information).
2. Categorization of certain fleets and aircraft types that depend on how an operator, lessor, etc. denotes the fleet.

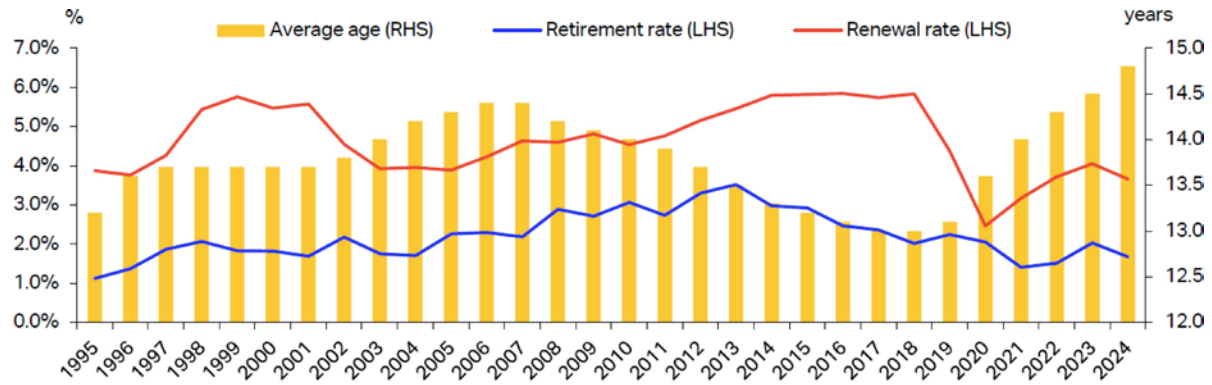
3. Inclusion/exclusion of certain aircraft types in the world fleet (e.g., min passenger capacity (applies mostly to turboprops and regional jets), Soviet/Russian built aircraft, out-of-production fleets, regional jets vs. single aisle etc.).
4. The terminology used between different databases differs. It is related to different definitions between manufacturers, operators, and even individuals reporting the same information. An example is the variation between terms such as parked, preserved, stored, in-service, retired etc. for an aircraft.

1.2.1.2 Fleet Renewal on Hold: Aging Aircraft Stay in Service (8)

The current rate of aircraft retirements remains near record lows. In normal market conditions, older and less efficient aircraft would be phased out steadily as new deliveries arrive, and operators would optimize their fleets for cost and sustainability. However, with manufacturers unable to meet delivery targets and lead times for new aircraft, which have extended well beyond pre-covid norms, airlines have been forced to retain aging equipment longer than planned. The scarcity of replacements has effectively suppressed the natural retirement cycle, resulting in the highest average fleet age in the history of aviation and delaying the transition to more fuel-efficient models.

Due to a parts shortage, the industry has seen a number of new aircraft being decommissioned and parted-out in order to support the world's operating fleet with parts. In such cases, the decision to decommission the aircraft is solely driven by economic factors. In February 2026, two A320neos (aged 4 and 3.5 years) have been acquired by an asset management company and will be torn down for parts (9).

Figure 3
Average age of global fleet, fleet retirement rate, and renewal rate*

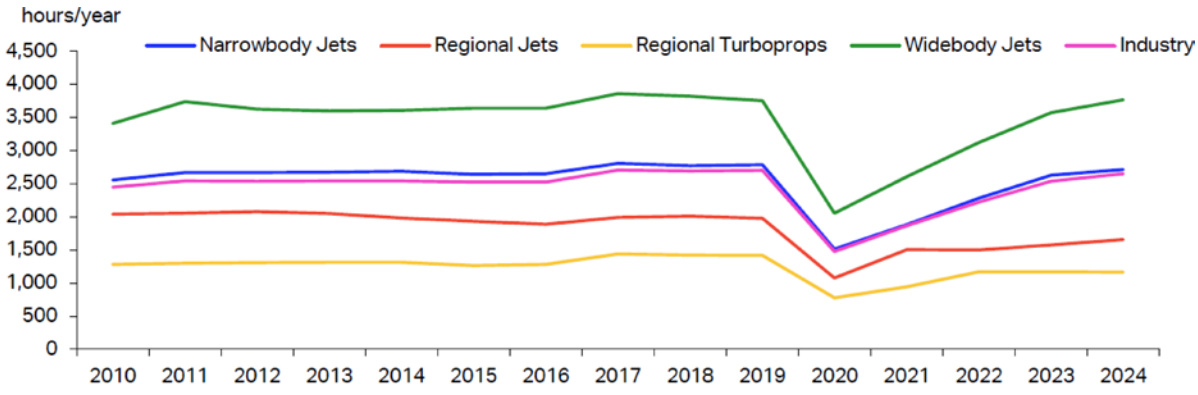


Source: IATA Sustainability and Economics, Cirium Fleets Analyzer * retirement rate = retirement events/fleet in service and storage at the beginning of period; renewal rate = delivery events/fleet in service and storage at the beginning of period

1.2.1.3 Global Fleet Utilization is at Its Peak (8)

Fleet utilization across the global commercial aircraft fleet has reached record levels in 2024. This surge reflects the intense operational pressure on airlines to maximize output from existing fleets amid persistent aircraft delivery delays and constrained capacity growth. However, not all segments have recovered equally. Utilization of regional jets and turboprops remains well below historical levels, as pilot shortages and cost pressures have led many airlines to consolidate frequencies and upsize to larger aircraft. This shift has reduced the operational role of smaller aircraft types, despite their continued relevance in certain markets, and shows the uneven nature of the recovery across fleet segments.

Figure 4
Utilization of global commercial fleet by market class, hours per year



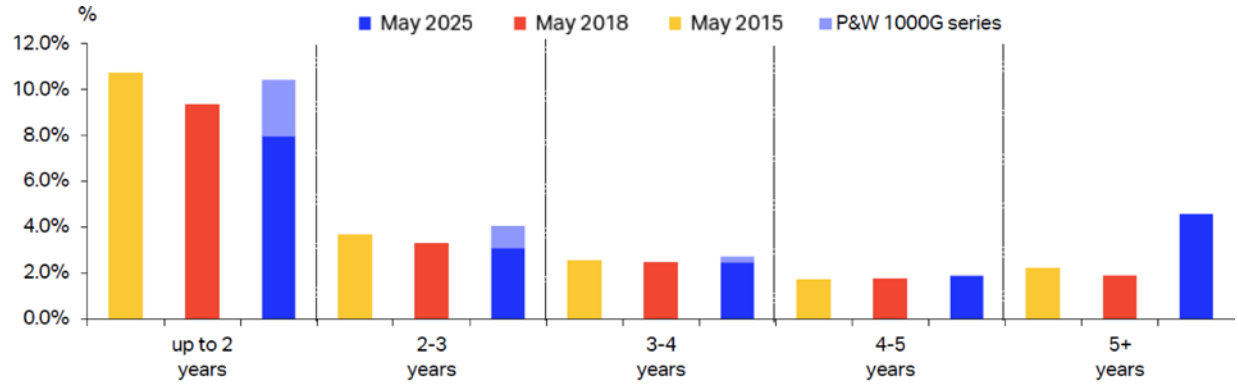
Source: IATA Sustainability and Economics, Cirium Fleets Analyzer

1.2.1.4 Older Aircraft Remain in the Fleet Instead of Being Retired (8)

The persistence of older aircraft in storage rather than in full retirement reflects another effect of aircraft shortage, that convinced airlines to retain aging aircraft as a hedge against delivery uncertainty. Simultaneously, the secondary market for mid-life aircraft has tightened, driven by a lack of new aircraft. This has elevated the residual value of certain types of stored aircraft, making outright retirement less attractive.

While the overall percentage of the global fleet currently in storage appears elevated, likely reflecting ongoing engine-related issues, particularly with the PW1000G series, the more structurally significant trend lies in the fleet parked for the long term. The share of aircraft parked for over five years has reached an unprecedented level, surpassing historical benchmarks. Such prolonged storage may indicate deeper shifts in fleet economics, including diminished resale viability, deferred retirement decisions, or strategic asset holding in anticipation of future cargo conversion or regulatory clarity. In contrast, the short-term storage segment reflects a very different dynamic, virtually everything that can fly is flying.

Figure 5
Global parked fleet by duration of in storage status, as % of total fleet



Source: IATA Sustainability and Economics, Cirium Fleets Analyzer

Chapter 2 - Planning for Decommissioning

2.1 Aircraft and Engine Valuation

Typically, there are three scenarios when planning for decommissioning:

- The airline or lessor will sell outright the aircraft or engine that is being decommissioned, usually through a bidding process.
- The airline or lessor will retain ownership of the aircraft or engine and its subsequent parts throughout the process of decommissioning and disassembly.
- If the market for the disassembled parts appears weak, another option is to enter into a consignment agreement regarding the sale of the parts, between the airline/lessor and a disassembler and/or distributor. In some of these cases, the whole process may take a long time as different parts are harvested as needed.

In these cases, the proper valuation of the aircraft or engine and subsequent parts is critical in determining the profitability of the proposed decommissioning project. For this purpose, there are two topics to consider: the type of valuation and the type of the actual appraisal.

Recent EU regulation (European Commission's EU Taxonomy Regulation) may influence financial decisions related to aircraft retirement by classifying certain activities as environmentally sustainable and thereby improving access to green financing. While the framework does not provide direct incentives for scraping aircraft, the permanent withdrawal of older, less efficient assets can support taxonomy-aligned investments such as fleet renewal, emissions reduction, and circular economy practices including material recovery and parts reuse. As a result, airlines and lessors may consider accelerated retirement or structured decommissioning strategies where these actions contribute to sustainability reporting, ESG objectives, or favorable financing terms. Consequently, aircraft end-of-life decisions may increasingly reflect not only technical and economic drivers but also environmental classification and capital market considerations. The Aviation Working Group (AWG)-IATA Manual for best practices under the EU Taxonomy provides some guidance on this topic.

(a) According to ISTAT's Appraisers Program Handbook (10), here are some selected types of valuations:

- **Base Value** is the Appraiser's opinion of the value of an aircraft (or other aviation-related asset) in a stable market with a reasonable balance of supply and demand. The Base Value of a tangible asset typically assumes its physical condition is average for an asset of its type and age, and its maintenance status is as described.
- **Market Value or Fair Market Value** (or Current Market Value or Current Fair Market Value, if the value pertains to the time of the analysis) is the Appraiser's opinion of the most likely trading price that may be generated for an aircraft (or other aviation-related asset) under the market circumstances perceived to exist at the time in question.
- **Distressed Transaction Value** is the Appraiser's opinion of the price at which an aircraft (or other aviation-related asset) could be sold when the seller is under duress to sell (e.g., an artificially limited marketing time period), a liquidation, commercial restrictions, legal complications, or other such factors that materially reduce the bargaining leverage of the seller and give prospective buyers a significant advantage that can translate into an actual trading price materially below Market Value. Apart from the preceding, Distressed Transaction Value assumes that the value is for a single-unit transaction valued for the asset's highest and best use (as defined by the Appraiser), that the parties to the potential sale would be able, prudent and

knowledgeable, and negotiating (or bidding, in the case of auction) at arm's-length, for cash or equivalent consideration, under the market conditions that are perceived to exist at the time.

- **Part-Out Value** is the Appraiser's opinion of value of an aircraft (or other tangible aviation-related asset) when its highest and best use (as defined by the Appraiser) derives from airframe, engines, other major assemblies and/or parts having a higher market value than it does as an operating entity. Comment: Based on ever-evolving age, technology, major maintenance costs, configuration, operating capability, efficiency, competitiveness with newer models and other factors, there comes an inflection point when, in the opinion of the Appraiser, the highest and best use (as defined by the Appraiser) of an aircraft (or other tangible aviation-related asset) is to be disassembled for parts. Part-Out Value is a wholesale value based on the potential market value to a specialist aircraft disassembly company of individual parts and assemblies, including engines, landing gear, APUs, rotable parts, airframe parts, etc.
- **Disassembly Value** reflects the anticipated revenue from the retail sale of individual parts and assemblies, net of the cost of disassembly, repair, testing, refurbishment, handling, storage, inventorying, marketing and sales, etc.
- **Scrap Value** is the actual or estimated market value of an aircraft, engine or major assembly based solely on its metal or other recyclable material content with no saleable reusable parts or components remaining. The scrap value is usually expressed as net of removal and disposal costs. In some cases, scrap value could be zero if the dismantling and disposal costs are high, as for example hazardous materials or composite assemblies that might be impossible to recycle. A negative scrap value may occur when the total cost of dismantling, handling, environmental compliance, and disposal exceeds the recoverable value of recycled materials and residual assets.

(b) The types of Appraisals include the following (10):

1. A **Desktop Appraisal** is one which does not include any inspection of the aircraft or review of its maintenance records. It is based upon assumed aircraft condition and maintenance status or information provided to the Appraiser or from the Appraiser's own database. A Desktop Appraisal would normally provide a value for a mid-time. mid-life aircraft.
2. An **Extended Desktop Appraisal** is one which is still characterized by the absence of any on-site inspection of the aircraft or its maintenance records but does include consideration of maintenance status information that is provided to the Appraiser from the client, aircraft operator, or in the case of a second opinion, possibly from another Appraiser's report. An Extended Desktop Appraisal would normally provide a value that includes adjustments from the mid-time, mid-life baseline to account for the actual maintenance status of the aircraft.
3. A **Full Appraisal** is one that includes an inspection of the aircraft and its maintenance records. This inspection is aimed solely at determining the overall condition of the aircraft and records to support the value opinions of the Appraiser, and would not, for example, include opening of inspection panels on the aircraft or a detailed review of record archives. A Full Appraisal would normally provide a value that includes adjustments from the mid-time, mid-life baseline to account for the actual maintenance status of the aircraft, and possibly other adjustments to reflect the findings of the inspection of the aircraft and its records.
4. A **Comprehensive Appraisal** is one that includes a detailed inspection of the aircraft and records. Sufficient detail is required, for example, to ensure that the records are in sufficiently good order to allow for the re-registration of the aircraft in a different country.
5. A **Financial Appraisal** is one that determines the value of an aircraft based upon the income earning potential from its lease and residual value. A Financial Appraisal may be conducted in conjunction with other appraisal types.

(c) A common practice is that the value of the aircraft or engine is based on the collective resale value of the harvested parts. This depends on having an accurate listing of the installed parts to base the valuation. Typical sources for these parts are the operator's:

1. LLP Lists- Life Limited Parts records.
2. OCCM List- On Condition/Condition Monitored components.

For prospective buyers of an aircraft or engine, the perceived accuracy of these records figures prominently in their buying decision.

2.1.1 Finding Appraisers

Frequently used listings of appraisers can be found at these two websites:

- ISTAT, International Society of Transport Aircraft Trading, www.istat.org
- American Society of Appraisers, ASA, www.appraisers.org

2.1.2 Finding Buyers

For airlines and lessors whose decommissioning plan includes selling the aircraft or engines, the most frequent buyers for this purpose are disassemblers and distributors. The following links contain recommended listings for consideration to send bid notices to:

- Disassemblers: AFRA, Aircraft Fleet Recycling Association, its accredited listings, www.afraassociation.org
- Distributors: ASA, Aviation Suppliers Association, its database of ASA-100 and FAA AC-00-56 accredited distributors, www.aviationsuppliers.org
- The IATA MRO SmartHub is currently a platform that allows aircraft and parts owners to seek interested parties when they plan to dismantle an aircraft. It also allows parties to jointly bid for different parts of the aircraft in the decommissioning process.

2.1.3 Finding Sellers

For distributors and disassemblers seeking aircraft or engines for the purpose of disassembly, for transport category sized aircraft, there does not at this time appear to be customary methods or websites for this purpose. Instead, distributors and disassemblers should establish relationships with the airlines and lessors to make known their desire to bid when the opportunity arises. IATA MRO SmartHub offers a feature that allows this function.

2.2 Drafting an Agreement with a Disassembler

For airlines or lessors who retain ownership of the aircraft or engine and who will enlist the services of a firm to perform the disassembly, dismantling, and recycling process, it is important that the full scope of the project be carefully detailed.

1. The following is a list of questions which should be discussed for possible inclusion in any contract or agreement (11):
    - What is the asset and what is the scope of work? What exactly does the airline expect?
    - Who identifies the need for, and obtains the licenses, associated with the work scope? Which set of laws applies to the disassembly?
    - Where does the disassembly take place?
    - Who is responsible for access to the site where the aircraft is located and who has access?

- What is the location for disassembly? Who is responsible for moving the aircraft to the place where it will be disassembled? Who is responsible for the associated costs?
- Who owns the parts? Who owns the fuselage or other remainders once disassembly is complete? Does the disassembler have any right to salvage of the remainder? Who is responsible for disposing of remainder?
- Payment for services? Who is responsible for taxes? What are the terms of payment? What if the customer believes that the work has not been completed - what remedies and procedures apply?
- Who is responsible for delays or failures to perform due to acts of God or other events?
- Does either side indemnify the other for certain types of liabilities?
- Who is responsible for identifying the need for, obtaining, and paying for insurance?
- Owner should warrant that he has the legal authority to give permission for the disassembly.
- What parts are to be removed? What is the status of these parts upon removal (e.g. AR, OH)? What is the procedure for amending that list?
- What is the schedule for disassembly? What deadlines apply? Are there penalties for late completion or bonuses for early completion?
- How will contract disputes be resolved? Is there a set process? What law applies to the resolution of disputes? Where must disputes be resolved?
- Who is responsible for health and safety risk and compliance issues?
- Who is responsible for protection and security of asset/location and how will this be accomplished.
- Who is responsible for insurance?
- Can either party assign its rights or obligations under the agreement? Are there conditions for assignment of rights or obligations?
- Liability for removal damage - identification of removal damage v. pre- removal damage?
- Who will supply facilities for disassembly? Tooling for disassembly? Stands, jacks, drop kits, etc. Special tooling? Manuals, instructions and other data?
- Who will supply documentation on the aircraft to support traceability?
- Who is responsible for logistics, transportation and other responsibilities, including export control and customs constraints?
- What is the effect of various forms of taxation (property tax, sales tax, environmental charges, disposal fees, customs, tariffs, etc.) on the transactions?

2. Significant among all these contracts, and as noted above, is the listing of desired parts to be removed. This is provided by the airline or lessor to the disassembler. The list should be referred to in the contract and treated as a separately maintained appendix or addendum. This list can have any name but the most frequent are:
   - Harvest List.
   - Manifest List.
   - 'Hot List'. An optional list of parts the airline or lessor identifies as having the greatest need or value and to which priority should be given in the disassembly process.

     Typical sources for these lists are the operator's:
   - LLP Lists- Life Limited Parts records.
   - OCCM List- On Condition/Condition Monitored components.

3. Equally significant for careful addressing in the contract is that the disassembler will provide a final 'audited' list of all the removed parts, typically the Manifest. 'Audited' in this sense means that the final list has been carefully inspected and cross checked against the actual removed parts for part number and serial number accuracy. This is important for two reasons:
    - It is recognized that the list of parts provided by the airline or lessor are not always accurate regarding the actual installed part numbers or serial numbers, and it is the responsibility of the disassembler with the eyes and hands on the parts to accurately note any differences.
    - It is this list which the owner of the parts will use for subsequent dispositioning of the inventory (see Chapter 7: regarding Reuse Options).
4. It is a best practice to include in the agreement or contract that the disassembler will be required to take multiple profile pictures of the removed parts indexed to the removal/identification tag. These pictures assist greatly in marketing the parts and in protecting the shipper in case the recipient claims the parts were shipped damaged.

Chapter 3 - Selection of Facilities

An overall summary of relevant accreditations which may apply to aspects of the decommissioning process, and which may contribute as determinants for selection and qualification of the applicable supplier are shown in the following table:

Table 1
Accreditations per Business Sector

Business Sector	AFRA	CAAC 145 Certificated Disassembler	ISO 9001	AS9100	AS9110	AS9120	ASA-100	CAMAC	IATA ISP / IEnvA	ISO 14001	EMAS
Disassembler	A	A	Q						E	E	E
Dismantling	A		Q						E	E	E
Recycler	A		Q						E	E	E
MRO			Q		Q				E	E	E
Parts Trader / Distributor			Q			Q	Q	Q		E	
OEM			Q	Q					E	E	E

A = Applies to the sector
Q = Quality Management System (QMS)
E = Environmental Management System (EMS)

3.1 Selection of Disassemblers

1. Minimally it is recommended that a disassembler be selected who is accredited to perform this function. AFRA, Aircraft Fleet Recycling Association, has a program whereby facilities which implement a Quality System based on the Disassembly Best Management Practices, BMP, and those who successfully pass onsite Quality Audits are listed on a publicly available database at this website under the accreditation menu:
   - www.afraassociation.org
2. Another choice is that the Civil Aviation Administration of China, CAAC, certificates qualified CCAR (China Civil Aviation Regulation) Part 145 MRO facilities to perform aircraft disassembly as authorised on their 145 (12). These are limited by aircraft type as noted on the certificate's 'Limitation of Maintenance Items' (equated with 145 Operations Specifications), a redacted sample of which is located in the Appendixes. The CAAC has a searchable website for their approved maintenance organizations, but there does not appear at this time to be direct method to search for dismantlers without downloading the certificate of the firm. Here is the link, and use your browser's translate function as needed:
   - https://fsop.caac.gov.cn/g145/CARS/WebSiteQueryServlet
3. Location: Under normal circumstances the primary criteria for selection of a disassembler includes price, availability, and capability, and it is understood that the aircraft will be flown to the location of the selected facility if not already there. There arise occasions, however, as introduced in Chapter 1, that the aircraft is not capable of flight which may include the following reasons:
   - Required maintenance has not been performed.
   - War damage.
   - Abandonment.
   - An accident or incident.

- Grounded due to bankruptcy proceedings.
- Natural disasters/Weather damage

Under such circumstances some disassemblers have the capability to perform disassembly and dismantling operations remotely, that is, away from their location of record. Contact them to ask about this capability.

3.2 Selection of Recyclers

For airlines, operators, or owners seeking to connect to firms with a documented and accredited environmental compliance program, the following standards should be considered:

- IATA Integrated Sustainability Program (13): The Integrated Sustainability Program (ISP) provides Standards & Guidance for developing ESG Management System, designed specifically for aviation. ISP's modular structure allows organizations and their teams to choose the programs and certifications best suited to their current operational needs and sustainability ambitions. This flexibility ensures that sustainability practices are adopted, integrated, and executed effectively, both in the short term and as part of a long-term strategy. ISP was specifically designed to meet the needs of aviation organizations. It was developed in collaboration with aviation leaders, aligned with ISO and other global standards, and built around the industry's most significant risks and opportunities. The program builds upon and rolls up IATA's Environmental Assessment (IEnvA) accreditation program into this new ISP standard. The ISP is relatively new but, in the meantime, the existing certifications for IEnvA will suit this purpose.
  - Finding firms with IATA IEnvA certifications is available at: https://onesource.iata.org/s/
- ISO 14001: ISO 14001 is the internationally recognized standard for environmental management systems (EMS). It provides a framework for organizations to design and implement an EMS and continually improve their environmental performance. By adhering to this standard, organizations can ensure they are taking proactive measures to minimize their environmental footprint, comply with relevant legal requirements, and achieve their environmental objectives. The framework encompasses various aspects, from resource usage and waste management to monitoring environmental performance and involving stakeholders in environmental commitments (14).
  - Verification of firms stating they are 14001 can be researched at https://www.iafcertsearch.org/
- AFRA Aircraft Fleet Recycling Association: The AFRA Best Management Practice for Management of Used Aircraft Parts and Assemblies and for Recycling of Aircraft Materials (BMP) provides a comprehensive framework of best practices for managing used aircraft parts and assemblies, as well as recycling aircraft materials at the end of their service life. These guidelines support environmentally responsible and efficient disassembly and recycling processes, ensuring compliance with industry-leading sustainability standards (15).
  - Finding AFRA accredited firms is available in this directory: https://afraassociation.org/accredited-companies
- EMAS: Eco-Management and Audit Scheme. It is a voluntary environmental management instrument designed by the European Commission for helping organisations enhance their environmental performance, save energy, and optimise resource usage. It is a premium management instrument to evaluate, report, and improve organisations' environmental performance (16).
  - Finding EMAS published organisations is available at this register: https://webgate.ec.europa.eu/emas2/public/registration/list
- Beyond certifications, it is important to ensure that recyclers hold appropriate local waste management authorizations.

3.3 Selection of Parts Traders/Distributors

Airlines, Lessors, or any owner of aircraft or engines may choose to partner with parts traders/distributors for the following purposes:

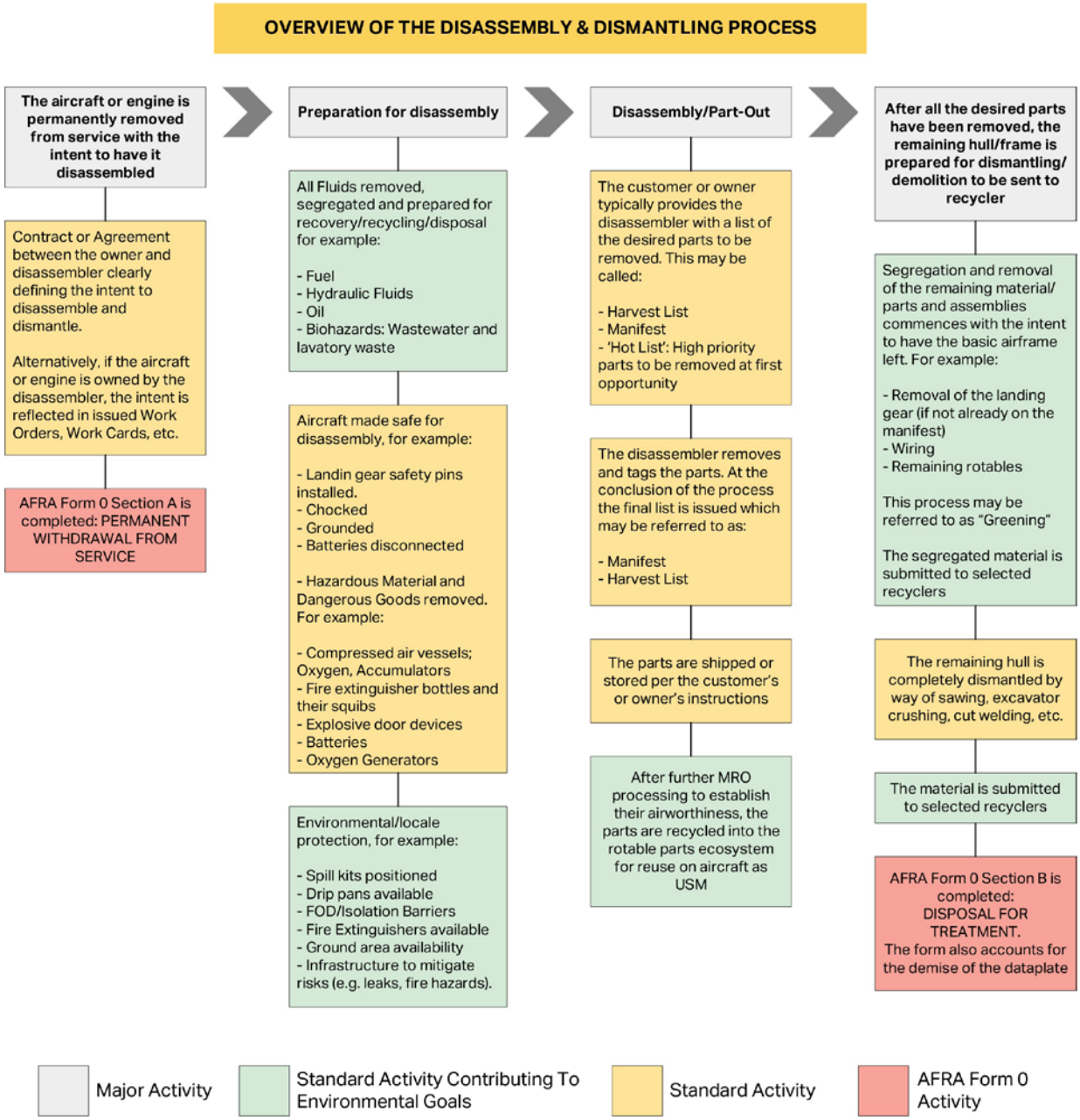
- Warehousing the inventory of disassembled parts; acting as a 3PL (17).
- Act as a partner for the purpose of a consignment agreement.
- Wanting to sell outright your inventory to a reputable firm.

As shown in Table 1, parts traders/distributors have several options regarding accreditations which are amplified as follows:

- ASA-100: On September 5, 1996, the FAA published Advisory Circular (AC) 00-56, titled, "Voluntary Industry Distributor Accreditation Program." The purpose of this Advisory Circular was to describe an accreditation system for civil aircraft parts distributors on the basis of voluntary industry oversight and provide information useful for developing an accreditation program. As a strong proponent of the voluntary accreditation program, the Aviation Suppliers Association assisted the FAA in writing AC 00-56, and, as a result, developed its own quality system standard, ASA-100. The ASA-100 Quality System Standard has since become the leading quality system standard under FAA AC-0056 (18).
  - A list of ASA-100 accredited firms is at this link: https://www.aviationsuppliers.org/ASA-100-Companies
  - The FAA has delegated to the ASA the maintenance and posting of firms accredited in accordance with FAA AC 0056. This database may also serve as a means to evaluate and contribute as determinants for selection and qualification of parts traders/distributors at this link: https://www.aviationsuppliers.org/FAA-AC-00-56B
- CAMAC: The Civil Aviation Maintenance Association of China is authorized (19) (20) by the Civil Aviation Administration of China to perform various functions supporting accreditation of parts traders and upon successful completion be issued a CAMAC 'Certificate of Aircraft Parts Distributor'.
  - Although in Chinese, your web browser may have the capability to translate its contents. Here are the CAMAC website links:
    - http://www.dasp-camac.org.cn/index.php, or
    - http://www.dasp-camac.org.cn/#
    - A copy of their certificate can also be obtained at this site.
- AS/EN/IA 9120. AS9120 is an international quality management system standard for distributors of aerospace, space, and defense parts. It's based on the general AS9100 standard but includes specific requirements for stockist or pass-through distributors, focusing on the control of records, chain of custody, and traceability of parts from receipt to delivery.
  - The AS9120 Oasis database is a product of the International Aerospace Quality Group (IAQG) for the Online Aerospace Supplier Information System (OASIS), which is a mandatory registry for all companies certified to the AS9100, AS9110, and AS9120 standards.
    - The IAQG website is the entry point for accessing the OASIS database.
    - You will need to create an account to access the full functionality of the database. https://oasis.iaqg.org/Login.aspx
    - If you only need to verify a certificate, go to this website: https://www.iafcertsearch.org/

Chapter 4 - Disassembly and Dismantling

Figure 6
Overview of the Disassembly and Dismantling Process



As illustrated in Figure 6, the disassembly and dismantling process generally involves four key procedures:

- The aircraft or engine is permanently removed from service with the intent to have it disassembled.
- Preparation for disassembly.

- Disassembly/Part-Out.
- After all the desired parts have been removed, the remaining hull/frame that is prepared for dismantling/demolition/deconstruction should be sent to recyclers, and avoid, as much as possible, to be sent to landfills.

4.1 The Aircraft or Engine is Permanently Removed from Service with the Intent to have it Disassembled

In this stage owners document their intent to have the aircraft or engine removed from service and have it disassembled and dismantled. This intent is typically documented as follows:

- The owners, which could be an airline, lessor, or distributor, enter into a contract or agreement to the have the aircraft disassembled and dismantled.
- If the owner is now the disassembler, the intent is documented through the issuance of Job Cards or Work Cards, or the equivalent.
- At this stage it is a best practice that the disassembler issues and completes AFRA Form 0, Part A. Permanent Withdraw from Service.

4.2 Preparation for Disassembly

Here the disassembler prepares the aircraft for disassembly which can be generally described and divided into the following tasks:

- Environmentally connected tasks. For example, draining all fluids for recycling or disposal, and positioning of environmental protective equipment as spill kits, fluid containers, overflow/spill pallets etc.
- Making the aircraft safe for disassembly including for example, grounding, drainage of biohazard fluids, positioning of fire extinguishers, removal of hazardous materials and dangerous goods, positioning of counterweights, etc.
- The Appendix contains a listing of examples of dangerous goods and hazardous materials to be removed and treated properly from aircraft.

4.3 Disassembly/Part-Out

At this point the task of disassembly takes place. This is sometimes called the part-out or tear-down process and simply equates to the parts being removed from the aircraft or engine. Key topics include:

- If the owner has provided a 'Hot List' or equivalent, these parts are removed first.
- Other than the Hot List, the customer provided list of desired parts are then removed.
- Each part is given the all-important removal or identification tag; see Chapter 6.
- Upon completion the disassembler provides a manifest of the removed parts; see Chapter 6.

4.4 Preparation for Dismantling/Demolition to Be Sent to Recycler

At this stage the desired parts have already been removed, and the remaining aircraft will be processed for dismantling (sometimes called demolition or deconstruction) and recycling-see Chapter 7. Best and common practices include the following:

- A best practice is that prior to the actual dismantling, remaining parts and materials are removed and segregated for possible specialty recycling purposes. Examples include but are not limited to removal of all the wiring for recycling of the copper or landing gear for specialty metals, and remaining cabin. Some may refer to this as the 'greening' process.

- The remaining aircraft is then dismantled by methods which could include sawing, cut welding, and/or excavator crushing. Note that some sections of the fuselage could be repurposed as detailed in Chapter 7.
- At the conclusion of this process, it is a best practice that the disassembler completes the AFRA Form 0, End of Life certification.

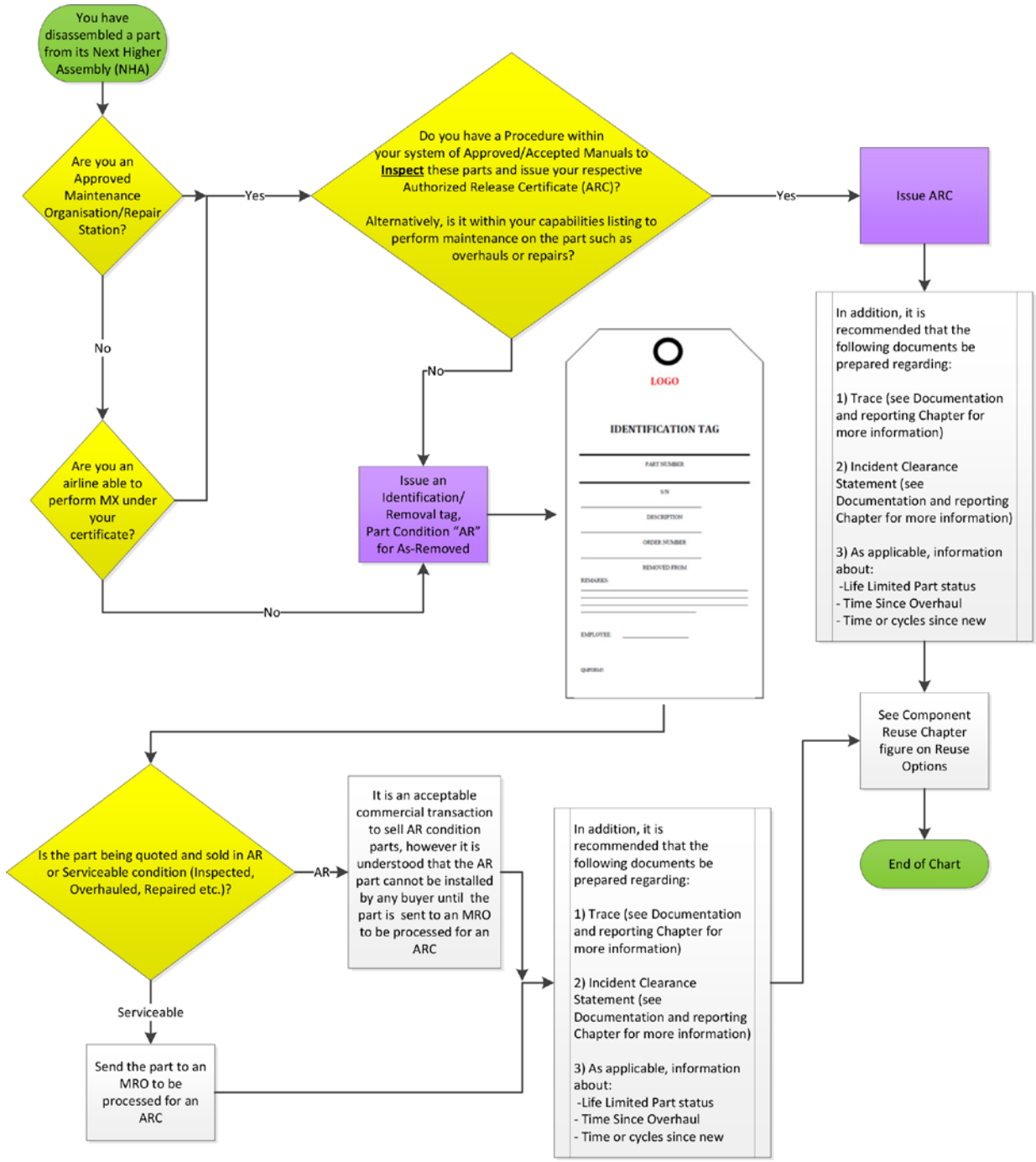
Note: *It is essential to clearly distinguish between two types of disassembly activities:*

(a) Activities that are performed under Part 145 (Approved Maintenance Organization - AMO, also known as MRO) conditions allow for the direct issuance of an Authorized Release Certificate (ARC) for the removed components. The ability to inspect parts and issue an ARC under the proper aircraft rating (Part 145) requires full compliance with maintenance procedures and approved manuals. Removal of parts under Part 145 certified conditions significantly simplifies the reuse of parts (reduces costs and future requirements).

(b) Activities limited to standard removal (AR) of parts, require subsequent processing by an approved component shop that will issue the ARC according to the appropriate maintenance/repair manual and defined processes as required. The capability to perform maintenance, such as overhaul or repair, on the AR parts depends on the component rating of the shop.

Chapter 5 - Overview: Documentation of Parts During Disassembly

Figure 7
Flowchart of Disassembly



5.1 Parts Condition Options

As illustrated in Figure 7, regarding the declared condition of the removed parts, there are essentially two possible outcomes; the parts are documented in As Removed (AR) condition, or if the disassembler is an MRO or Airline with appropriate procedures and capabilities, the parts can be tagged with an Authorized Release Certificate (ARC). In certain cases, when the airline itself (or its delegated certificated MRO; Part 145 Approved Maintenance Organization) the part is removed under established procedures, receive a serviceable tag and return to the airline's fleet.

In common practice the dominant outcome is that at the time of removal the parts are tagged in AR condition, with any subsequent MRO activity occurring after completion of the disassembly operations. The bottom part of Figure 7 describes the options that the disassembler has for parts removed and marketed in the future. These parts can be quoted and sold either as Serviceable (after being certified and issued an ARC) or as AR. If sold as AR, they have to be certified and issued an ARC if they ever return to service.

5.2 Safety Aspects/Unapproved Parts

For persons concerned about the possibility of unapproved parts, variously called SUPs (Suspected Unapproved Parts) or by the legacy term bogus parts, and which may be involved in the decommissioning marketplace, points of clarity and best practices should be established. IATA in its Safety Issues Hub (https://ic.iata.org/capture/safety-issue/126) collects and published information from various Aviation Authorities (AAs) about such parts.

5.2.1 AR Parts

As stated above, the most common dominant practice is that at the time of disassembly the removed parts intended to be reused will be tagged and represented in AR, As Removed condition. An AR part is neither a SUP nor a bogus part; it is simply an unserviceable part which can be equated to the legacy term Repairable, which simply means the part is able to be repaired (or Overhauled, Inspected, etc.), and is typically a rotable. Whereas AR can be equated to be a Repairable part, AR has the further inference of being associated with a disassembly.

Being that AR does not have a regulatory definition; its use occasionally falls outside the common understanding described herein. For example, a part may be in 'As Is' condition, but the seller instead uses the supposedly more palatable term of AR to market the part. The best defense for this is that the potential buyer asks to see the documentation of what it was removed from.

Note: *A part can be removed serviceable in As-Removed condition. If the aircraft condition does not support an operational test (e.g. cannot be hydraulically or electrically powered up) then the AR condition would be identified in the release certificate e.g. "Visual Inspection performed". AR could also mean removal of an unserviceable part.*

5.2.2 Unapproved Parts Notifications

When Aviation Authorities investigate and determine that unapproved parts exist and the aviation community should be notified of the details, an Unapproved Parts Notification (UPN) is issued. Other titles of such notifications may be issued such as Safety Alerts or Safety Notices among others. To date (and to our knowledge) there has been no UPNs or equivalent issued due to decommissioning activities Table 2 below shows an example of an SUP becoming a UPN under the FAA regulations.

Table 2
SUP to UPN

Concept	Status	Meaning	FAA Action
SUP	Suspected	A part may be unapproved; suspicion based on documentation, appearance, or traceability	Investigation begins (AC 21-29 procedures)
UPN	Confirmed	FAA has validated the part is unapproved	FAA publishes UPN and issues industry warnings
SUP → Investigated → **If validated** → **UPN**			

The best practice is to sign up for the free notifications, and two of the most common places to do this are at:

- FAA: https://www.faa.gov/aircraft/safety/programs/sups/upn
- EASA: https://www.easa.europa.eu/en/domains/aircraft-products/suspected-unapproved-parts

Those websites also contain instructions on how to file a report.

5.2.3 Best Practices to Mitigate Unapproved Parts

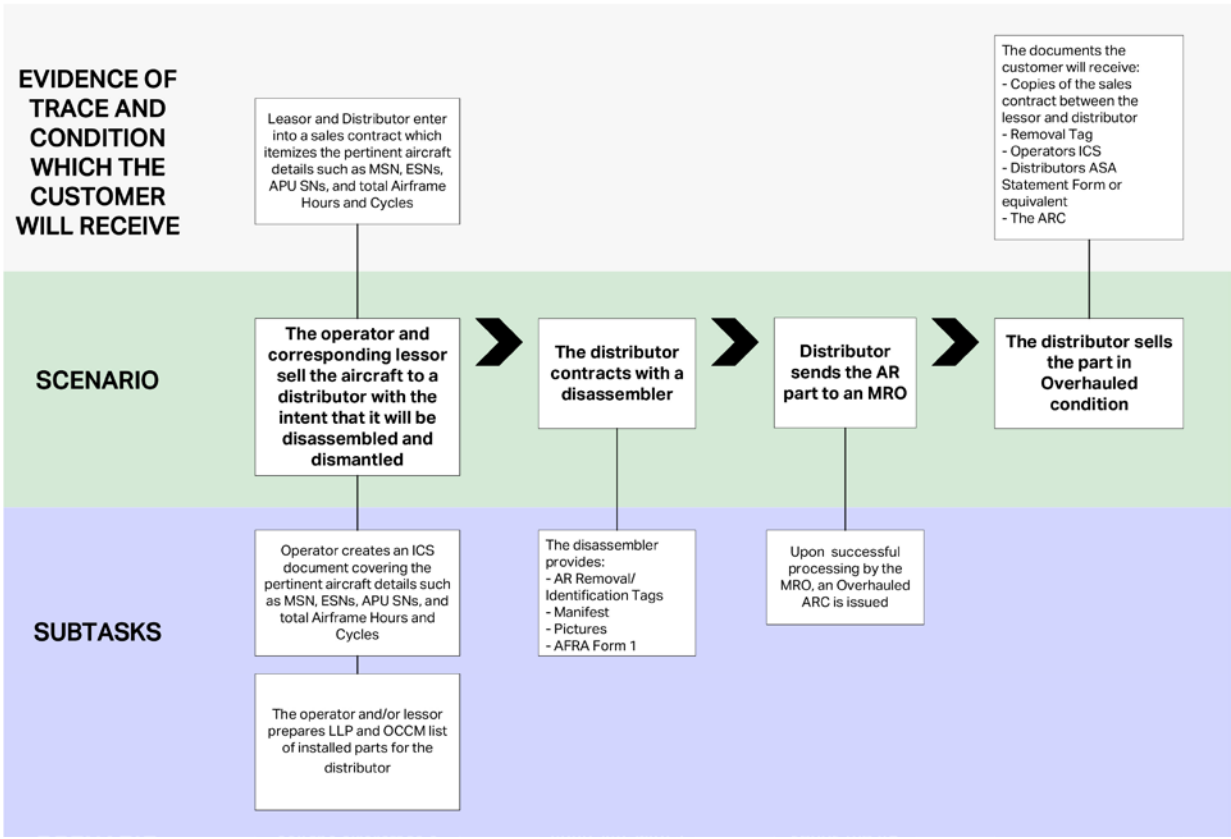
- Signup for notifications.
- Report suspected unapproved parts.
- Use only accredited firms as described in Chapter 3.
- Demand documentation as outlined in Chapter 6.

Chapter 6 - Trace Documentation and Reporting Details

6.1 Trace: Chain of Custody Practices

Trace, loosely defined as the chain of custody regarding the ownership of the parts, is not a regulatory requirement but has become a common commercial practice expressed as a requirement in Purchase Order terms and conditions. In the decommissioning, disassembly, and dismantling marketplace, the trace is expected to be to the last operator. The following figure illustrates a typical trace scenario:

Figure 8
Chain of Custody Practices



6.2 Removal/Identification Tag

At the time of disassembly, the parts are typically tagged with a document most commonly called a Removal or Identification tag. The accuracy and presence of this tag is a critical link in the trace file; it attests that the part was removed from the MSN or ESN of record. For purposes of trace, the preferred notation is for the MSN or ESN on the tag since it is recognized that aircraft registration numbers can change frequently and confuse the trace trail, whereas the MSN or ESN is fixed. The tags are company

created forms; except as described below in China (by the CAAC), There is no industry standard form, however it is a best practice that these contain provisions for:

(a) The Next Higher Assembly (NHA) the part was removed from, e.g., MSN, ESN, aircraft registration number (optional, but MSN has precedence), or manufacturer's serial number for assets which are not Engines or Airframes.

(b) Manufacturer's part number.

(c) Serial number (as applicable).

(d) Part description.

(e) Quantity (if applicable).

(f) Condition code.

(g) Date removed.

(h) Reason for removal (optional).

(i) The removal tag must be signed or stamped and dated by the facility or agency representative performing the disassembly. Optionally, the signature/stamp may be digitally generated.

(j) Although not required, it is a best practice and recommendation that the tag have a unique number, commonly called a tag number, which cross references to its place on the Manifest.

Note: *The tag is not the authoritative source of the part records, the tag's main purpose is for convenience and trace.*

6.2.1 Life Limited Parts (LLP) or Parts with Specified Overhaul Interval Requirements

For such parts, list the following on the tag as applicable:

- TSO: Time Since Overhaul.
- CSO: Cycles Since Overhaul.
- TSN: Time Since New.
- CSN: Cycles since new.

This is information derived from the last operator's logbooks and other forms of regulatory record-keeping requirements. Applicable excerpts of these records are expected to be provided to the buyer of such parts, and it is further expected that the buyer will express this in their Purchase Order terms and conditions.

6.2.2 CAAC Disassembly Tag

Based on the Civil Aviation Administration of China (CAAC) Advisory Circular AC-145-FS-2019-017, the Disassembly Tag described therein (see Appendix IV) is required for CAAC MROs approved for disassembly. If the disassembly does not intend to supply parts to Chinese aircraft operators, this Advisory Circular does not apply. The Disassembly Tag substantially contains the entries as suggested in Appendix IV. An unofficial translation of the Tag is presented in Appendix IV.

A revised version, AC-145-FS-017 R1, was released for public consultation and is not yet effective. The R1 expands applicability to MROs both within and outside China who intend to supply parts for return to service to aircraft operators registered in China. Although the attached excerpt is in Chinese, MROs have adapted the form and included English subtitles.

6.3 Manifest

The manifest may be expressed in two instances: 1) A list of the desired parts the aircraft (or engine) owner gives to the disassembler. 2) The final audited list of parts the disassembler compiles. Sometime this is called a Harvest List or Removed Parts List. 'Audited' in this sense means that the final list has been carefully inspected and cross checked against the actual removed parts for part number and serial number accuracy. This is important for two reasons:

- It is recognized that the list of parts provided by the airline or lessor is not always accurate regarding the actual installed part numbers or serial numbers, and it is the responsibility of the disassembler with the eyes and hands on the parts to accurately note any differences.
- It is this list which the owner of the parts will use for subsequent dispositioning of the inventory (see Chapter 7 regarding Reuse Options).

Best practices for manifests also include:

- The tag number of the removal tag (see 6.2 j). This makes it easy for the owners of the parts to audit the actual parts against the manifest and to locate the indexed pictures if taken.
- When the disassembler is tasked with shipping all the removed parts to the location designated, the box number where the part can be located is noted.

6.4 AFRA Form 0

The Aircraft Fleet Recycling Association's AFRA Form 0 (see sample in Appendix) was born of the industry's desire to standardize the attestation of the aircraft or engine End of Life event. Every aircraft or engine has a figurative 'birth certificate'; for aircraft its Airworthiness Certificate, and for engines it's new condition ARC. The AFRA Form 0 is the figurative 'death certificate'. The disassembler is responsible for the completion of this form. It is to be provided to the customer. The demise of the dataplate of the aircraft or engine is also accounted for on this form. Instructions for its use are contained on page three of the form.

6.5 Incident Clearance Statement

The Incident Clearance Statement or ICS (see two samples in Appendix II) was born of the industry's desire to eliminate the legacy Non-Incident Statement or NIS. The ICS found its introduction into the industry by inclusion in IATA's Guidance Material and Best Practices for Aircraft Leases. According to this document (5):

"Although there are no specific regulatory requirements to produce such documents, it is commonly accepted that an Incident/Accident Clearance Statement (ICS) formerly known as Non-Incident/Accident Statement (NIS) is provided by the last operator…The purpose of this incident/accident clearance statement is to remove the focus from whether or not an aircraft/engine/part has been subjected to an accident or incident and instead declare that the aircraft/engine/part has been deemed acceptable for continued use."

6.6 ASA Statement Form

For distributors who may be selling parts from a disassembly, it is common that the buyer will place in their PO terms and conditions, a requirement that the distributor provides their own, what is variously called a Material Certification, Certificate of Compliance, or generically a C of C. This typically implies that the distributor will issue their own ICS which should be based on the operator's provision of the same. The ASA Statement Form (see the Appendix for a sample) meets this requirement. According to the ASA (21):

“The ASA Statement form was created by the Aviation Suppliers Association to serve as a statement, in accordance with the requirements for a statement in FAA Advisory Circular 00-56B. It may also be used in other circumstances as a commercial statement concerning the identity and condition of an Article. “

The ASA Statement is intended to be completed as a document that accompanies civil aircraft Articles. It is commercial in nature, and a Seller who completes it does not need any special government certificate or approval to complete it. This ASA Statement is not intended to take the place of any document that is specifically required by airworthiness regulations. Where appropriate, and where intended by the Seller, the disclosures made on the ASA Statement may meet other regulatory requirements (such as requirements under export, import, or dangerous goods regulations, as indicated in the Remarks block by the Seller, or for use as a certificate of conformity where the Seller places certificate of conformity language in the remarks block).

Completion and retention of the ASA Statement form help to support commercial needs, and also may help the government to conduct safety investigations where such investigations are warranted.”

Background information: As with the relatively new ICS and AFRA Form 0, the ASA Statement Form was created to incorporate industry’s best practices. For example, it has built-in the ICS rather than the legacy NIS, and for these reasons is a recommended best practice. A legacy alternative which may be specifically required by buyers is the ATA Specification 106 Material Certification Form, which instead has built-in an NIS statement if needed. Note that the ICS is provided at the aircraft, engine and propeller level ONLY.

6.7 CAAC Database

For CAAC CCAR Part 145 MROs authorised to perform disassembly, it is required that the listing of the parts removed be entered into a secure database recognized by the CAAC (12). This registry currently resides with CAMAC, the Civil Aviation Maintenance Association of China.

Chapter 7 - Component Reuse and Recycling

7.1 Reuse

Upon completion of the decommissioning, disassembly, and dismantling operations the owner of the parts which are intended to be reused has several options regarding how the parts will be returned for active reuse, sometimes called reclaimed parts. The range of options is dependent on the functions performed by the owners. Options are summarized as follows:

Table 3
Typical Component/Parts Reuse Options

Owner of the Part	Place the Part into Inventory as a Spare for Flight Operations[1]	Reserve the Part for Scheduled MRO Operations such as Overhauls[1]	Sell the Part[2]
Airline/Operator	√	√	√
Leasing Company		√	√
MRO		√	√
Distributor		√	√
Disassembler		√	√

[1] The parts must be in serviceable condition accompanied by an ARC

[2] The parts can be sold in either AR condition or serviceable with an ARC

- **Reused as spares for flight operations**: Spares inventory can consist of New condition parts or USM. Given the well-known parts shortage phenomenon, USM has been steadily rising as a percentage of spares inventory, and a significant contributor to the USM market are the parts from disassembly activity.
- **Reuse for MRO Operations**: The use of the parts reserved for scheduled MRO operations such as Overhauls has arisen as a relatively recent option and growth activity. This is because:
  - It is well known that there is a shortage of many parts and disassembly has arisen as a means to mitigate this phenomenon. One of the areas impacted by shortages is the MRO industry. For example, in many cases turn-around times have been extended while the maintenance activities await needed parts. When the types of components and their part numbers are well known and repetitive, skilled maintenance planners will tap the disassembly industry to obtain those parts and reserve them for the planned activity. This has been shown to improve turn-around times.
  - When MROs have to replace parts during the maintenance activity, there are typically two options: Use New condition parts or when the customer authorizes it use USM, Used Serviceable Material. It is well known that the use of USM versus New material will reduce the overall cost of the maintenance activity, an overhaul for example, and not compromise safety or quality. A significant contributor to the USM market is the disassembly activity. In many cases the customer themselves may provide the USM to the MRO as Customer Provided or Supplied Material.
  - Typically, part of the leasing agreement with the operator is that they will pay into a maintenance reserve fund. The fund is then tapped to pay for the scheduled maintenance activity such as an overhaul. Many times, the lessor themselves will have to contract with an MRO to perform the overhaul. Since the reserved fund amount is fixed, it is in the interest of the lessor to take steps to assure the overhaul amount does not exceed the fixed reserve amount. One way is to use USM

sourced and reserved from disassembly activity. The lessor will issue this material to the MRO as Customer Provided or Supplied Material.

- **Trading of the parts**: Trading of the parts from disassembly typically consists of listing the parts on web-based platforms dedicated to this task which brings together the sellers and buyers. Popular platforms include but are not limited to:
  - Aeroxchange: https://www.aeroxchange.com/aexportal/
  - ILS, Inventory Locator Service: https://www.ilsmart.com/
  - Stockmarket: https://www.stockmarket.aero
  - IATA MRO SmartHub: https://www.iata.org/en/services/data/mro-insights/mro-smarthub/

Note that the IATA MRO SmartHub currently offers a platform to obtain commercial information about Parts and allows industry stakeholders to obtain evaluation information, benchmarking, parts availability, perform auctions or bids etc. In the near future, IATA plans to use the tool for advocacy purposes, on the basis of "give-to-get". The goal is to provide more transparency and efficiency in the struggling supply chain area that commercial aviation is struggling with.

7.2 Recycling

Following the disassembly and dismantling operations, the remaining activity is to recycle the left-over material. There are several possible outcomes in this regard:

- The material is repurposed: This has arisen as a growing method which appears to be only limited by the imagination. When the owner of this material makes it available for these purposes, best practices include that an agreement be implemented whereby the recipient agrees that the material will never be used except as stipulated therein. The owner should also search for and remove any dataplates. Repurposing activity typically consists of:
  - Sections of the fuselage cut and repurposed for training of flight attendants.
  - Flight deck sections cut and repurposed for cockpit simulators.
  - Sections provided for mechanic/technician training schools.
  - Sections provided for research and development.
  - Sections provided for transformation into hotels, restaurants, homes, and storage units.
  - Sections provided for static display such as in museums or company displays and lobbies.
  - Sections provided for the making of movies.
  - Parts provided for transformation into furniture: Meeting tables, coffee tables, clocks, storage cabinets, etc.
  - Chopped carpeting is used for playgrounds, chopped hard plastics are used in road
  - pavements, leather from seats in creating new ELeather products etc.
  - Material provided for inclusion as expressions of art, memorabilia, etc.
- The material is recycled into raw material that can be reused: This is classic recycling as is often thought of. For example, the resultant material, if metals, end up as ingots for sale to manufacturing firms. Metals are of high value, and they are even more valuable when the alloy composition of the original metal structure is available.
- For disposal and recycling evaluation at the end of life of an aircraft, more information is available at: https://www.mdpi.com/2076-3417/10/2/522/pdf
- For composite material recycling, more information is available at: https://www.mdpi.com/2504-477X/5/1/28

- The material is incinerated: For materials where there does not appear to be a recycling solution, this is one of the remaining options.
- The material goes to a landfill: For materials where there does not appear to be a recycling solution, this is one of the remaining options.

The greatest good for the industry and its environmental goals is that as much of the decommissioned aircraft gets reused or recycled as possible, but challenges remain in this regard and the amount of material truly recycled is surprisingly low, resulting in incineration and landfills. This is because aircraft content consists of so many specialty metals and materials which present challenges for finding sustainable and affordable recycling solutions. In order for recycling to be efficient, it is important to know the exact composition of raw materials involved during aircraft production from the manufacturers. The concept of an OAM/OEM produced publication at the time of aircraft certification (similar to the ARM - Aircraft Recovery Manual) should be invaluable. Such an "Aircraft Decommissioning Manual - ADM" should identify any special procedures and all materials in view of recycling. See Chapter 9: Innovations and Future Trends for research and development activities in this regard.

Figure 9 shows the Circularity Concept that needs to be considered during the Aircraft Design Phase.

Figure 9
Aviation Circularity in Aircraft Design Phase (22)

Chapter 8 - Waste Management and Environmental Compliance

8.1 Background

Waste management and environmental compliance is largely and commonly tied to the locale where the dismantling took place. This is because it is unlikely that anyone will pay the high costs to ship the material other than to local recyclers. Nearly every nation has its own environmental laws.

In practice, the entire decommissioning process involves two distinct instances of complying with the applicable waste management and environmental laws:

- During the disassembly and dismantling process.
- At the conclusion of dismantling, the material which has not been repurposed is submitted to the recycler who must follow the waste management and environmental laws applicable to their processes.

For many owners of aircraft and engines engaging in the decommissioning, disassembly, and dismantling process, the primary focus is on the proposed profitability or operational benefits of the project, with recycling, and therefor waste management and environmental compliance, typically being outsourced to the disassembler and/or dismantler to use the appropriate recycler. The owners simply do not consider recycling to be a core competency.

On the other hand, there are owners, disassemblers, and dismantlers who take the broad view of recycling as contributing to their environmental goals as may be integrated in their corporate plans, for example an ESG, Environmental, Social, and Governance framework. For such firms the following should be considered.

The Appendix V contains a listing of examples of dangerous goods and hazardous materials to be removed and treated properly from aircraft.

8.2 Material Traceability

One of the challenges in the dismantling process is material traceability once the materials leave the decommissioning site. This type of traceability is not to be confused with the part's trace of Chapter 6.

For safety and environmental reasons, it is important to be able to keep track of the materials and know where their final stage ends in the value chain. The aircraft owner and dismantling company should agree upon the responsibility for material traceability. Environmental best practices should include global recovery rates and avoid waste transboundary movement and shipments in territories with low environmental and safety standards, a phenomenon commonly called "environmental dumping". An example of environmental dumping is when electronic components or non-ferrous metals are found outside the country where the decommissioning site is located and subsequently processed in territories where vulnerable populations attempt to remove valuable metals in order to sell them. These populations then risk being exposed to environmental hazards and accidents as well as health hazards (i.e. exposure to toxic waste, such as lead, cadmium, mercury) due to poor environmental and safety regulations. In certain cases, materials in landfills can cause the pollution of under water reservoirs.

8.3 Waste Management Regulations

Waste regulations and standards exist in numerous countries. An example is the EU Directive on waste (Directive 2008/98/EC) establishing a legal framework for treating waste on its territory with the aim to

protect the environment and human health through proper waste management, recovery and recycling techniques to reduce pressure on resources and improve their use (23).

The European Commission adopted, in 2016, Commission Implementing Regulation (EU) 2016/1245 of 28 July 2016, "an implementing act setting out a preliminary correlation table between customs and waste codes". This tool is intended to enforce the European Waste Shipment Regulation so that customs officials will be able to identify potential waste streams more easily. The aim is to reduce illegal exports of waste out of the EU (24).

In that perspective, material traceability is, therefore, related to business ethics and the aircraft owner/ operator should include commitment and responsible practices by requesting and evaluating documents from the dismantling company that demonstrate reliable and efficient methods of treatment through sound EMS and material management tools. The dismantling facility's quality department can ensure that control of the dismantling activities is integrated into a verification system.

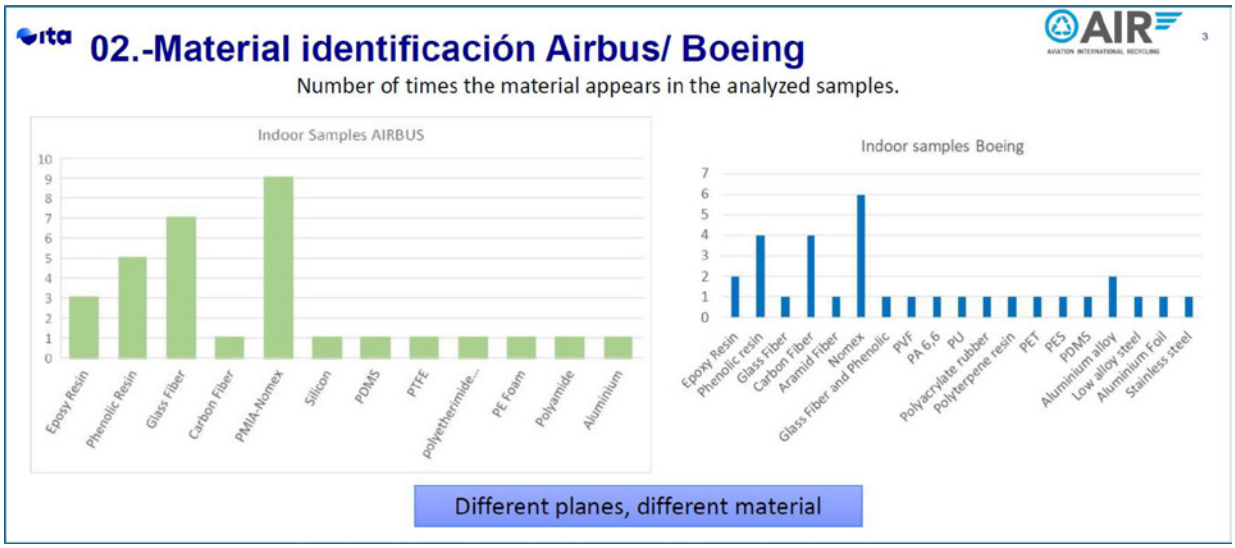
From an aircraft owner/operator's perspective, it is, therefore, recommended to add traceability provisions in the service agreement. They could include the name or the site of the subcontractors involved with the recycler or the dismantling company and the destruction and reclamation report issued to ensure safeguards and transparency of practices.

Traceability is an important part of best practices of the aircraft owner/operator. It is essential that each of the actors involved in the decommissioning process demonstrate best practices in the treatment of materials, especially as stringent aviation industry standards are applicable. For safety reasons, aviation authorities also have specific provisions regarding traceability of parts to prevent illicit resale of uncertified parts on the spare parts market. To ensure compliance with the provisions, the disassembly and dismantling facilities must provide the necessary documentation that are requested by transport authorities.

Chapter 9 - Innovations and Future Trends

9.1 The Challenges

In this marketplace a continuing focus of innovation, research and development is that of making end of life material, which is not being reused or repurposed to be truly recyclable and not disposed of by incineration and landfill. The concept of an Aircraft Decommissioning Manual - ADM developed by the OAM/OEM (mentioned earlier under 7.2 Recycling) should assist in proper recycling of various materials used in manufacturing. The continuing challenge is that aircraft and engines use highly specialized exotic materials whose recovery by recycling is not easily defined technically. Examples of constituent materials found in aircraft cabins are illustrated as follows (25):



Aircraft uses certain special materials that have been extremely difficult to remove and recycle properly as of today. They include (26):

- Halon fire extinguishers
- Plastic with fire retardant
- Unique aluminium alloys
- Chrome-6 paint
- Carbon Fiber Reinforced Plastic (CFPR)
- Fuel beyond the one contained in the fuel tanks

9.2 R&D Organizations

Organisations which seek to develop innovative methods to recycle these challenging materials include:

- Aethos Foundation (27): The Aethos Foundation is dedicated to finding sustainable solutions for the materials left behind when aircraft or their components reach the end of their life. Aethos wants to support everyone that conducts research into recycling of aircraft materials in a better way. The focus is on recycling of specific materials, components, or sections. Our wish is to especially support projects where the findings and results are free to be used by everyone. Examples of research network friends include:
  - ARN, Auto Recycling Nederland

  - Back to Battery BV
  - Delft University of Technology, Faculty of Aerospace Engineering, Aerospace Structures and Materials
  - Fraunhofer Institute for Chemical Technology ICT
  - H.J. Grimbergen BV
  - NLR - Royal Netherlands Aerospace Centre
  - Spiral RTC, Recycled Thermoplastic Composites
- AFRA is developing a network of research partners, who are invited to participate alongside the Association's Research & Development Committee to contribute their research content and expertise to advance the aircraft end-of-life industry.

  AFRA's research network will provide a valuable forum to bolster industry research and dialogue. Participants in this network will have access to a database of research reports, ability to coordinate with the AFRA R&D Committee members and fellow network participants for feedback on research, data collection, etc., and will have the opportunity to participate in AFRA conferences. Examples of research network participants include (28):
  - Adherent Technologies, Inc.
  - Aethos
  - Clausthal University of Technology
  - Delft University of Technology (TU Delft)
  - Embry-Riddle Aeronautical University
  - Envisa
  - Federal University of Rio de Janeiro (Coppe - Alberto Luiz Coimbra Institute for Graduate Studies and Engineering Research)
  - Fraunhofer Institute for Chemical Technology
  - Fundación CIDAUT
  - International Aerospace Environmental Group (IAEG)
  - Pforzheim University of Applied Sciences
  - Rochester Institute of Technology
  - Ryerson University
  - University of Pittsburgh
  - Utrecht University
  - XCrusher

9.3 Example Topics of Continuing R&D (29)

Recovery of Painted Composite Parts (No Core)

- Optimize processing conditions (shorter digestion times: 16 h, 8 h ...).
- Reduce formic acid volume in trials.
- Improve methods for removing paint and core residue to fully recover all 3 CF layers.
- Evaluate alternative rinsing and drying techniques (e.g., ambient conditions vs. vacuum).
- Explore pretreatment strategies to enhance diffusion rates.

Recovery of Other Composite Configurations

- Assess the influence of carbon fiber (CF) layer count on key parameters:
  - Digestion time
  - Diffusion time
  - Formic acid volume
- Investigate reuse/recycling options for Nomex core materials.

Improvement of Final Composite Properties

- Explore methods to enhance interfacial reinforcement of CF (literature review)
- Manufacture composites using larger CF fragments to allow full characterization.
- Use RTM and infusion techniques with the same resin as the original composite.
- Assess laminate quality: fiber/resin/void content.
- Work with larger sample sizes to enable comprehensive testing.
- Conduct full mechanical characterization: ILSS, Iosipescu, Shear, Compression / Compare virgin vs. recycled composites
- If no virgin reference material is available, produce it in-house and simulate aging.
- Consider different fabric types: unidirectional and multiaxial.

Industrial Process Scaling

- Analyze potential applications of recovered aerospace fabrics based on final mechanical properties.
- Study size distribution and quantity of recovered fabrics.
- Scale up chemical process: equipment, reagents, and timing.
- Perform cost analysis

In addition, AFRA's Research and Development Committee has these active topics under development:

- End of Service Composite Structure Sizing and Sorting Trial
- Cabin Interior Recycling

Appendices

Appendix I AFRA Form 0: Asset End of Life Certificate

AFRA FORM 0: End of Life Certificate

GENERAL

1. COMPANY INTIATING THIS FORM	
2. MSN/ESN/SN, SPECIFY:	
3. MODEL or DESCRIPTION	
4. FOR AIRCRAFT, SPECIFY HOW THE FOLLOWING WERE ACCOUNTED FOR:	
REGISTRATION:	
AIRWORTHINESS CERTIFICATE:	
5. SPECIFY HOW THE DATA PLATE WAS ACCOUNTED FOR: M/D/YYYY	

PART A: PERMANENT WITHDRAWAL FROM SERVICE

I hereby attest that the specified asset was removed from service with the intent to have it disassembled and that corresponding records are on file at this place of business.

6. PLACE WHERE DISASSEMBLY WILL OCCUR					
ADDRESS:					
CITY:		STATE:		ZIP:	
7.FIRM PERFORMING THE DISASSEMBLY:					
8. DATE THE ASSET WAS COMMITED TO DISASSEMBLY: M/D/YYYY					
9. NAME OF COMPANY OFFCIAL MAKING THIS ATTESTATION:					

10. SIGNATURE

_____ _____

Hand or digital signature **Date M/D/YYYY**

AFRA FORM 0, REV 0 Dated 8 Jan. 2026

Page **1** of **3**

AFRA FORM 0: End of Life Certificate

PART B: DISPOSAL FOR TREATMENT

Following the harvesting of the desired parts during disassembly, I hereby attest that the remainder of the noted asset will be demolished/destroyed to extent to preclude reentry into service, and that corresponding records are on file at this place of business.

If this attestation is based on a third party performing the demolishment/destruction, note this detail in the comments section.

If any part(s) of the remaining asset is/are committed for educational, display, or training purposes, this is noted in the COMMENTS field. In such cases we will assure that the agreement, contract, or equivalent will bind the party to never use or intend to reuse the asset for any reentry into service actions.

11. DATE THE ASSET WAS COMMITED TO DESTRUCTION: M/D/YYYY	
12. NAME OF COMPANY OFFCIAL MAKING THIS ATTESTATION:	
13. COMMENTS:	

14. SIGNATURE

_____ _____

Hand or digital signature **Date M/D/YYYY**

AFRA FORM 0, REV 0 Dated 8 Jan. 2026

Page **2** of **3**

AFRA FORM 0: End of Life Certificate

AFRA Form 0 Instructions

BACKGROUND:

This form constitutes a way, but not the only way of complying with the BMP ARTICLE XII END OF LIFE CERTIFICATION. This AFRA Form 0 was modeled based on suggestions from an AIRBUS Document "White Paper on Aircraft End of Life…", in which it recommended a Form with 'Permanent Withdrawal from Service' and 'Disposal for Treatment' entries. This accounts for these inclusions on this form.

INSTRUCTIONS:

As circumstances may require, Part A may be issued independently of Part B and visa versa, but the GENERAL section must always be completed.

Blocks:

1-3: Self Explanatory

4: Enter the information of who and how these were accounted for. This could include statements of actions by the previous owner/operator, or actions taken by the facility noted on the Form.

5: Enter the information of who and how this was accounted for. This could include a statement of actions by the previous owner/operator, or actions taken by the facility noted on the Form.

6-12: Self Explanatory

13: COMMENTS:

- If any part of the remaining asset was dedicated to other purposes such as educational, display, or training, the circumstances will be summarized in this block.
- If the demolishment/destruction was performed by a third party, enter the detail herein

14.Self Explanatory

AFRA FORM 0, REV 0 Dated 8 Jan. 2026

Page **3** of **3**

Appendix II Incident /Accident Clearance Statement (ICS)

Example 1: Aircraft

(ON COMPANY LETTERHEAD)

Date

Incident/Accident Clearance Statement

To Whom It May Concern:

Aircraft [enter registration], details of which are specified below, has been operated by [insert company name] during the period from [enter delivery date] to [enter redelivery date]. The aircraft has a valid Certificate of Airworthiness from [insert country of registration] as of the date of this statement.

Configuration details as of date of this statement;

Description	Type/Part No.	Serial No.	TSN	CSN
Aircraft				
Engine				
Engine				
Propeller				
Propeller				

I hereby certify that, to the best of my knowledge, during the period stated above:

1. Neither the aircraft, nor any part installed have been;

   a. damaged during, or identified as the root cause of, a reportable incident or accident as defined by Annex 13 to the Chicago Convention, or

   b. subjected to severe stress or heat (such as in a major engine failure, accident, or fire) or has been submersed in salt water,

   unless its airworthiness status was re-established by an approved maintenance organisation in accordance with the instructions of the type certificate holder and/or supplemental type certificate holder and/or OEM of the part, and supported by an authorised airworthiness release certificate.

2. No part has been installed on the aircraft which was obtained from a military source or was previously fitted to a state aircraft as deemed by Article 3 of the Chicago Convention.

Authorised Airline Representative

Signature: _____

Name: _____

Position: _____

Example 2: Engine

(ON COMPANY LETTERHEAD)

Date

Incident/Accident Clearance Statement

To Whom It May Concern:

Engine serial number [insert ESN], details of which are specified below, has been operated by [insert company name] during the period from [insert delivery date] to [insert redelivery date].

Configuration details as of date of this statement;

Description	Type/Part No.	Serial No.	TSN	CSN
Engine				

I hereby certify that, to the best of my knowledge, during the period stated above:

1. Neither the engine, nor any part installed have been

   a. damaged during, or identified as the root cause of, a reportable incident or accident as defined by Annex 13 to the Chicago Convention, or

   b. subjected to severe stress or heat (such as in a major engine failure, accident, or fire) or has been submersed in salt water,

   unless its airworthiness status was re-established by an approved maintenance organisation in accordance with the instructions of the type certificate holder and/or OEM of the part, and supported by an authorised airworthiness release certificate.

2. No part has been installed on the engine which was obtained from a military source or was previously fitted to a state aircraft as deemed by Article 3 of the Chicago Convention.

Authorised Airline Representative

Signature: _____

Name: _____

Position: _____

Guidelines

The purpose of this incident/accident clearance statement is to remove the focus from whether or not an aircraft/engine/part has been subjected to an accident or incident and instead declare that the aircraft/engine/part has been deemed acceptable for continued use.

The statement in paragraph 1 of the ICS provides confirmation that irrespective of the event the aircraft/engine/part has had been subjected to, its airworthiness has been re-established by an approved maintenance organisation in accordance with the applicable airworthiness regulations and instructions of the type certificate holder and/or supplemental type certificate holder (aircraft only) and/or OEM of the part.

The reason for changing focus is that the ICAO definitions of accident and incident (reference Chapter 1 'Definitions' of Annex 13 – 'Aircraft Accident and Incident Investigation' to the Chicago Convention) do not take into account the relative nature of the event and its direct impact on the aircraft/engine/part. Specifically with regard to the definition of incident, it is highly subjective and subject to various interpretations by different regulatory authorities as to what affects or could affect the safety of operation.

The statement in paragraph 2 provides additional confirmation, now customary in the industry that no parts have been obtained from a military source.

Paragraph 2 also provides a statement regarding parts on state aircraft, considered appropriate because of industry requests for clarification regarding government use. Article 3 'Civil and state aircraft' of the Chicago Convention states that military, customs and police aircraft are deemed to be "state" aircraft. These aircraft are not placed on the civil register, therefore are not regulated by the associated national civil aviation authority in accordance with ICAO Standards and Recommended Practices (SARPs). For the purposes of this declaration parts fitted to an aircraft that has transferred from a state to a civil register, may require special evaluation prior to regaining their status of being civil aircraft parts, the rationale being that the provenance of these parts, while on a state register may not be verifiable. While aircraft on the civil register are regularly contracted by governments for state business, because the operation occurs under civil rules and the aircraft remains on the civil register during the period of operation, parts from such an aircraft are considered to be civil aircraft parts, therefore reference is made to state rather than government use.

This document is intended to act as an industry acceptable common standard having relevance for the requirements of the commercial aviation industry. Application and use of this document commenced in late 2014 and is not intended to apply retrospectively, therefore previously issued incident / accident statements should retain their acceptability for historical reference. This document will be subject to periodic review and update, with the first review expected to take place in early 2016.

Two document templates have been designed, one to cater for aircraft, the other for engines. The engine template could also be used for individual parts in circumstances where incident / accident clearance statements are required, alternatively the certification provided in paragraphs 1 & 2 could be included in the remarks section of the ATA106 Spec for commercial trace.

Appendix III ASA Statement Form

1. Buyer's Purchase Reference #:	**3. ASA Statement Form 2020**	4. Seller's Name:
2. Buyer's Name:	5. Seller's Phone #:	9. Seller's Reference:
History use at least one — 11. Obtained From:	6. Seller's Email:	10. Seller's Address:
12. Entity of Last Certification:	7. Seller's Website	
13. Traceable To:	8. Seller's Other:	

14. Manufacturer	15. Part #	16. Description	17. Quantity	18. S/N or ID	19. Status

20. Remarks:

For New Articles ("New" in block 19)	For Other-Than-New Articles
21. New Article Certification: To the best of the Seller's knowledge, each article listed above is a new, unused, article and the information in this form is accurate.	***22. Certification:*** To the best of the Seller's knowledge, each article listed above is in the condition or status shown in block 19 and the information in this form is accurate. **23. *Public Aircraft Certification:*** To the best of the Seller's knowledge, each article listed above ◯ was ◯ was not previously installed in a public aircraft, such as a government use aircraft or a military aircraft.

24. Incident Clearance Statement (check only one – this Statement is made, to the best of Seller's knowledge)

A ◯ none of the above-listed article(s), has been:
1. damaged during, or identified as the root cause of, an accident/incident subject to mandatory reporting, nor
2. subject to severe stress or heat (such as in a major engine failure, accident, or fire) nor has been subject to unusual environmental conditions;

OR, if subject to 1 and/or 2 above, the airworthiness status of each article was re-established by an approved maintenance organization in accordance with instructions acceptable to the authority or authorities with oversight jurisdiction, as described in the authorized release certificate;

B ◯ article(s) listed above may or may not have been subject to damage, stress, heat or unusual environmental conditions that render their airworthiness condition unknown, and a hidden damage assessment or other inspection may be advisable before installation.

C ◯ article(s) listed above are in new, unused condition and have not been subject to damage, stress, heat or unusual environmental conditions that might reasonably have affected their airworthiness condition.

25. The signature below confirms, on behalf of the Seller named above, that the information in this form is true to the best of the Seller's knowledge.

26. Signature	27. Name	28. Identifier	29. Date

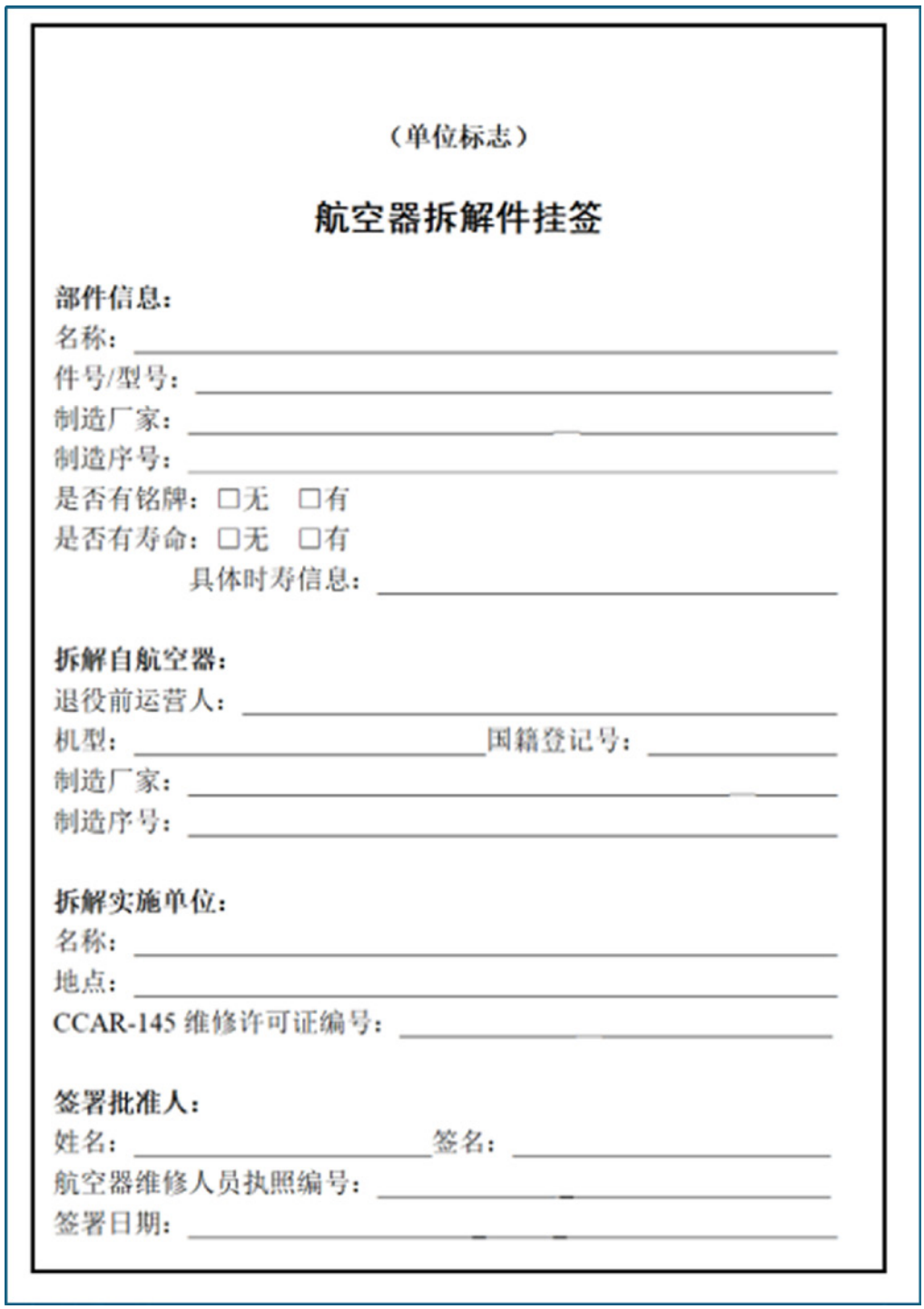
NOTICE: This document makes no independent representation that the part is airworthy, or that it is acceptable for installation. These determinations are to be made by installer, based upon an inspection of the part and its related evidence. Form instructions are available on https://www.aviationsuppliers.org.

Rev. 1.1 (2021-10-11)

Appendix IV CAAC Disassembly Tag

(in CAAC AC-145-FS-2019-017)

Front



（单位标志）

航空器拆解件挂签

部件信息：

名称：_____

件号/型号：_____

制造厂家：_____

制造序号：_____

是否有铭牌：□无 □有

是否有寿命：□无 □有

具体时寿信息：_____

拆解自航空器：

退役前运营人：_____

机型：_____ 国籍登记号：_____

制造厂家：_____

制造序号：_____

拆解实施单位：

名称：_____

地点：_____

CCAR-145 维修许可证编号：_____

签署批准人：

姓名：_____ 签名：_____

航空器维修人员执照编号：_____

签署日期：_____

Back

（单位标志）

航空器拆解件挂签

声明：

兹声明此部件来源真实可靠，并且没有经历过：

- 严重事故；
- 浸入盐水或暴露在其他腐蚀性介质；
- 过热或其他形式的极限应力作用；
- 军用或其他非民航运营使用。

使用者职责：

本文件仅意味此部件的拆解工作符合经批准的标准，但不代表可以直接安装到有关航空产品上使用。使用者应当确保此部件按照经批准的标准维修并放行后方可使用。

Unofficial Translation

Front

ORGANIZATION LOGO

Aircraft Disassembly Part Tag

PART INFORMATION: _____

Name: _____

Part Number / Model Number: _____

Manufacturer: _____

Manufacturing Serial Number: _____

Has Nameplate? ☐ No ☐ Yes

Is Life-Limited? ☐ No ☐ Yes

Specific Time/Cycle Information: _____

AIRCRAFT WHICH THE PART IS DISASSEMBLED FROM:

Operator Prior to Retirement: _____

Aircraft Type: _____

Nationality - Registration Number: _____

Manufacturer: _____

Manufacturing Number: _____

DISASSEMBLING ORGANIZATION:

Name: _____

Location: _____

CCAR-145 Maintenance License Number: _____

AUTHORIZATION SIGNATORY:

Name: _____

Signature: _____

Aircraft Maintenance Personnel License No.: _____

Date of Signature: _____

Back

ORGANIZATION LOGO

Aircraft Disassembly Part Tag

DECLARATION:

This part is declared to have a verifiable and reliable source, and has not been subjected to:

- Serious accidents.
- Immersion in saltwater or exposure to other corrosive media.
- Overheating or other forms of extreme stress.
- Military use or any non-civil aviation operational service.

USER RESPONSIBILITY:

This document only certifies that the disassembling process of this part complies with approved standards. It does not imply that the part may be directly installed on any aircraft product for being used. The user shall ensure that the part is maintained and released in accordance with approved standards before being used.

Appendix V Examples of Dangerous and Hazardous Materials to be Removed and Treated from Aircraft

- Asbestos
- Chemical oxygen generator assembly
- Contaminated absorbent (oil and fuel)
- Coolant with fluorocarbon
- Depleted uranium (ballast weights in aircraft manufactured until the early 1980s)
- Engine/turbine oil
- Fire extinguisher (bromotrifluoromethane, halon 1301, carbon dioxide)
- Fuel
- Glycol-based deicer
- Hydraulic oil
- Hydraulic oil filters
- Lead-acid batteries
- Lithium batteries fitted to cockpit voice recorder (CVR) and flight data recorder (FDR)
- Material containing mercury (e.g. fluorescent tubes, beacon anti-collision lights, other types of lamps, breaking system, suspension system, safety sensors)
- Nickel-cadmium batteries
- Nitrogen cylinders
- Organic solvent
- Oxygen cylinders
- Oxygen masks
- Rain repellent fluid system
- Escape slide and raft
- Squib
- Tires
- Underwater locater locator beacon (ULB)
- Wastewater

Appendix VI Hazardous Fluids Contained in an Aircraft and their European Waste Codes

(*: record of waste disposal required in the EU)

Hazardous Fluids	European Waste Codes
Fuel oil and diesel	130701*
Brake fluids	160113*
Antifreeze fluids	160114*/15
Oil filters	160107*
Synthetic hydraulic oils	130111*
Mineral-based non-chlorinated engine, gear and lubricating oils	130205*
Petrol	130702*
Aqueous liquid wastes (feces)	161002*
Explosive components (fire extinguisher bottles, escape slide bottles)	160110*
Components containing PCB (capacitors, sealants)	160109*
Brake pads containing asbestos	160111*/12
Components containing mercury (fluorescent lamps)	160108*
Insulation materials containing hazardous substances (mineral/ glass fiber produced until about 1995)	170603*
Chlorofluorocarbons (CFC), Hydrochlorofluorocarbons (HCFC), Hydrofluorocarbons (HFC)	140601*
Lead batteries	160601*
Ni-Cd batteries	160602*
Gases in pressure containers (halon, fire extinguishers)	160504*
Absorbents, filter material (cabin air filters)	150202*
Smoke detectors	Atomic Energy Acts of individual States
Fluorescent signs	Atomic Energy Acts of individual States
Depleted uranium ballast weights (aircraft manufactured until the early 1980s)	Atomic Energy Acts of individual States

Appendix VII Sample CAAC Part 145 Dismantling Approval

中国民用航空局
CIVIL AVIATION ADMINISTRATION OF CHINA (CAAC)

许可维修项目
LIMITATION OF MAINTENANCE ITEMS

限定/LIMITATION:

对第[redacted]号许可证所列维修类别限定如下地点和项目：

Location and items set forth on Maintenance Organization Certificate No.[redacted] is/are limited to the following:

[redacted]

其他：

[redacted]

航空器拆解：B737NG、B737CL 系列，A320 系列、A330 系列。

– ☆ –

Aircraft Dismantling

Series

Obtained from publicly available information at:
https://fsop.caac.gov.cn/g145/CARS/WebSiteQueryServlet

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