OTAR Considerations Related to Aircraft Parts

Reference - Overseas Territories Aviation Circular OTAC 145-12 21-5 & OTAR Part 145.59

Introduction

Misrepresented or unapproved scrap parts and materials that have been fitted to aircraft or included in aircraft components is a significant problem worldwide and has been the cause of several incidents and accidents. This Circular provides information and guidance on the requirements for the reporting of unapproved parts, guidelines for the proper usage of parts removed from aircraft and guidelines for the disposal of scrapped parts to assist in preventing their subsequent unapproved use in aircraft.

Identification and reporting of misrepresented / unapproved parts

Misrepresented/unapproved scrap parts and materials should not be received into an active stores inventory. The following are examples of conditions to be alert for when receiving parts:

(a) Parts showing signs of rework which were purchased as ‘new’;
(b) Used parts showing signs of unapproved or inappropriate repair;
(c) Parts with poor workmanship;
(d) Parts with signs of rework in the area of the part data plate, part number or serial number;
(e) Used parts lacking verifiable documentation of history and approval;
(f) Parts with prices that are ‘too good to be true’;
(g) Questionable part numbers, fraudulent or suspicious TSO, ETSO or FAA PMA markings and/or re-identification, stamp-overs or vibro-etching on the data plate;
(h) Parts delivered with photocopied or missing release certificates (ref OTAR Part 21 Subpart K);
(i) Parts with a finish that is inconsistent with industry standards (e.g. discolouration, inconsistencies, resurfacing);
(j) Parts purchased as new but with release documentation reflecting a status other than new;
(k) Parts with poor documentation exhibiting incomplete or inconsistent part identity information;
(l) Intact ‘scrap’ unsalvageable parts offered in bulk weight for prices higher than for mutilated parts with identical weight and content.

Notification of misrepresented/unapproved parts

Users of aircraft parts and material are reminded that suspected misrepresented/unapproved parts should be reported to the respective OTAA or ASSI, as applicable, through the Mandatory Occurrence Reporting Scheme as defined in OTAR Part 13.

To assist in tracing misrepresented/unapproved parts and materials, persons raising an MOR should as far as possible provide the following information on their report:

(a) The name of the suspected unapproved part;
(b) Part number, or any other number on the part;
(c) Serial number;
(d) List the next higher assembly that the suspected unapproved part is assembled into and list the part number, if known;
(e) Quantity of suspected unapproved parts found or identified;
(f) Make and model number of the aircraft or component that the suspected unapproved part is applicable to;
(g) The identification of the commercial source of the suspected unapproved part. If the part is identified with the Part Manufacturer or Distributor marking this should be quoted;
(h) Describe any pertinent facts relating to the suspected unapproved part and identify
where the part may be inspected (provide photos, invoices etc if available);
(i) The date the suspected unapproved part was discovered;
(j) Name and address in full or the location where suspected unapproved part(s) was discovered.

Certification of component maintenance

Maintenance of components. Subject to OTAA approval, an approved maintenance organisation may carry out maintenance on an aircraft component (including engines and/or Auxiliary Power Units (APUs), in accordance with aircraft maintenance data or in accordance with component maintenance data when meeting the following conditions:

(a) all necessary facilities, equipment, tooling, material, maintenance data and certifying staff are available in accordance with 145.11(6).
(b) The maintenance activity is within the Organisation’s scope of work as approved in the MOE.
(c) an OTAR Part 43.105 certificate of release to service for such maintenance is made, stating:
(i) What maintenance has been completed and the reference of the data used and its revision status.
(ii) What airworthiness directives, repairs and modifications have been incorporated.
(iii) Details of life used for any service life-limited parts changed, being any combination of fatigue, overhaul or storage life.
(iv) For any aircraft component having its own maintenance history record, the record is updated, and reference made to it in the aircraft maintenance record.
(v) If it is not possible to establish satisfactory compliance with all applicable conditions specified in this paragraph, the aircraft component should be removed from the aircraft and inspected by an appropriately component rated organisation for issue of an acceptable release to service in accordance with OTAR 21 Subpart K.

Components removed from a serviceable aircraft.

Serviceable aircraft parts removed from a serviceable aircraft may be issued with a OTAR Part 43.105 release to service for fitting to another aircraft subject to the compliance with the following:

(a) The donor and recipient aircraft must be on the Overseas Territories register.
(b) The donor aircraft must be in an airworthy condition or in a controlled maintenance environment undergoing a scheduled maintenance check.
(c) The aircraft must have a valid certificate of airworthiness.
(d) The organisation should ensure that an appropriately qualified person removed the part from the aircraft using approved data.
(e) The part may only be considered eligible if the last flight operation with the part fitted revealed no faults on that part or related system.
(f) The part should be inspected for satisfactory condition including, damage, corrosion or leakage and compliance with any additional manufacturer's maintenance instructions and the requirements of the aircraft's maintenance programme.
(g) The aircraft records should be reviewed for any unusual events that could affect the serviceability of the part such as involvement in accidents, incidents, heavy landings or lightning strikes. A release to service should not be issued if it is suspected that the part has been subjected to extremes of stress, temperature or immersion, which could affect its operation.
(h) A maintenance history record to include flight hours/cycles/landings as applicable should be available for all used serialised and life limited parts including details of scheduled maintenance requirements derived from the donor aircraft maintenance programme and maintenance planning schedule.
(i) Compliance shall be established with any continued airworthiness instructions for applicable modifications (changes) and repairs for the component by incorporating the continued airworthiness requirements into the recipient's aircraft maintenance programme and maintenance planning schedule.
(j) The flight hours/cycles/landings as applicable of any service life limited parts including time since overhaul should be established and the details of service life remaining should be transferred to the recipient aircraft records.
(k) Compliance with known applicable Airworthiness Directives should be established and maintained particularly where non-terminating action had previously been taken.
(l) A modification status review shall be undertaken of the recipient aircraft and component/part to ensure eligibility for fitment.
(m) Consideration shall be given to undertaking a component/system functionality test.

Used aircraft components removed from an aircraft withdrawn from service.

Serviceable aircraft components removed from a Territory registered aircraft withdrawn from service may be issued a OTAR 43.105 certificate of release to service by a maintenance organisation approved under OTAR 145 subject to compliance with this subparagraph.

(a) Aircraft withdrawn from service are sometimes dismantled for spares. This is to be considered a maintenance activity and should be accomplished under the control of an organisation approved under OTAR 145, employing procedures approved by their authority.

(b) To be eligible for installation, components removed from such aircraft may be issued with an OTAR 43.105 certificate of release to service by following a satisfactory assessment to ensure that:

(i) as a minimum, the component satisfies the standards set out in paragraph 4.2 as appropriate. This should, where known, include the possible need for the alignment of scheduled maintenance that may be necessary to comply with the maintenance programme applicable to the aircraft on which the component is to be installed.

(ii) irrespective of whether the aircraft holds a certificate of airworthiness or not, the organisation responsible for certifying any removed component should satisfy itself that the manner in which the components were removed and stored are compatible with the standards required by OTAR 145.

(iii) a structured plan should be formulated to control the aircraft disassembly process. The disassembly is to be carried out by an appropriately type rated organisation under the supervision of certifying staff, who will ensure that the aircraft components are removed and documented in a structured manner in accordance with the appropriate maintenance data and disassembly plan.

(iv) all recorded aircraft defects should be reviewed and the possible effects these may have on both normal and standby functions of removed components are to be considered.

(v) dedicated control documentation is to be used as detailed by the disassembly plan, to facilitate the recording of all maintenance actions and component removals performed during the disassembly process. Components found to be unserviceable are to be identified as such and quarantined pending a decision on the actions to be taken. Records of the maintenance accomplished to establish serviceability are to form part of the component maintenance history.

(vi) suitable OTAR 145 facilities for the removal and storage of removed components are to be used which include suitable environmental conditions, lighting, access equipment, aircraft tooling and storage facilities for the work to be undertaken. While it may be acceptable for components to be removed, given local environmental conditions, without the benefit of an enclosed facility subsequent disassembly (if
required) and storage of the components should be in accordance with the manufacturer’s recommendations.

(vii) for used aircraft components removed from an aircraft involved in an accident or incident, such components should only be issued with an OTAR 43.105 release to service when processed in accordance with paragraph 4.2 and a specific work order including all additional necessary tests and inspections made necessary by the accident or incident. Such a work order may require input from the TC holder or original manufacturer as appropriate.

Disposal of scrap aircraft parts and materials

Disposed scrap parts and materials may, in some instances, reappear for sale in the serviceable parts inventories within the aviation community.

Such misrepresentation of the status of parts and material and the practice of making these items appear serviceable could result in the use of non-conforming parts and material. The owner's/operator's permission should be sought prior to the disposal of scrap parts and materials.

Caution should therefore be exercised to ensure that the following types of parts and materials are disposed of in a controlled manner that does not allow them to be returned to service:

(a) parts with non-repairable defects;
(b) parts that are outside the specifications set by the approved design and cannot be brought into conformance with the applicable specifications;
(c) parts and materials where further processing or rework cannot make them eligible for certification;
(d) parts subjected to rework or unacceptable modification that is irreversible;
(e) life-limited parts that have reached or exceeded their life limits or have missing or incomplete records
(f) principal Structural Elements removed from a high-cycle aircraft for which conformity cannot be accomplished by complying with the mandatory requirements applicable to ageing aircraft.

Persons disposing of scrap parts and material should, when appropriate, mutilate those parts and materials prior to disposal. Mutilation should be such that the parts and materials become unusable for their original intended use. It should also not be possible for them to be reworked or camouflaged to provide the appearance of being serviceable for example by re-plating, shortening and re-threading long bolts, welding, straightening, machining, cleaning, polishing or repainting.

Multilation may be accomplished by one or a combination of the following procedures, but not limited to:
(a) grinding;
(b) burning;
(c) removal of a major lug or other integral feature;
(d) permanent distortion of parts;
(e) cutting a hole with cutting torch or saw;
(f) melting;
(g) sawing into many small pieces.

The following are examples of mutilation that are often less successful since they may not be consistently effective:

(a) stamping (such as a stamped 'R' on the part);
(b) spraying with paint;

(c) hammer marks;
(d) identification by tag or markings;
(e) drilling small holes;
(f) sawing in two pieces since it may be possible to attempt to restore parts cut in two pieces in such a manner that the mutilation proves difficult to detect.

For the disposal of scrap aircraft parts and materials for legitimate non-flight uses, such as training and education, research and development, or non-aviation applications mutilation is not appropriate and the following methods should be used to prevent misrepresentation:

(a) permanently marking or stamping the parts, subparts and material as 'NOT SERVICEABLE'. Ink stamping is not an acceptable method;
(b) removing original part number identification;
(c) removing the data plate;
(d) maintaining a tracking system, by serial number or other individualised data, to record transferred scrap aircraft parts and material, and
(e) include written instructions concerning disposition and disposal of such parts and materials in any agreement or contract transferring the parts and materials.

Fabrication of Parts

An approved maintenance organisation may fabricate a restricted range of parts when agreed by their Territory authority through the following guidelines:

(a) Fabrication, inspection, assembly and test should be clearly within the technical and procedural capability of the approved maintenance organisation.
(b) The approved data necessary to fabricate the part are those approved or accepted by an agency as stated in OTAR Part 21.25, e.g. the TC holder, EASA Part-21 design organisation approval holder, or STC holder.
(c) Items fabricated by an approved maintenance organisation may only be used by that organisation in the course of overhaul, maintenance, modifications, or repair of aircraft or components undergoing work within its own facility. The permission to fabricate does not constitute approval for manufacture, or to supply externally for onward supply and/or sale.
(d) The approved or accepted data specified may include repair procedures involving the fabrication of parts. Where the data on such parts is sufficient to facilitate fabrication, the parts may be fabricated by an approved maintenance organisation. Care should be taken to ensure that the data include details of part numbering, dimensions, materials, processes, and any special manufacturing techniques, special raw material specification or/and incoming inspection requirement and that the approved organisation has the necessary capability.

That capability should be defined by way of maintenance organisation manual content. Where special processes or inspection procedures are defined in the approved data which are not available at the approved maintenance organisation, that organisation cannot fabricate the part unless the TC/STC holder gives an approved alternative.

(e) Examples of fabrication under the scope of an OTAR Part 145 Approval can include but are not limited to the following:
(a) fabrication of bushes, sleeves and shims,
(b) fabrication of secondary structural elements and skin panels,
(c) fabrication of control cables,
(d) fabrication of flexible and rigid pipes,
(e) fabrication of electrical cable looms and assemblies,
(f) formed or machined sheet metal panels for repairs.
(f) It is not acceptable to fabricate any item to pattern unless engineering information or drawing of the item is available or produced, which includes all necessary fabrication processes, and which is shown to be approved or accepted data.
(g) Any locally fabricated part should be subject to an inspection stage before, separately, and preferably independently from, any inspection of its installation.

The inspection should establish full compliance with the relevant manufacturing data, and the part should be unambiguously identified as fit for use by stating conformity to the approved data. Adequate records should be maintained of all such fabrication processes including heat treatment and the final inspections.

All parts, excepting those with inadequate space, should carry a part number which clearly relates it to the manufacturing/inspection data. Additional to the part number the approved maintenance organisation’s identity should be marked on the part for traceability purposes.