

# Disassembly Practice Guide and Minimum Standards

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## Aircraft Fleet Recycling Association



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### Title Page

# Disassembly Practice Guide and Minimum Standards

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## **Disassembly Practice Guide and Minimum Standards**

### **DEFINITIONS**

**Best Practice** means a practice that is specifically recommended by this document. It does not necessarily infer that a related regulatory mandate exists (nor that such a mandate should exist). If a Facility voluntarily chooses to comply with this Best Management Practice, then in order to remain in compliance, the Facility must follow each Best Practice found in this document as determined by the AFRA certification process.

**Practice Guides** reflect advice from AFRA on how to meet the principles established by the Best Practices. Generally, they reflect one way but not necessarily the only way to meet the Best Practice. In some cases they might reflect the only practical manner in which to meet the Best Practice, and in other cases a Facility may employ other approaches that could be judged to meet the Best Practice.

A **Minimum Standard** states the minimum requirement in order to pass the AFRA BMP audit on the first audit. A company that does not meet the minimum standard will not pass the audit. Minimum standards do not take the place of the BMP Best Practice Standards; they are advisory in nature and they are meant to establish minimum levels for companies new to the industry. Companies are expected to evolve their own quality systems beyond the Minimum Standards in order to meet the intent of the BMP Standards. As the industry evolves, AFRA expects that the AFRA BMP Committee will raise the Minimum Standards.

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### ***Article II b) BMP System Requirements***

**BEST PRACTICE (II)(b) 1** - Each accredited company shall have a BMP Manual.

**Practice Guides:**

1. The manual may consist of assigned hard copies or electronic copies (such as PDF) available to staff, or a combination of these two.
2. Care should be taken to assure that unauthorized staff do not have access to the manual which can be edited; this is to prevent unintended alterations.

**Minimum Standards**

A current manual available to staff

**BEST PRACTICE (II)(b) 2** - The BMP Manual is made up of all of the Procedures reflecting the company's compliance with this BMP.

**Practice Guides:**

1. Where there is a stand-alone BMP manual, it is preferable for it to be structured to sequentially reflect the BMP format for the numbering of the Articles.

**Minimum Standards**

A manual which addresses all the requirements of the current BMP.

**BEST PRACTICE (II)(b) 3** - This BMP manual may be part of another manual system, and/or it may incorporate and/or commingle issues that are not reflected within this BMP; however the procedures found within the BMP Manual should include references to the BMP sections that they are each designed to meet, either in the procedures themselves, in the headings to the procedures, or in an index to the BMP Manual and its procedures.

**Practice Guides:**

1. In such cases, it is recommended that a cross reference table be established that shows all the BMP Articles and where the applicable procedure may be found.

**Minimum Standards**

All procedures which have applicability to demonstrate compliance with the BMP are unambiguously labeled or referenced as such.

**BEST PRACTICE (II)(b) 4** - The BMP manual must have a change management tracking system, such as a list of sections affected that tracks the revision history of the BMP Manual.

**Practice Guides:**

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1. Manuals can have a separate or combined revision elements as follows:
  - A Record of Revision page (ROR). This page shows the sequential issued revision numbers and the corresponding date. It is recommended that a brief reason be entered stating the reason for the revision.
  - List of Effective Pages (LOEP). This is used in cases where a given revision only changes the effected pages, and the unaffected pages remain at their last revision. With this arrangement the LOEP shows the revision status of each page of the manual. In cases where it is policy that each revision changes the entire manual, an LOEP is not necessary.
  - In order for staff to quickly identify the revised subject matter for a given revision, it is recommended that a visual means to highlight the revised passage be implemented. For example, use of colored highlighted sentences, or a vertical line in the left margin adjacent the revised passage.

### **Minimum Standards**

A demonstrable means for tracking changes and revisions.

**ARTICLE III - FACILITY (including infrastructure & management process)**

***Article III a) - Location characteristics; Identification and Compliance with Relevant Standards***

**BEST PRACTICE (III)(a) 1** - The Facility shall have a fixed location for disassembly, or a procedure for assuring that the location for disassembly is adequately prepared, or both.

**Practice Guides**

1. Although such procedures are not a required part of the standard, a facility may wish to consider procedures for addressing local jurisdiction compliance requirements like:
  - appropriate business permits
  - appropriate fire department permits
  - appropriate airport permits
  - other appropriate local jurisdiction requirements.
2. Because work flow and work flow areas can change frequently based on what materials are in the facility at any time, work flow may be a description that is separate from the work area map; this is not meant to proscribe a map-based description of work flow in a facility with a relatively static map of work flow.

**Minimum Standards**

Work area map showing major area locations with description of work flow.

**BEST PRACTICE (III)(a) 2** - If the Facility has a fixed location for disassembly, then the Facility shall identify, and ensure compliance with, applicable environmental laws and standards.

**Practice Guides:**

1. Ensuring compliance may require periodic auditing.
2. The Facility should have spill prevention and response procedures.
  - The Facility should have a process for preventing the release of hazardous substances.
  - The Facility should consider control technologies designed to permit capture and/or reclamation of

## Disassembly Practice Guide and Minimum Standards

- fluids that may come out of an Asset or Materials for Recycling.
  - The Facility should have training associated with this procedure
3. Ensuring compliance may require implementation of certain control technologies.

### Minimum Standards

A procedure denoting process for ensuring compliance and the assignment of responsibility for knowing applicable laws and assuring compliance

**BEST PRACTICE (III)(a) 3** - If the Facility disassembles Assets at locations remote from the Facility's main location(s), then the Facility shall have one or more procedures designed to identify, and ensure compliance with, applicable environmental laws and standards.

### Practice Guides:

1. Ensuring compliance may require an initial audit of the location at which the disassembly will take place to identify compliance issues, followed by a post- implementation, pre-disassembly audit to ensure compliance.
2. The Facility should have spill prevention and response procedures.
  - The Facility should have a process for preventing the release of hazardous substances.
  - The Facility should consider control technologies designed to permit capture and/or reclamation of fluids that may come out of an Asset or Materials for Recycling.
  - The Facility should have training associated with this procedure
3. Ensuring compliance may require implementation of certain control technologies.
4. If the Facility uses the same procedure for remote locations as the procedure for the main location then a single procedure may be sufficient for all locations.

### Minimum Standards

A procedure denoting process for ensuring compliance and the assignment of responsibility for knowing applicable laws and assuring compliance



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**BEST PRACTICE (III)(a) 4** - If the Facility has a fixed location for disassembly, then the Facility shall identify, and ensure compliance with, applicable occupational health and safety laws and standards.

**Practice Guides:**

1. Many jurisdictions have laws that require an employer to protect the employees from reasonably identifiable hazards to health and safety.
2. Ensuring compliance may require periodic auditing.
3. Occupational health and safety laws and standards often include training requirements
4. There are special dangers inherent in disassembly. Immediate dangers include dangerous goods (hazardous materials), and the weight of the asset or materials; but less obvious are the long term dangers to health, like carcinogens and radioactive materials.

**Minimum Standards**

A procedure denoting process for ensuring compliance and the assignment of responsibility for knowing applicable laws and assuring compliance

**BEST PRACTICE (III)(a) 5** - If the Facility disassembles Assets at locations remote from the Facility's main location(s), then the Facility shall have one or more procedures designed to identify, and ensure compliance with, applicable occupational health and safety laws and standards.

**Practice Guides:**

1. Many jurisdictions have laws that require an employer to protect the employees from reasonably identifiable hazards to health and safety.
2. Ensuring compliance may require an initial audit of the location at which the disassembly will take place to identify compliance issues, followed by a post- implementation, pre-disassembly audit to ensure the health and safety of the employees are protected.

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3. Occupational health and safety laws and standards often include training requirements
4. There are special dangers inherent in disassembly. Immediate dangers include dangerous goods (hazardous materials), and the weight of the asset or materials; but less obvious are the long term dangers to health, like carcinogens and radioactive materials.
5. If the Facility uses the same procedure for remote locations as the procedure for the main location then a single set of procedures may be sufficient for all locations.

### **Minimum Standards**

A procedure denoting process for ensuring compliance and the assignment of responsibility for knowing applicable laws and assuring compliance

**BEST PRACTICE (III)(a) 6** – When disassembly is contracted to a third party firm, the facility shall have a procedure for evaluating and selecting the disassembly facility so as to assure the contracted firm can adequately meet the Facility’s AFRA BMP Requirements.

### **Practice Guides:**

1. The BMP contains many requirements applicable to the process of disassembly. When the Facility chooses to out-source a disassembly project, there must a procedure in place which assures those requirements are being upheld.
2. Examples of how a Facility may make such assurances include but are not limited to:
  - a. Using other AFRA accredited facilities.
  - b. Flowing down all applicable requirements in the form of an agreement or contract.
3. Performing and documenting an on-site audit of the contractor to assure the requirements are being met.

### **Minimum Standards**

A procedure denoting the method used evaluate, select, and assure the contractor is meeting applicable BMP requirements.

## **Disassembly Practice Guide and Minimum Standards**

**BEST PRACTICE (III)(a) 7** – When Recycling is contracted to a third party firm, the facility shall have a procedure for evaluating and selecting the Recycling facility so as to assure the contracted firm can adequately meet the Facility’s AFRA BMP Requirements.

**Practice Guides:**

1. The Recycling BMP contains many requirements. When the Facility chooses to out-source a Recycling project, there must a procedure in place which assures those requirements are being upheld.
2. Examples of how a Facility may make such assurances include but are not limited to:
  - a. Using other AFRA accredited facilities.
  - b. Flowing down all requirements in the form of an agreement or contract.
3. Performing and documenting an on-site audit of the contractor to assure the requirements are being met.

**Minimum Standards**

A procedure denoting the method used evaluate, select, and assure the contractor is meeting applicable Recycling BMP requirements.

### ***Article III b) - Security***

**BEST PRACTICE (III)(b) 1** - The Facility shall establish a secure area in which disassembly will take place.

**Practice Guides:**

1. Security protocols for the disassembly areas should be established and maintained. They should be adequate to protect the Asset, the parts, and/or the materials from loss, contamination, and from unwanted comingling.
2. Customer contracts may require certain security measures. The Facility should ensure that it has a procedure for implementing security that is consistent with contractual requirements.
3. If maintenance is performed at the Facility, the secure disassembly should be separate from any area where maintenance is performed.
4. Security standards for a remote or mobile location may be different from those for a permanent location.

**Minimum Standards**

A written description of how security will be maintained; and actual

## **Disassembly Practice Guide and Minimum Standards**

implementation of that security description at the time the disassembly is performed.

**BEST PRACTICE (III)(b) 2** – The Facility shall establish secure areas and segregation of removed parts during the disassembly, parts tagging, and preparation for transit activities. Secure areas shall also be established for all materials identified to be recycled through the destruction process and final transport to the recycling facility

### **Practice Guides:**

1. Parts should be moved from the staging area to the storage area when the Facility verifies that they have been properly identified. Parts being moved into the storage area may be held for shipping to a customer, shipping to a maintenance provider, or other purposes.
2. Generally, Materials for Recycling should be segregated.
3. Customer contracts may require certain security and segregation measures. The Facility should ensure that it has a procedure for implementing security and segregation that is consistent with contractual requirements.
4. In a mobile environment, and in some fixed environments, the Facility may need to develop security methods or procedures to guard against passers-by (like persons on an airport property), which can lead to a casual loss of parts or material.
5. In a mobile or remote location, security may include fencing-in or otherwise segregating the location at which disassembly is taking place.
6. In a mobile or remote location, security may include use of lockable containers or a local storage partner with a facility for storage.
7. If maintenance is performed at the Facility, the secure storage area should be separate from any area where maintenance is performed.

### **Minimum Standards**

Written description of how security will be maintained; and having such areas during storage. Procedures for security implementation if the Facility conducts the disassembly at remote or off-site locations.

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**BEST PRACTICE (III)(b) 3** – The Facility shall establish procedures and infrastructure to prevent material from leaving the Facility in a manner inconsistent with the intent of the Facility.

**Practice Guides:**

1. The security system should prevent unwanted loss.
2. Unwanted loss can include theft, or disposition of material inconsistent with contractual obligations.

**Minimum Standards**

A procedure for controlling the dispatch or disposal of material.

### ***Article III c) – Storage and Segregation of Materials***

**BEST PRACTICE (III)(c) 1** - A disassembly Facility shall establish a segregated Electro-Static Discharge (ESD) area for processing avionics and other equipment that may be subject to damage due to electro-static discharge.

**Practice Guides:**

1. This area should have environmental controls adequate to protect the parts (e.g. air conditioning and humidity control as necessary).
2. This area should be free of dust, and should include control technologies designed to reduce and/or eliminate ESD.
3. With the increased use of carbon fiber composites in aircraft, this area should include necessary controls to reduce or eliminate the exposure of electronics to carbon fiber particles that may be generated during **disassembly**.

**Minimum Standards**

Typical work area map designating ESD area, test procedure, plus documentation of appropriate training

**BEST PRACTICE (III)(c) 2** - A disassembly Facility shall establish a secure, Asset-specific, staging area into which removed parts will be moved for identification and processing.

**Practice Guides:**

1. Where the Facility has more than one **disassembly** project, the Facility should segregate parts removed from one Asset from the parts removed from another Asset.

## Disassembly Practice Guide and Minimum Standards

2. The secure staging area should be separate from any area where maintenance is performed.

### Minimum Standards

Description of how segregation of different assets will be achieved and how security of each area will be maintained and having such an area during staging.

**BEST PRACTICE (III)(c) 3** - A disassembly Facility shall have a procedure for identifying a secure method for moving the Asset to the location where it will be disassembled.

### Practice Guides:

1. The Facility's procedure may be that it disassembles Assets where they are found or at the customer's location.
2. The Facility and the customer should clarify, in writing, which party has responsibility for transferring the Asset from its current location to the **disassembly** location.
3. If the Asset will be operated to the **disassembly** location, then the person responsible for movement of the Asset must confirm that it has appropriate regulatory authority to move the Asset, where such authority is necessary.
4. The Facility should confirm that there is adequate landing space and storage space at the location where the **disassembly** will occur.
5. When the Asset arrives at the disassembly location, the Facility may want to conduct a walk-around of the Asset to ascertain its condition at the time of arrival. A video-tape or photographic record would allow the Facility to document the Asset's arrival condition. The Facility may wish to record the condition of the items like the engines and other high-value assemblies and parts.
6. When the Facility is responsible for the shipping of an engine, the Facility should use air-ride trucks and shock-mounted stands. The Facility should also secure the fan-blade prior to transportation so the engine does not rotate during transportation.
7. In its plans, the Facility may wish to consider one or more of these issues associated with the transfer of the Asset:
  - Tax laws
  - Export laws of the source location
  - Import laws of the disassembly location
  - Airworthiness and aviation safety laws affecting the

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movement of the Asset, including ferry permits and other laws of both the source and disassembly locations

- Liens and other encumbrances on the Asset
- Practical concerns like whether the Asset is airworthy, where the Asset will clear customs, etc.

### **Minimum Standards**

The Facility should have a written procedure.

### ***Article III d) – Inventory Accounting & Audits***

**BEST PRACTICE (III)(d) 1** - The Facility shall have a procedure for periodic internal audits to the BMP Checklist.

#### **Practice Guide:**

1. Periodic verification of internal practices through auditing controls and procedures helps to assure that internal procedures are followed.

#### **Minimum Standards**

Procedure and copies of audit records (preferably using BMP checklist)

**BEST PRACTICE (III)(d) 2** - The Facility shall have a procedure for retaining documentation of periodic internal audits on how the company is following this Guidance, including results, and (where necessary) root-cause analysis, and corrective actions taken. Records required for the purpose of this best practice article must be kept for a period of at least two (2) years.

#### **Practice Guides**

None

#### **Minimum Standards**

Procedure and an archive that may be reviewed by the auditor during the audit.

**BEST PRACTICE (III)(d) 3** - A disassembly Facility shall have a written procedure for periodic verification of reclaimed parts and assemblies inventory through auditing controls and procedures.

#### **Practice Guides**

1. The Facility should follow its own inventory and quality auditing practices.

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2. A disassembly Facility should check for package deterioration and integrity.
3. The Facility should verify that items in inventory with shelf-life limits have not reached their shelf-life limits.
4. When a physical inventory shows that there are items or materials missing that belong to an owner other than the Facility, such shortages should be disclosed to the owner of the missing items or materials.
5. When a physical inventory shows that there are items or materials missing, the Facility should perform a root cause analysis to discover why the items or materials are missing.

### **Minimum Standards**

A disassembly Facility must have a procedure for inventory verification against loss. Maintain on-site records

**BEST PRACTICE (III)(d) 4** - In the event that periodic verification shows an unexplained loss, or a failure to meet the Facility's quality expectations, the Facility shall investigate and seek an explanation for the loss or failure.

### **Practice Guides:**

1. The Facility should consider a procedure for promptly reporting loss of Customer-owned material or parts to the affected Customer.

### **Minimum Standards**

Procedure for investigative action, such as root cause analysis, and maintenance of records of root cause analysis.

**BEST PRACTICE (III)(d) 5** - Following investigation of a loss, the Facility shall develop and implement appropriate corrective action.

### **Practice Guides:**

NONE

### **Minimum Standards**

Procedure and maintain records of corrective action

## ***Article III e) – Process Flow and Process Management***

**BEST PRACTICE (III)(e) 1** – The Facility should have a diagram that is marked to show process and / or material flow through the Facility.

### **Practice Guides:**

1. The Facility may be using the same location for different



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- purposes based on different operations. Therefore, the diagram may reflect the other uses of the locations.
2. Equipment can be used for different purposes. There may be different flow diagrams for different product streams. For this reason, this often should be a flow diagram rather than a facility map.

### Minimum Standards

Diagram that is marked to show process and / or material flow through the Facility.

## ARTICLE IV – TRAINING

**BEST PRACTICE (IV)(a) 1** – The Facility shall prepare training records to document the way that it has met its training requirements.

### Practice Guides:

1. Each training record may include
  - A description of the training;
  - Date and length of instruction;
  - Name of the student;
  - Name of the person (instructor) and organization conducting the training (the organization may be the Facility itself, such as when OJT is provided);
  - Any additional information required by custom, law or regulation.

### Minimum Standards

Record showing that employees have been trained appropriately.

**BEST PRACTICE (IV)(a) 2** – A disassembly Facility shall ensure that it has personnel to perform the disassembly who have been trained in relation to the disassembly information from the manufacturer’s technical manuals.

### Practice Guides:

1. This Best Practice recognizes the benefit of crews (especially crew leaders) having training (or demonstrated practical experience) for the specific Assets that the facility handles.
2. Manufacturers publish technical manuals that include **disassembly** instructions. In some jurisdictions, manufacturers are required by law to provide such manuals to an Asset owner and or operator. If the Facility does not have the technical manuals, then it should seek to obtain them from the owner of the Asset.

## **Disassembly Practice Guide and Minimum Standards**

3. **Disassembly** personnel should be able to understand how to use the manufacturer's disassembly instructions.
4. The Facility should assure that **disassembly** personnel have received model-specific training related to the disassembly tasks they perform.
5. The Facility should assure that the personnel responsible for parts preservation have received training related to the parts preservation practices.
6. The Facility should assure that the personnel responsible for parts handling have received training related to the parts preservation practices.

### **Minimum Standards**

Record showing that employees have been trained to use the product manuals.

**BEST PRACTICE (IV)(a) 3** – A disassembly Facility shall ensure that the disassembly personnel have received appropriate training related to the functions they perform.

### **Practice Guides:**

1. Useful training topics for disassembly personnel may include:
  - Hazard identification and self-protective training;
  - Training in recognition and identification of parts that are considered to be subject to shipping regulations;
  - Training in recognition and identification of parts that are considered to be subject to import and/or export restrictions;
  - Document recognition and creation standards.
  - BMP procedures applicable to job function(s) performed.

### **Minimum Standards**

Records that employees are trained in basic facility operations and procedures, including documented training that all employees who handle parts have job-specific training.

## **Disassembly Practice Guide and Minimum Standards**

### **ARTICLE V – DOCUMENTATION & RECORDS**

#### ***Article V a) – Asset and Transaction Records***

**BEST PRACTICE (V)(a) 1** – A disassembly Facility shall have a procedure for identifying, collecting and reviewing the appropriate records related to the Asset.

**Practice Guides:**

1. The records that you need will depend on the regulatory requirements of the government(s) with appropriate oversight and the commercial requirements of the customers. Records that may be useful include, but are not limited to:
  - Aircraft logbooks;
  - Maintenance records;
  - Life limited parts information, ranging from current status information (required by some governments, e.g. 14 C.F.R. § 43.10 in the United States) to back-to-birth traceability (a common commercial requirement);
  - All historical records pertaining to any parts that may have value;
  - Records concerning compliance with maintenance

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- requirements (ADs/service bulletins);
  - Data approvals for repairs and alterations;
  - Traceability to the last operator of the Asset (particularly where the Asset was received from a leasing company, insurance company, or other non-operator);
  - Records concerning past events associated with the airframe, including incidents/accidents, unusual heat stress or environmental conditions.
2. Generally, it is recommended that the records be collected and reviewed as necessary prior to beginning the disassembly process, because this collection and review process may aid in the preparation of an accurate manifest.
  3. If any of the parts of the asset are intended to be returned to the stream of commerce for use in an aircraft, then it is common practice for companies that will return the parts to the stream of commerce to seek out
    - (a) A statement concerning any past Airworthiness Event that may have affected the asset, or
    - (b) Records sufficient to permit the Facility or a contractor to develop a statement concerning any past Airworthiness Event that may have affected the asset.
  4. Based on past industry standards, a statement that the asset has not been involved in an accident is frequently sufficient to meet commercial requirements.

### Minimum Standards

Procedure for identifying, collecting and reviewing the appropriate records related to the Asset.

**BEST PRACTICE (V)(a) 2** – A disassembly Facility shall have or prepare a manifest of parts expected to be removed from the Asset.

### Practice Guides:

1. The manifest should identify all parts that are expected to be removed from the Asset.
2. Either the manifest should be created by the Customer or the Customer should agree to the manifest if it is not created by the Customer
3. By researching the likely value of the parts at the time the manifest is created, the creator of the manifest may make informed cost-benefit decisions about whether to invest time and resources into removing certain parts from the Asset.
4. The creator of the manifest may wish to also consider the

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- recycling plan at this time as well
5. For assets that will be partially disassembled with a substantial remainder assigned to recycling, i.e. like most airframes, the manifest should be available before disassembly to distinguish what is removed from what remains. For assets that will be completely disassembled, like most engines, the manifest may be created during the disassembly upon the agreement of both the Customer and the Facility.

### Minimum Standards

Procedure that a manifest will be prepared based on contract terms. Contract samples available for review.

**BEST PRACTICE (V)(a) 3** – A disassembly Facility shall have a clear, written understanding of any customer expectations or demands concerning disassembly of the Asset and recovery of the parts removed.

### Practice Guides:

1. The Facility may have a standard boiler-plate agreement explaining its normal practices. Such an agreement should allow the customer to confirm that the customer has no additional demands or requirements.
2. The customer may require more than what is required by the applicable regulations. If so, then these requirements should be captured in writing to assure that all parties have a mutual understanding of the Facility's obligations.
3. Issues that may be addressed in an agreement include:
  - Who has responsibility for recycling costs?
  - Who has responsibility for taxes?
  - Who has continuing ownership for the airframe and/or scrap?
  - Who has continuing liability for the airframe and/or scrap?
  - What are the disassembler's continuing obligations?
  - What are the timeframes and deadlines associated with the disposition of the Asset, its parts and its remainders?
4. The Facility should have an understanding with the customer about who is responsible for crating and shipping the removed parts, and who retains legal responsibility as the shipper of such parts.

### Minimum Standards

Procedure on how customer expectations will be documented and how the documented expectations will be implemented (communicated to people who do the work) with sample contracts

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to review.

**BEST PRACTICE (V)(a) 4** - A disassembly Facility shall have a clear, written understanding of how the Asset is to be discarded following disassembly.

**Practice Guides:**

1. If the Asset belongs to a Customer other than the Facility, then the Facility shall enter into a written agreement with the customer that addresses Asset disposition issues like:
  - Who owns the Asset when the **disassembly** is complete?
  - Is the Facility permitted to recover from the Asset parts that are not listed on the manifest, and if so then who owns such recovered parts?
  - Following **disassembly**, who bears responsibility for disposition of the scrap and the attendant environmental issues (e.g. who is responsible for having the remainder of the Asset recycled, scrapped, or otherwise disposed)?

**Minimum Standards**

Procedure and example of contract for review.

### ***Article V b) – Reference Manuals***

**BEST PRACTICE (V)(b) 1** – A disassembly Facility shall use appropriate methods for removing parts from the Asset, such as those recommended in the manual published by the manufacturer of the Asset, or other guidance that provides adequate protections equivalent to the manufacturer’s manuals.

**Practice Guides:**

1. The Facility removal personnel should have received appropriate and complete training in parts removal processes, and their training and techniques for disassembly of the particular Asset should be current for the model of the Asset being disassembled.
2. Manufacturers may update their manuals. The Facility should ask their customer to provide them with the latest manufacturer’s guidance from their library.
3. Manufacturers produce different configurations of Assets within a single model. Disassemblers should ensure that the guidance that they use to assist in the disassembly is appropriate to the specific configuration of the Asset.

**Minimum Standards**

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Appropriate maintenance manuals are available to workers.

### ***Article V c) – Tagging in a Disassembly Operation***

**BEST PRACTICE (V)(c) 1** – For each part removed from the Asset, the disassembly Facility shall prepare a disassembly identification tag to identify the part. Each tag shall be attached to the part or otherwise associated with it upon the part's removal.

**Practice Guides:**

1. Each tag should include information that uniquely identifies the Asset from which the part was removed, like registry number or (if the Asset had no registry number at the time of disassembly) serial number.
2. Each tag should include information identifying the process like work order number or customer identification. This helps to track the part back to the particular disassembly job.
3. Each tag should include information identifying the part, like part number, serial number, and/or location from which the part was removed. Items without a clear part number must be segregated for further research until their identity can be clearly ascertained.
4. Each tag should include information identifying elements that contribute to the condition of the part, like total times/cycles on the part, and total times/cycles on the Asset from which the part was removed. Such information can often be traced through historical records. The remover should not assign an actual condition description to the part unless he or she is qualified to do so.
5. The facility should identify anything unusual about the part that could affect its airworthiness, like the fact that it has been subject to unusual heat, stress or environmental conditions. This may be identified on the tag, or it may be identified on a written statement that references the asset from which the part has been removed. The Facility may wish to prepare a statement that either identifies the parts as "Subject to an Airworthiness Event," or "Not Subject to an Airworthiness Event."
6. If the facility prepares a "Not Subject to Airworthiness Event"

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statement based on a review of the records collected under BP V(a) 1 (2), then the statement should be limited to the scope of the records reviewed.

7. When preparing this statement, some customers may expect to see a description of the source of the information that served as the basis by which the determination was made.
8. Some customers prefer a statement about the past accident or incident history, rather than the more useful statement focused on unusual heat, stress or environmental conditions. Unless the Facility is confident that it has the complete accident history of the Asset, the Facility should be wary of certifying that the Asset has never been subject to an accident or incident. Such statements should be limited to the scope of the Facility's actual knowledge.

### Minimum Standards

Procedure for identification and completion of ID tag

**BEST PRACTICE (V)(c) 2** – If a disassembly Facility chooses to issue an approval for return to service tag in addition to a disassembly tag then the Facility must confirm that it has appropriate certificated privileges permitting such an approval, and that it uses methods, techniques or practices for accomplishing the inspections that are acceptable to the appropriate government authority.

### Practice Guide:

None

### Minimum Standards

Identify authorizations (if any). If authorizations exist verify approval and procedures. If authorizations don't exist assure that no airworthiness authorization tagging has taken place.

## ***Article V d) – Parts***

**BEST PRACTICE (V)(d) 1** – A disassembly Facility shall maintain a record of each part removed from the Asset.

### Practice Guides:

1. Removed parts should be checked-in against the manifest. The manifest may be used as a check-list for reconciliation of the parts.
2. Removed parts that are not found on the manifest should be processed in accordance with the Agreement between the



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- Facility and the Customer.
3. When the reason for disassembly is known, that reason should be noted in the asset records. For example, the records might note that an engine is being disassembled following an accident, damage, overtemp operation, obsolescence, planned redistribution of parts, etc. Such a record may be valuable in the event further information about the asset is desired by a government agency or a subsequent owner of the parts.

### **Minimum Standards**

Maintain records for review by auditors

**BEST PRACTICE (V)(d) 2** – Following disassembly, the records associated with the Asset shall be returned to the Customer or handled according to the Agreement between the disassembly Facility and the Customer.

### **Practice Guides:**

1. The records belong to the Customer, so this matter is at the option of the Customer.
2. The Facility may continue to store records associated with the disassembled Asset.
3. The records belong to the Asset owner, but where that is not the Facility, the Facility may agree to retain them on behalf of the owner.
4. If the records are held on behalf of the Asset owner, then the period and method of retaining the records should be based on the needs and requirements of the Asset owner, which will often be reflected in a contractual agreement.
5. There are several commercially viable options for assisting the Asset owner with record-keeping. For example, the Facility may store the original records in a storage area for the customer. The Facility may also convert the records to digital/electronic media and supply that to the customer. Record-keeping should conform to applicable regulatory authority requirements.

### **Minimum Standards**

Maintain records verifying transfer of documents

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### **ARTICLE VI – TOOLING**

**BEST PRACTICE (VI) 1** – The Facility shall ensure that it has and uses the appropriate tooling, equipment and / or machinery for the disassembly functions it performs.

**Practice Guide:**

1. The Asset maintenance manual may provide useful guidance to help identify the appropriate tooling.
2. **Disassembly** with improper tooling may damage the parts.
3. Be certain that you know the configuration of the Asset, as the precise Asset model and/or configuration may affect the choice of tooling.
4. Where the Facility uses subcontractors for specialized processes, the Facility should ensure that the subcontractors have and use appropriate tooling.

**Minimum Standards**

Tool maintenance & calibration records

**BEST PRACTICE (VI) 2** – Tooling, equipment and machinery should be maintained, calibrated and tested according to the manufacturer's recommendations, so long as those recommendations are appropriate to the usage at the facility. Where there are no manufacturer's recommendations for maintenance, calibration and testing, or where the manufacturer's recommendations are inappropriate for the Facility, the Facility should develop its own procedures for maintenance, calibration and testing.

**Practice Guide:**

None

**Minimum Standards**

Tool maintenance & calibration records

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### **ARTICLE VII – PARTS AND MATERIALS MANAGEMENT DURING PROCESSING**

#### ***Article VII a) – Screening, Tagging and Staging during Asset Disassembly***

**BEST PRACTICE (VII)(a) 1** – During or following disassembly, removed parts should be prepared for safe storage and/or transportation.

**Practice Guides:**

1. Manufacturer's recommendations for preparing parts for safe storage and/or transportation may be available in the manufacturer's maintenance manuals.
2. When disassembling interiors, the Facility should drain the lavatories and sump them out.
3. ESD-sensitive items should be protected from ESD damage. ESD equipment may require special packaging for ESD protection and for general protection. They should be stored and handled in an environmentally controlled area (ensuring that dust, humidity, and temperature are all controlled to reasonable levels). The Facility may wish to consider adding a desiccant bag to the packaging of ESD-sensitive parts. The Facility should use appropriate cap/plugs for ESD-sensitive equipment.
4. The Facility should be wary of chemical oxygen generators, which may be found in passenger service units, crew Protective Breathing Equipment (PBE), and even in for certain types of seats.
5. The Facility should take steps to deactivate squibs from emergency equipment and engine fire extinguishing systems.
6. Be sure that flaps and other surfaces are in their appropriate positions before removing the Auxiliary Power Unit. When removing flaps and flight control surfaces, the Facility should take steps to prevent them from delaminating.
7. As parts are removed from the Asset, the Facility should consider weight and balance issues. With no fuel, the center of gravity may tend to shift. It may be advisable to add ballast to the Asset.

**Minimum Standards**

Packaging procedure

## **Disassembly Practice Guide and Minimum Standards**

**BEST PRACTICE (VII)(a) 2** – Once a part has entered the segregated staging area, the Facility shall have a written procedure for analyzing it to make sure it meets the Customer’s requirements and to make sure it is on the Customer’s manifest. Parts that do not meet appropriate standards must be returned to the Asset disassembly area or a quarantine area to be held until they are ready to be researched (if the problem can be overcome through research), recycled or otherwise dispositioned.

### **Practice Guides:**

1. The analysis may include verification that the information on the removal tag correlates to the part
2. The analysis may include verification that the part is adequately protected from damage when packed
3. The analysis may include verification that the appropriate caps and plugs adequately protect from leakage of fluids
4. The analysis may include an initial visual inspection of condition for ‘gross’ or obvious condition. Significant data observed (obvious defects or damages, cracks, dents, etc.) should be captured and reported through amendment of the removal tag. The Facility may want to include pictures of the information to demonstrate the current condition. This is not necessarily airworthiness data because the remover may not be qualified to make airworthiness statements

### **Minimum Standards**

Procedure and sample contracts to review. Also must have a procedure for quarantine and product disposition.

**BEST PRACTICE (VII)(a) 3** – The Facility must not determine the airworthiness of parts unless the Facility is properly authorized to do this.

### **Practice Guides:**

1. Determining the airworthiness of parts is usually a function that is regulated by an airworthiness authority, and that requires certification by the airworthiness authority.
2. The Facility may wish to work with a repair station or other qualified service provider to obtain initial functional checks on aircraft systems to determine their state of serviceability.

### **Minimum Standards**

Identify authorizations (if any). If authorizations exist verify approval and procedures. If authorizations don’t exist confirm that it is not the facility’s practice to issue airworthiness authorization tags.

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**BEST PRACTICE (VII)(a) 4** – When identifying parts as unsalvageable, the Facility shall identify the reason for this identification.

### **Practice Guides:**

1. A Facility may identify a part as unsalvageable, based on the Facility's own standards, or on a Customer's standards, or on any standards provided to the Facility that the Facility agrees to adopt. This is a commercial decision rather than an airworthiness decision, however the commercial decision may not be made in a manner contrary to laws, directives or regulations where they apply, nor should the decision be made in a manner that jeopardizes aviation safety.
2. Reasons why a Facility may designate a part as unsalvageable include:
  - the physical condition of the Part makes it uneconomical to return it to an airworthy condition;
  - the physical condition of the Part is beyond the tolerances published in the manufacturer's manuals;
  - the Part is missing key data, like current life status;
  - the Part is known to have reached its life-limit;
  - the Part does not have adequate traceability meeting customer requirements.
3. In some cases, a part that is deemed unsalvageable by one entity may be salvageable by another (for example, if the second entity has lower labor costs, which makes labor-intensive repairs more economical, or if the second entity has government-approved data that permits a repair that might otherwise be outside of the manufacturer's tolerances). Records of the reason for the determination of unsalvagability may permit an otherwise unsalvageable part to be salvaged under the right circumstances.
4. Some jurisdictions may have laws, directives, or regulations that affect the definition of the term "unsalvageable" and/or the effect of defining something as unsalvageable. Such laws, directives, or regulations take precedence over conflicting commercial standards.

### **Minimum Standards**

Procedure (including quarantine procedure) and maintain record of reasons.

## **Disassembly Practice Guide and Minimum Standards**

### ***Article VII b) – Containerization***

**BEST PRACTICE (VII)(b) 1** – The Facility shall ensure that it has appropriate storing and shipping containment and packing materials for the articles or materials that it handles.

**Practice Guides:**

1. Containment devices may include vehicles, pallets, Gaylord containers, etc.
2. Where crates are used, the Facility may have pre-made crates or it may establish appropriate resources to permit it to manufacture crating on an as-needed basis.
3. Different nations have limits on the materials that may be used for packaging (e.g. treatment of woods packaging). The Facility may wish to ensure that crates or other packaging will meet the special import requirements of other nations to which the packages may be sent (as well as domestic requirements).
4. In some cases, the manufacturer may provide packaging recommendations.

**Minimum Standards**

Appropriate inventory of containers for materials being held.

### ***Article VII c) – Shipping***

**BEST PRACTICE (VII)(c) 1** – The agreement with the Customer may specify that the Customer is responsible for shipping or transportation issues, in which case the Customer's procedures, and not the Facility's procedures, shall be used.

**Practice Guide:**

None

**Minimum Standards**

Specified in contract, with sample contracts available for review

**BEST PRACTICE (VII)(c) 2** – The Facility shall ensure that materials it ships or transports are packaged and shipped appropriately in accordance with acceptable standards, including contractual requirements.

**Practice Guide:**

1. Applicable packaging standards may be found in ATA Spec 300 and in applicable dangerous goods regulations.

**Minimum Standards**

Procedure to assure that appropriate packaging standards are followed. Appropriate documentation of compliance with

## **Disassembly Practice Guide and Minimum Standards**

contractual requirements.

**BEST PRACTICE (VII)(c) 3** – The Facility shall have a procedure for assuring its own compliance with dangerous goods regulations.

**Practice Guides:**

1. Some parts removed from Assets are dangerous goods. The transportation of dangerous goods is regulated by many countries.
2. All personnel should be trained in the recognition of dangerous goods. Shipping personnel should be trained in the proper shipping of dangerous goods.

**Minimum Standards**

Procedure to assure that appropriate shipping and packaging standards are followed

**BEST PRACTICE (VII)(c) 4** – The Facility shall have a procedure for assuring its own compliance with import and export regulations.

**Practice Guides:**

1. When the Asset is disassembled in one country and the parts are intended to be shipped to another country, then the shipper will need to consider legal issues like taxes, import requirements, export restrictions, assignation of customs value to parts, etc.
2. When the Materials for Recycling cross international boundaries in order to reach the Facility, the shipper will need to consider legal issues like taxes, import requirements, export restrictions, assignation of customs value to parts, etc. The Facility should ensure that the shipper meets this obligation.
3. When the Facility is informed that parts or material is controlled for export purposes, the Facility should pass this information along to the next party who receives that part or material.

**Minimum Standards**

Procedure for import and export compliance.

## **Disassembly Practice Guide and Minimum Standards**

### **ARTICLE VIII – ENVIRONMENTAL PROTECTION**

**BEST PRACTICE (VIII) 1** – The area and methodology for disassembly should adequately protect the environment from unanticipated releases of fluids and hazardous materials that are used during the processing or that might escape from the Asset during disassembly. This should include a Pre-disassembly Checklist to assure compliance.

**Practice Guides:**

1. The Facility may have an environmentally contained pad with oil/water catching capacity large enough to contain the largest storage vessel of the Asset or Materials for Recycling.
2. The Facility may have an intact, impervious surface with run-off control and containment systems such as booms, pads, etc.
3. The Facility may have a Spill Prevention and Control Plan and the equipment on-hand that is called out in that plan.
4. Establish a Pre-disassembly checklist that addresses, for example, draining lavatory tanks and fluids, completely draining and sumping fuel tanks and residual fuel, oil tank drainage, and hydraulic tanks and lines.

**Minimum Standards**

- Receiving inspection specific to fuels, liquids and lavatories
- Having right equipment to drain Assets or Materials for Recycling.
- Having spill equipment and spill prevention & management plan in place in event of unexpected release

**BEST PRACTICE (VIII) 2** – If the Asset or the Materials contain fluids then the fluids must be drained, managed and disposed of according to local jurisdictional requirements.

**Practice Guide:**

1. Fluids may need to be drained from the Asset or Material for Recycling. For example, if the Asset or Material for Recycling is a complete jet engine then it will often contain residual fuel. Often, this is the first step in the disassembly and/or recycling process.
2. Removing the fuel from the Asset or Material for Recycling may need to be done in a segregated area. The potential for static discharge or other source of sparks or combustion should be controlled.



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3. Environmental concerns should be addressed through appropriate control technologies with sufficient capacity to handle largest liquid storage tank/system on Asset or Material for Recycling, for example:
  - Ground surface fully protected
  - Storm-water run-off pathways physically protected with spill barrier equipment (i.e., drains, culverts, channels, etc.)
  - Pumping and storage capacity immediately accessible
  - Oil/water separator
  - Wastewater treatment with aircraft fluid capabilities
  - Spill kits with sufficient absorptive materials
4. Fluids should be identified and segregated to minimize unwanted contamination during the recycling process.

### Minimum Standards

- Procedure for drainage, management, segregation, and disposal
- Equipment for drainage, management, segregation, and disposal

**BEST PRACTICE (VIII) 3** – The disassembly facility shall have a procedure for evaluating and selecting a recycling Facility that can adequately meet the Facility’s recycling goals.

### Practice Guides:

1. Using a recycler who is able to separate materials (e.g. superalloys, titanium, carbon fiber, etc.) in a fine enough grade so that they can be returned as feed stock in primary manufacturing may increase recovery value
2. The Facility should seek to optimize recyclability of the asset to the extent that it helps to generate optimal value for the recycling operation.

### Minimum Standards

Procedure for evaluating and selecting a recycling Facility that can adequately meet the Facility’s recycling goals.

**BEST PRACTICE (VIII) 4** – The disassembly facility shall coordinate with the recycler to ensure that parts intended for recycling are processed in a manner that supports the recycling goals of the Facility.

### Practice Guides:

1. The Facility should work with the recycler to identify potential candidate components for recycling.
2. The recycler may ask the Facility to take steps to preserve

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- or prepare the remainders of the Asset for recycling. These steps should be coordinated with the recycler.
3. Material that is destined for recycling should be kept in a condition appropriate to the recycling process. The Facility should consider protective measures like security (adequate to prevent loss) and reasonable protection from corrosion. These measures should be weighed against factors like the needs of the Facility, the needs of the recycler, and the actual local environmental conditions.
  4. In some cases, the disassembly strategy may be focused on recovering the materials within the asset, rather than on recovering actual parts.
  5. When using plasma torches to cut scrap, the Facility should be aware that the heat can contaminate some alloys, reducing their reclamation value.

### **Minimum Standards**

Procedure that the disassembly facility shall coordinate with the recycler to ensure that parts intended for recycling are processed in a manner that supports the recycling goals of the Facility

**BEST PRACTICE (VIII) 5** – The disassembly facility shall have a procedure for verifying that the recycling facility fully implements the recycling agreement between the recycling facility and the disassembly facility and/or Customer.

### **Practice Guides:**

1. The Facility may wish to bind the recycler to a contractual obligation to assure that the recyclable material is handled pursuant to the Facility's expectations
2. The Facility may wish to audit the recycler to assure that the recyclable material is handled pursuant to the Facility's expectations
3. The Facility may ask the recycler to provide a written confirmation of the disposition of the recyclable material
4. The Facility may ask the recycler to meet one or more of the following standards:
  - All items to be destroyed beyond reconstruction to its original form and intended use;
  - All items to be destroyed beyond the ability to be reverse engineered;
  - Larger parts to be broken into small sections;
  - Parts smaller than 4" to be destroyed beyond recognition.

### **Minimum Standards**

Procedure for performing contractor audits.

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### **ARTICLE IX – ACCOUNTABILITY TO THE CUSTOMER**

**BEST PRACTICE (IX) 1** – Where verification is required by the Customer, supplier or source, the Facility shall have a procedure for verifying to each Customer or supplier of Materials, or each Asset owner or source, that the Facility fully implements each element of the agreement between the Facility and the Customer, supplier or source.

**Practice Guides:**

1. The Customer, supplier, source, or owner may wish to bind the Facility to a contractual obligation to assure that the Asset or Material is handled pursuant to the Customer, supplier, source, or owner's expectations
2. The Customer, supplier, source, or owner may wish to audit the Facility to assure that the Asset or Material is handled pursuant to the Customer, supplier, source, or owner's expectations
3. The Customer, supplier, source, or owner may ask the Facility to provide a written confirmation of the disposition of the Asset or Material. The Facility should consider providing such written verification.
4. The Customer or supplier may ask the Facility to meet one or more of the following standards:
  - All items to be destroyed beyond reconstruction to their original form and intended use;
  - All items to be destroyed beyond the ability to be reverse engineered;
  - If present, dataplates shall be destroyed or returned
5. Supplier requirements that affect value of recycled materials may affect Facility pricing.

**Minimum Standards**

Procedure for complying with Customer, supplier, source or owner agreements.

### **ARTICLE X – SCRAPPING**

**BEST PRACTICE (X) 1** – Where aircraft parts are specifically identified by the Facility or the Customer to be precluded from re-entry into the civil aviation marketplace, the facility shall have procedures to address the handling of such parts.

**Practice Guides:**

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1. The procedures should address the mutilation process, documenting and recording methods, and interactions or notifications as may be required by customers and/or contracts.
2. The procedure may make reference to a model that is followed based upon a regulation, guidance or industry standard such as the Aviation Suppliers Association Best Practice for Unsalvageable Material.

### **Minimum Standards**

A procedure for implementing supplier or customer contractual minimum requirements for destruction to preclude affected parts from return to service.

**BEST PRACTICE (X) 2** – The parts shall be precluded from re-entry into the civil aviation marketplace by rendering those parts unusable for their original intent.

### **Practice Guides:**

1. Mutilation of parts or Materials should occur within a reasonable period after delivery.
2. When items are destroyed, destruction should be witnessed by a responsible person other than the operator of the mutilation equipment and the schedule of destroyed items should be certified as destroyed by the witness.
3. Remnants of the destroyed items should be disposed-of properly to preclude their rework back into apparently-viable parts – this *may* also be subject to the witness' certification. Those remnants may be reclaimed through the recycling process.
4. Identification items (i.e. data plates) should be removed.

### **Minimum Standards**

Procedure for ensuring parts are rendered unusable.

**BEST PRACTICE (X) 3** – Until such time that the identified parts are rendered unusable, the identified parts shall be segregated from other parts.

### **Practice Guides:**

1. The intent of this is to ensure these parts or material are not mistakenly taken to be processed for other purposes. Acceptable means of segregation could include Quarantine cages, Bond Rooms, conspicuous signage and/or tagging, or dedicated boxes, containers, or shelving conspicuously labeled or marked.

### **Minimum Standards**

Quarantine or segregation procedures.

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**BEST PRACTICE (X) 4** – For parts that have already been tagged (per Article V (c)), and/or are on the Manifest, the facility shall have a procedure and methods for accountability regarding the records created to list and attest that the identified parts have been rendered unusable. If the actions to render the parts unusable have been contracted to an outside contractor, the procedure shall include the methods used for accountability and recording the rendering actions.

### **Practice Guides:**

1. When items are destroyed, destruction should be witnessed by a responsible person other than the operator of the mutilation equipment and the schedule of destroyed items should be certified as destroyed by the witness.
2. It is normal to provide the customer with a signed certification from the witness that the lot, part, or article has been destroyed. Generally speaking the signed certificate references a batch rather than listing individual parts unless the customer otherwise requests.
3. Any record required to be produced or maintained under this standard shall be retained by the Facility for not less than two (2) years. This requirement does not supersede legal obligations that may require longer retention times.
4. Material anticipated for destruction should be identified in a parts disposal schedule like the written Agreement between the Facility and the Customer or an appendix to the manifest.
5. The parts disposal schedule should be reviewed and approved by the owner of the Asset.
6. The owner of the Asset or Materials for Recycling should review the final list of parts to be scrapped (the parts disposal schedule, as amended) and should authorize the parts for destruction in writing.
7. Destruction of the parts listed in the parts disposal schedule should occur within a reasonable period after authorization.
8. Provide notification to customer and any interested agency with jurisdiction that the Asset has been destroyed and the degree to which that the Asset has been recycled.

### **Minimum Standards**

Written procedures.

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### ARTICLE XI – KPIs

**BEST PRACTICE (XI) 1** – A facility which voluntarily chooses to employ Key Performance Indicators, and to receive AFRA recognition of the same, shall implement one of four levels of KPIs; Bronze, Silver, Gold, or Diamond.

**Practice Guides:**

The four levels consist of the following KPIs:

<b>BRONZE</b>	<b>SILVER</b>	<b>GOLD</b>	<b>DIAMOND*</b>
<b>KPI MEASUREMENTS:</b>			
<ul style="list-style-type: none"> <li>• Number of parts reused.</li> <li>• Recyclability rate.</li> </ul>	<ul style="list-style-type: none"> <li>• Number of parts reused.</li> <li>• Recyclability rate.</li> <li>• Total Waste.</li> <li>• Total hazardous waste</li> <li>• Core disposal rate</li> </ul>	<ul style="list-style-type: none"> <li>• Number of parts reused.</li> <li>• Recyclability rate.</li> <li>• Total Waste.</li> <li>• Total hazardous waste.</li> <li>• Core disposal rate.</li> <li>• Reusability rate.</li> </ul>	<ul style="list-style-type: none"> <li>• Number of parts reused.</li> <li>• Recyclability rate.</li> <li>• Total Waste.</li> <li>• Total hazardous waste.</li> <li>• Core disposal rate.</li> <li>• Reusability rate.</li> <li>• Energy recoverability rate.</li> </ul>

\* In order to achieve the Diamond Level, individual KPI Data must be clearly derived from, and attributable to a serialized asset; for example, an aircraft MSN, Engine Serial Number, or APU Serial Number.

1. Number of parts reused, the formula:

$$\text{Number of parts reused} = \text{Total Number of parts intended to be returned to the market}^A$$

A: May consist of:

- Parts intended to be sold as AR
- Parts already tagged (i.e. Inspected)
- Parts already or intended to be sent to a repair station/AMO to be overhauled, repaired etc.
- Combination of all the above

2. Recyclability rate, the formula:

$$\frac{\text{Total Recycled mass output}^B}{\text{Input mass}^C} \times 100$$

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B: Consisting of all materials that were recycled (see definitions in the BMP of Recycled Material, and Recycling).

C: May consist of the totals of the mass sent to or received by the recycling facility. Alternatively, the published empty weight of the aircraft may be used.

3. Total waste, the formula:

$$\text{Total Mass of material sent to the landfill}^D$$

D: This is the mass of material which was not recycled and subsequently sent to a landfill.

4. Total hazardous waste, the formula:

$$\text{Total Mass of Hazardous waste}^E$$

E: May consist of waste oil, fuel, hydraulic fluid, and lavatory waste.

5. Core disposal rate, the formula expressed as a percentage:

$$\frac{\text{Total mass of material sent to the landfill}^F}{\text{Input mass}^G}$$

F: This is the mass of material which was not recycled and subsequently sent to a landfill.

G: May consist of the totals of the mass sent to or received by the recycling facility. Alternatively, the published empty weight of the aircraft may be used.

6. Reusability rate, the formula expressed as a percentage:

$$\frac{\text{Number of parts reused}^H}{\text{Input number of parts}^I}$$

H: May consist of:

- Parts intended to be sold as AR
- Parts already tagged (i.e. Inspected)
- Parts already or intended to be sent to a repair station/AMO to be overhauled, repaired etc.
- Combination of all the above

I: May consist of the total number of possible rotables gleaned from the IPC/IPL or similar

7. Energy recoverability rate, the formula expressed as a percentage

$$\frac{\text{Mass of materials to be used for energy recovery}^J}{\text{Input mass}}$$

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### Input mass<sup>K</sup>

J: Consists of waste oil, hydraulic fluid, or fuel which can be submitted with the intent to have it recovered as an energy producing product.

K: May consist of the totals of the mass sent to or received by the recycling facility. Alternatively, the published empty weight of the aircraft may be used.

#### 8. Exclusions:

- A facility may cite an exclusion if the KPI involves data it does not have access to. For example, if Bronze is chosen, and if the facility is accredited to Disassembly only (it is not accredited for Recycling), it may cite an exclusion to the Recyclability Rate KPI.
- Conversely, if the facility is accredited to Recycling only, it may cite an exclusion to the Number of Parts Reused KPI.
- Facilities accredited to both Disassembly and Recycling regardless of whether it is contracted or not, shall implement all the KPIs applicable to the chosen level.
- Facilities which claim publicly (in advertising for example) that they achieve certain levels of, for example, reuse or recycling, and the claimed data could reasonably be derived from one of the KPIs, then an exclusion cannot be listed.

#### Minimum Standards:

- The Facility Chooses one of the levels.
- Written procedures for the chosen level incorporating the noted formulas.
- All formulas are accounted for including exclusions

**BEST PRACTICE (XI) 2** – All KPIs shall be measured every two years, or more frequently if desired. For the Diamond level, rather than every two years, the KPI data must be attributable to each asset by aircraft MSN or asset serial number.

#### Practice Guides

1. The maximum period for collection and documenting of the KPI shall not exceed 2 years.
2. Based on frequency of the available data or the automation of the process, the facility may choose to document the resulting KPI more frequently than every two years.



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3. For the Diamond Level, each KPI data result must be attributable to the asset's MSN or serial number. For example, for the formula 'Number of Parts Reused', an acceptable form of KPI expression-result would be 'For aircraft MSN 45678, the Number of Parts Reused was...'

**Minimum Standards:**

Written procedure.