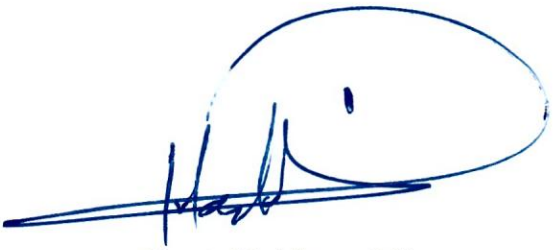
Acceptable Means of Compliance to Part-145

AMC to JCAR Part - 145

June 2025



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Chief Commissioner/CEO

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AMC1 145.10 Scope

LINE MAINTENANCE AND BASE MAINTENANCE

(a) 'Line maintenance' refers to limited maintenance for the aircraft suitable to be carried out whilst the aircraft remains in the air operation environment.

Line maintenance may include:

- trouble shooting;
- defect rectification;
- component replacement with use of external test equipment if required. Component replacement may include components such as engines and propellers;
- maintenance that will detect obvious unsatisfactory conditions/discrepancies/malfunctions but does not require extensive in-depth inspection. It may also include internal structure, systems and powerplant items which are visible through quick opening access panels/doors/ports;
- repairs, modifications and other maintenance tasks which do not require extensive disassembly and can be accomplished by simple means.

(b) 'Base maintenance' refers to any maintenance for the aircraft other than line maintenance.

(c) Organizations maintaining aircraft should have a procedure to determine whether the tasks or groups of tasks to be carried out fall under the line maintenance or base maintenance scope of the organization, with due regard to the expected duration of the maintenance, number and type of tasks, shifts and disciplines involved, work environment, etc.

For temporary or occasional cases, the organization may also have a procedure which allows, subject to a task assessment (including all relevant aspects and conditions), to conduct a base maintenance task under line maintenance environment.

(d) In particular, maintenance tasks of aircraft subject to 'progressive' or 'equalized' maintenance programs should be individually assessed in respect of such procedure to ensure that all the tasks within the particular check can be carried out safely and to the required standards at the designated line maintenance station.

GM1 145.10 Scope

SMALL ORGANISATIONS

This Guidance Material (GM) provides guidance on how the following small organizations satisfy the intent of Part-145:

(a) Organizations that only employ one person, who carries out the certification function and other functions, and that are approved under Part-145 may use the alternatives provided below limited to the following terms of approval:

- **Class A2** Base and line maintenance of aeroplanes of 5 700 kg maximum take-off mass (MTOM) or less (with piston engines only)
- **Class A3** Base and line maintenance of single-engined helicopters of 3 175 kg MTOM or less
- **Class A4** Aircraft other than A1, A2 and A3 aircraft
- **Class B2** Piston engines with maximum output of less than 450 HP
- **Class C** Components
- **Class D1** Non-destructive testing

145.30(b): The minimum requirement is for one full-time person who meets the Part-66 requirements for certifying staff and holds the position of 'accountable manager, safety manager, maintenance engineer and is also certifying staff and, if applicable, airworthiness review staff'. No other person may issue a certificate of release to service and therefore if that person is absent, no maintenance may be released during such absence.

(1) The independent audit element of the compliance monitoring function of point 145.200(a)(6) may be subcontracted to an appropriate organization approved under Part-145 or contracted to a person with appropriate technical knowledge and extensive experience of audits, working under the management system of the organization, with the agreement of CARC.

Note: 'Full-time' for the purpose of Part-145 means not less than 35 hrs per week except during vacation periods.

(2) 145.35. In the case of an approval based on one person using an independent audit monitoring arrangement as referred to in point (1), the requirement for a record of certifying staff is satisfied by the submission to and acceptance by CARC of the MOE. With only one person, the requirement for a separate record of authorization is unnecessary because CARC Form 18 OF-0127 certificate defines the authorization. An appropriate statement, to reflect this situation, should be included in the exposition.

(3) 145.200(a)(6). It is the responsibility of the organization or person referred to in point (1) to make a minimum of two on-site audits every year, and it is the responsibility of this organization or person to carry out these activities on the basis of one pre-announced visit and one unannounced visit to the maintenance organization.

It is the responsibility of the Part-145 organization to ensure that effective implementation of all corrective actions takes place.

(b) Recommended operating procedure for a Part-145 organization based upon up to 10 persons involved in maintenance.

(1) 145.30(b) and 145.30(c): The normal minimum requirement is for the employment on a full-time basis of two persons who meet the applicable requirements for certifying staff, whereby one holds the position of 'maintenance engineer' and the other holds the position of 'compliance monitoring engineer'.

Either person can assume the responsibilities of the accountable manager and safety manager provided that they can comply in full with the applicable elements of points 145.30(a) and 145.30(ca), but the 'maintenance engineer' is the certifying person in order to retain the independence of the 'compliance monitoring engineer' to carry out audits. Nothing prevents either engineer from undertaking maintenance tasks provided that the 'maintenance engineer' issues the certificate of release to service. This 'maintenance engineer' may also be nominated as airworthiness review staff to carry out airworthiness reviews and to issue the corresponding recommendation for airworthiness review certificate for aircraft for which Part M applies.

The 'compliance monitoring engineer' should have similar qualifications and status to the 'maintenance engineer' for reasons of credibility, unless he/she has a proven track record in aircraft compliance monitoring, in which case some reduction in the extent of his or her maintenance qualifications may be permitted.

In cases where CARC agrees that it is not practical for the organization to nominate a person responsible for the independent audit of the compliance monitoring function, this element may be arranged in accordance with point (a)(1).

AMC1 145.15 Application for an organization certificate

An application should be made In a form and in a manner established by CARC means that the application should be made on a CARC Form 18 OF-0148 (refer to Appendix III to AMC1 to Part-145.15).

AMC2 145.15 Application for an organization certificate

GENERAL

(a) Draft documents should be submitted at the earliest opportunity so that the assessment of the application can begin. The initial certification or approval of changes cannot take place until CARC has received the completed documents.

(b) This information, including the results of the pre-audit specified in point 145.15(b)(1), will enable CARC to conduct its assessment in order to determine the volume of certification and oversight work that is necessary, and the locations where it will be carried out.

(c) The intent of the internal pre-audit referred to in point 145.15(b)(1) is to ensure that the organization has internally verified its compliance with the Regulation. This should allow the organization to demonstrate to CARC the extent to which the applicable requirements are complied with, and to provide assurance that the

organization management system (including compliance monitoring system) is established to a level that is sufficient to perform maintenance activities.

AMC1 145.20 Terms of approval and scope of work

The following table identifies the ATA Specification 2200 chapter for the category C component rating. If the maintenance manual (or equivalent document) does not follow the ATA Chapters, the corresponding subjects still apply to the applicable C rating.

CLASS	RATING	ATA CHAPTERS
COMPONENTS OTHER THAN COMPLETE ENGINES OR APUs	C1 Air Cond & Press	21
	C2 Auto Flight	22
	C3 Comms and Nav	23 - 34
	C4 Doors - Hatches	52
	C5 Electrical Power & Lights	24 – 33 - 85
	C6 Equipment	25 - 38 - 44 – 45 - 50
	C7 Engine – APU	49 - 71 - 72 - 73 - 74 - 75 - 76 - 77 - 78 - 79 - 80 - 81 - 82 - 83
	C8 Flight Controls	27 - 55 - 57.40 - 57.50 -57.60 - 57.70
	C9 Fuel	28 - 47
	C10 Helicopters - Rotors	62 - 64 - 66 - 67
	C11 Helicopter - Trans	63 - 65
	C12 Hydraulic Power	29
	C13 Indicating/Recording Systems	31 – 42 - 46
	C14 Landing Gear	32
	C15 Oxygen	35
	C16 Propellers	61
	C17 Pneumatic & Vacuum	36 - 37
	C18 Protection ice/rain/fire	26 - 30
	C19 Windows	56
	C20 Structural	53 - 54 - 57.10 - 57.20 - 57.30
	C21 Water Ballast	41
	C22 Propulsion Augmentation	84

AMC2 145.20 Terms of approval and scope of work

Facilities such as stores, line stations, component or subcontractors workshops that are not located together with the main facilities of the organization may be covered by the organization approval without being identified on

the organization certificate, provided that the MOE identifies these facilities and contains procedures to control such facilities, and CARC is satisfied that they form an integral part of the approved maintenance organization.

AMC1 145.25(a) Facility requirements

1. Where the hangar is not owned by the organization, it may be necessary to establish proof of tenancy. In addition, sufficiency of hangar space to carry out planned base maintenance should be demonstrated by the preparation of a projected aircraft hangar visit plan relative to the intended maintenance activities. The aircraft hangar visit plan should be updated on a regular basis.

2. Protection from the weather elements relates to the normal prevailing local weather elements that are expected throughout any twelve-month period. Aircraft hangar and component workshop structures should prevent the ingress of rain, hail, ice, snow, wind and dust etc. Aircraft hangar and component workshop floors should be sealed to minimize dust generation.

3. For line maintenance of aircraft, hangars are not essential, but it is recommended that access to hangar accommodation be demonstrated for usage during inclement weather for minor scheduled work and lengthy defect rectification.

4. Subject to a risk assessment and agreement by CARC, the organization may use facilities at the approved location other than a base maintenance hangar for certain aircraft base maintenance tasks, provided that those facilities offer levels of weather and environmental protection that are equivalent to those of a base maintenance hangar, as well as a suitable working environment for the particular work package. This does not exempt an organization from the requirement to have a base maintenance hangar in order to be approved to conduct base maintenance at a given location.

AMC 145.25(b) Facility requirements

It is acceptable to combine any or all of the office accommodation requirements into one office subject to the staff having sufficient room to carry out the assigned tasks.

In addition, as part of the office accommodation, aircraft maintenance staff should be provided with an area where they may study maintenance instructions and complete maintenance records in a proper manner.

AMC 145.25(d) Facility requirements

1. Storage facilities for serviceable aircraft components should be clean, well-ventilated and maintained at a constant dry temperature to minimize the effects of condensation. Manufacturer's storage recommendations should be followed for those aircraft components identified in such published recommendations.

2. Storage racks should be strong enough to hold aircraft components and provide sufficient support for large aircraft components such that the component is not distorted during storage.

3. All aircraft components, wherever practicable, should remain packaged in protective material to minimize damage and corrosion during storage.

AMC1 145.30(a) Personnel requirements

ACCOUNTABLE MANAGER

Accountable manager is normally intended to mean the chief executive officer of the approved maintenance organization, who by virtue of his or her position has overall (including in particular financial) responsibility for running the organization. The accountable manager may be the accountable manager for more than one organization and is not necessarily required to be knowledgeable on technical matters, as the MOE defines the maintenance standards. When the accountable manager is not the chief executive officer, the organization should demonstrate to the competent authority that the accountable manager has direct access to the chief executive officer and has the necessary funding allocation for the intended maintenance activities.

AMC1 145.30(b) Personnel requirements

MANAGEMENT STRUCTURE FOR MAINTENANCE

The person or group of persons nominated under point 145.30(b) and accepted by CARC , with the responsibility to ensure that the organization works in accordance with the MOE and approved procedures (i.e. responsibility for ensuring compliance) should represent the management structure of the organization and be responsible for the daily operation of the organization, in respect of all maintenance-related functions.

1. Dependent upon the size of the organization, the Part-145 maintenance functions may be divided under nominated persons or combined in any number of ways. However, a maintenance function cannot be combined with the compliance monitoring function.

   The maintenance functions include maintenance/safety training, performance and certification of maintenance, equipment and component procurement, facility management, man-hour plan, etc., and it should be ensured that each Part-145 maintenance function is attributed to one nominated person.

2. Dependent upon the extent of approval, the organization structure should normally include a base maintenance manager, a line maintenance manager and a workshop manager, all of whom should report to the accountable manager except in a small Part-145 organization where any one manager may also be the accountable manager, as determined by CARC.

3. The base maintenance manager is responsible for ensuring that all base maintenance is carried out in the base maintenance hangar (or facility as provided for in point 4 of AMC1 145.25(a)) and to the standards specified in point 145.65. The base maintenance manager is also responsible for base maintenance-related corrective actions resulting from the compliance monitoring of point 145.200(a)(6).

4. The line maintenance manager is responsible for ensuring that all line maintenance including line defect

rectification is carried out to the standards specified in point 145.65. This manager is also responsible for line maintenance-related corrective actions resulting from the compliance monitoring of point 145.200(a)(6).

5. The workshop manager is responsible for ensuring that all work on aircraft components in the workshop is carried out to the standards specified in point 145.65. This manager is also responsible for workshop-related corrective actions resulting from the compliance monitoring of point 145.200(a)(6).

6. (reserved).

7. Notwithstanding the examples of titles provided in points 2 - 5, the organization may adopt any title for the foregoing managerial positions but it should identify to CARC the titles and the persons chosen to carry out these functions.

8. Where an organization chooses to appoint managers for all or any combination of the identified maintenance functions because of the size of the undertaking, these managers should report to the accountable manager through the nominated persons.

GM1 145.30(b) Personnel requirements

RESPONSIBILITY FOR ENSURING COMPLIANCE

The person(s) nominated in accordance with 145.30(b) and who accepted by CARC, are responsible, in the day-to-day maintenance activities, for ensuring that the organization personnel work in accordance with the applicable procedures and regulatory requirements.

These nominated persons should demonstrate a complete understanding of the applicable regulatory requirements and ensure that the organization's processes and standards accurately reflect these requirements. It is their role to ensure that compliance is proactively managed, and that early warning signs of non-compliance are documented and acted upon.

AMC1 145.30(c);(ca) Personnel requirements

SAFETY MANAGEMENT AND COMPLIANCE MONITORING FUNCTION

(a) Safety management

If more than one person is designated for the development, administration and maintenance of effective safety management processes, the accountable manager should identify the person who acts as the unique focal point, i.e. the 'safety manager' who is accepted to CARC.

The functions of the safety manager should be to:

(i) facilitate hazard identification, risk assessment and management;

(ii) monitor the implementation of actions taken to mitigate risks, as listed in the safety action plan, unless action follow-up is addressed by the compliance monitoring function;

(iii) provide periodic reports on safety performance to the safety review board (the functions of the safety review board are those defined in AMC1 145.200(a)(1));

(iv) ensure the maintenance of safety management documentation;

(v) ensure that there is safety training available, and that it meets acceptable standards;

(vi) provide advice on safety matters; and

(vii) ensure the initiation and follow-up of internal occurrence investigations.

(b) Compliance monitoring function

If more than one person is designated for the compliance monitoring function, the accountable manager should identify the person who acts as the unique focal point, i.e. the 'compliance monitoring manager' who is accepted to CARC.

(1) The role of the compliance monitoring manager should be to ensure that:

(i) the activities of the organization are monitored for compliance with the applicable requirements and any additional requirements as established by the organization, and that these activities are carried out properly under the supervision of the nominated persons referred to in points (b), (c) and (ca) of point 145.30;

(ii) any maintenance contracted to another maintenance organization is monitored for compliance with the contract or work order;

(iii) an audit plan is properly implemented, maintained, and continually reviewed and improved; and

(iv) corrections and corrective actions are requested as necessary.

(2) The compliance monitoring manager should:

(i) not be one of the persons referred to in point 145.30(b);

(ii) be able to demonstrate relevant knowledge, background and appropriate experience related to the activities of the organization, including knowledge and experience in compliance monitoring; and

(iii) have access to all parts of the organization, and as necessary, any subcontracted organization.

(c) If the functions related to compliance monitoring or safety management are combined with other duties, the organization should ensure that this does not result in any conflicts of interest. In particular, the compliance monitoring function should be independent from the maintenance functions.

(d) If the same person is designated to manage both the compliance monitoring function and safety management-

related processes and tasks, the accountable manager, with regard to his or her direct accountability for safety, should ensure that sufficient resources are allocated to both functions, taking into account the size of the organization, and the nature and complexity of its activities.

(e) Subject to a risk assessment and/or mitigation actions, and agreement by CARC, with due regard to the size of the organization and the nature and complexity of its activities, the compliance monitoring manager role and/or safety manager role may be exercised by the accountable manager, provided that he or she has demonstrated the related competency.

GM1 145.30(ca) Personnel requirements

SAFETY MANAGER

(a) Depending on the size of the organization and the nature and complexity of its activities, the safety manager may be assisted by additional safety personnel in performing all the safety management tasks defined in AMC1 145.200(a)(1).

(b) Regardless of the organizational set-up, it is important that the safety manager remains the unique focal point for the development, administration, and maintenance of the organization's safety management processes.

GM1 145.30(cb) Personnel requirements

RESPONSIBILITY OF THE NOMINATED PERSONS TO THE ACCOUNTABLE MANAGER

There are different ways to set up the organization including the possibility to have managerial layers between the accountable manager and the nominated person. But the key principle is that, regardless of the arrangement, there is one nominated person responsible for each Part-145 function, this responsibility is recognized by that nominated person and the accountable manager, and a direct communication channel exists between them. The nominated person's responsibility should not be diluted into the various levels of management and should be free of conflicts of interest.

AMC1 145. 30(cc) Personnel requirements

KNOWLEDGE, BACKGROUND AND EXPERIENCE OF NOMINATED PERSON(S)

The person or persons to be nominated in accordance with points (b), (c) and (ca) of point 145.30 who are accepted to CARC should have:

(a) practical experience and expertise in the application of aviation safety standards and safe operating practices;

(b) knowledge of:

(1) human factors principles;

(2) management system requirements and their application (including safety management systems and compliance monitoring);

(c) 5 years of relevant work experience, of which at least 2 years should be from the aeronautical industry in an appropriate position;

(d) a relevant engineering or technical degree, or an aircraft technician or maintenance engineer qualification with additional education that is acceptable to CARC. 'Relevant engineering or technical degree' means a degree from aeronautical, mechanical, electrical, electronic, avionics or other studies that are relevant to the maintenance and/or continuing airworthiness of aircraft/aircraft components.

The provision set out in the first paragraph of point (d) may be replaced by 2 years of experience in addition to those already recommended by paragraph (c) above. These 2 years should cover an appropriate combination of experience in tasks/activities related to maintenance and/or continuing airworthiness management and/or the surveillance of such tasks.

For the person to be nominated in accordance with point (c) or (ca) of point 145.30, in the case where the organization holds one or more additional organization certificates and that person has already an equivalent position (i.e. compliance monitoring manager, safety manager) under the additional certificate(s) held, the provisions set out in the first two paragraphs of point (d) may be replaced by the completion of a specific training program acceptable to CARC to gain an adequate understanding of maintenance standards and continuing airworthiness concepts and principles;

(e) thorough knowledge of the organization's MOE and safety policy;

(f) knowledge of a relevant sample of the type(s) of aircraft or components gained through a formalized training course. These courses could be provided by a Part-147 organization accepted to CARC, by the manufacturer, by the Part-145 organization or by any other organization accepted by CARC. Aircraft/engine type training courses should be at least at a level equivalent to the Part-66 Appendix III Level 1 General Familiarization.

'Relevant sample' means that these courses should cover typical aircraft or components that are within the scope of work of the organization.

For all balloons and any other aircraft of 2 730 kg MTOM or less, the formalized training courses may be replaced by a demonstration of the required knowledge by providing documented evidence, or by an assessment acceptable to CARC. This assessment should be recorded;

(g) knowledge of the relevant maintenance methods (and how they are applied in the organization) and/or specific knowledge relevant to the area for which the person will be nominated;

(h) knowledge of the applicable regulations;

(i) adequate language and communication skills.

AMC1 145.30(d) Personnel requirements

SUFFICIENT NUMBER OF PERSONNEL

1. Has sufficient staff means that the organization employs or contracts competent staff, as detailed in the man-hour plan, of which at least half the staff that perform maintenance in each workshop, hangar or flight line on any shift should be employed to ensure organizational stability. For the purpose of meeting a specific operational necessity, a temporary increase of the proportion of contracted staff may be permitted to the organization by CARC, in accordance with an approved procedure which should describe the extent, specific duties, and responsibilities for ensuring adequate organization stability. For the purpose of this subparagraph, employed means the person is directly employed as an individual by the maintenance organization approved under Part-145, whereas contracted means the person is employed by another organization and contracted by that organization to the maintenance organization approved under Part-145.

2. The maintenance man-hour plan should take into account all maintenance activities carried out outside the scope of the Part-145 approval.

   The planned absence (for training, vacations, etc.) should be considered when developing the man-hour plan.

3. The maintenance man-hour plan should relate to the anticipated maintenance work load except that when the organization cannot predict such workload, due to the short term nature of its contracts, then such plan should be based upon the minimum maintenance workload needed for commercial viability. Maintenance work load includes all necessary work such as, but not limited to, planning, maintenance record checks, production of worksheets/cards in paper or electronic form, accomplishment of maintenance, inspection and the completion of maintenance records.

4. For aircraft base maintenance, the maintenance man-hour plan should relate to the aircraft hangar visit plan as specified in AMC1 145.25(a).

5. For aircraft component maintenance, the maintenance man-hour plan should relate to the aircraft component planned maintenance as specified in point 145.25(a)(2).

6. The man-hours allocated to the compliance monitoring function should be sufficient to meet the requirement of point 145.200(a)(6) which means taking into account the AMC to 145.200(a)(6). Where compliance monitoring staff also perform other functions, the time allocated to those functions needs to be taken into account in determining the number of compliance monitoring staff.

7. The maintenance man-hour plan should be reviewed at least every 3 months and updated when necessary.

8. Significant deviation from the maintenance man-hour plan should be reported through the departmental manager to the compliance monitoring manager and the accountable manager for review. It may also be reported through the internal safety reporting scheme. A significant deviation means that there is more than a 25% shortfall in available man-hours during a calendar month for any one of the functions specified in point 145.30(d).

9. In addition, as part of its management system in accordance with point 145.200, the organization should have a procedure to assess and mitigate the risks:
   (1) if the actual number of staff available is less than the planned staffing level for any particular work shift or period;
   (2) if there is a temporary increase in the proportion of contracted staff in order to meet specific operational needs.

AMC1 145.30(e) Personnel requirements

COMPETENCY ASSESSMENT OBJECTIVES

The procedure referred to in 145.30(e) should require amongst others that planners, mechanics, specialized services staff, supervisors, certifying staff and support staff, whether employed or contracted, are assessed for competency before unsupervised work commences and competency is controlled on a continuous basis.

Competency should be assessed by the evaluation of:
- on-the-job performance and/or testing of knowledge by appropriately qualified personnel, and
- records for basic, organizational, or tasks training and/or product type and differences training, and
- experience records.

Validation of the above could include a confirmation check with the organization(s) that issued the document(s). For that purpose, experience/training may be recorded in a document such as a log book, or based on the suggested template in GM3 145.30(e).

As a result of this assessment, an individual's qualifications should determine:

- the scope of tasks this individual is authorized to perform and/or supervise and/or sign off (as applicable) or which level of ongoing supervision would be required;
- whether there is a need for additional training.

A record should be kept of each individual's qualifications and competency assessment (refer also to point 145.55(d)). This should include copies of all documents that attest to their qualifications, such as a license and/or any authorization held, as applicable.

For a proper competency assessment of its personnel, the organization should consider that:

1. In accordance with the job function, adequate initial and recurrent training has been received by the staff and recorded to ensure continued competency so that it is maintained throughout the duration of the employment/contract.
2. All staff should be able to demonstrate knowledge of, and compliance with, the maintenance organization's procedures, as applicable to their duties.
3. All staff should be able to demonstrate an understanding of the safety management principles, including human factors related to their job function, and be trained as per AMC4 145.30(e).

4. To assist in the assessment of competency and to establish the training needs analysis, job descriptions are recommended for each job function in the organization. Job descriptions should contain sufficient criteria to enable the required competency assessment.
5. Criteria should allow the assessment to establish that, among other aspects (titles might be different in each organization):

   - Managers are able to properly manage the work output, processes, resources and priorities described in their assigned duties, accountabilities and responsibilities in accordance with the safety policy and objectives and in compliance with the applicable requirements.
   - Planners are able to interpret maintenance requirements into maintenance tasks, and have an understanding that they have no authority to deviate from the maintenance data. They are able to organize maintenance activities in an effective manner and in consideration of human performance limitations.
   - Supervisors are able to ensure that all the required maintenance tasks are carried out and, if they are not completed or it is evident that a particular maintenance task cannot be carried out according to the maintenance data, that these problems will be adequately addressed to eliminate the non-compliance, and reported through the internal safety reporting scheme to prevent their reoccurrence. In addition, for those supervisors, who also carry out maintenance tasks, the assessment should ensure that they understand that such tasks should not be undertaken if they are incompatible with their management responsibilities.
   - Mechanics are able to carry out maintenance tasks to any standard specified in the maintenance data, and will notify their supervisors of any defects or mistakes requiring rectification to re-establish the required maintenance standards.
   - Specialized services staff are able to carry out specialized maintenance tasks to the standard specified in the maintenance data. They should be able to communicate with their supervisors and report accurately when necessary.
   - Support staff are able to determine that the relevant tasks or inspections have been carried out to the required standard.
   - Certifying staff are able to determine when the aircraft or aircraft component maintenance is ready to be released to service and when it should not be released to service.
   - Compliance monitoring staff are able to monitor compliance with this Regulation and to identify non-compliances in an effective and timely manner so that the organization may remain in compliance with this Regulation.
   - Staff who have safety management responsibilities are familiar with the relevant processes in terms of hazard identification, risk management, and the monitoring of safety performance.

- All staff are familiar with the safety policy and the procedures and tools that can be used for internal safety reporting.

The competency assessment should be based upon the procedure specified in GM2 145.30(e).

AMC2 145.30(e) Personnel requirements

COMPETENCY ASSESSMENT PROCEDURE

(a) The organization should develop a procedure that describes the process for conducting competency assessments of personnel. The procedure should specify:

(1) the persons who are responsible for this process;

(2) when the assessments should take place;

(3) how to give credit from previous assessments;

(4) how to validate qualification records;

(5) the means and methods to be used for the initial assessment;

(6) the means and methods to be used for the continuous control of competency, including how to gather feedback on the performance of personnel;

(7) the aspects of competencies to be observed during the assessment in relation to each job function;

(8) the actions to be taken if the assessment is not satisfactory; and

(9) how to record the assessment results.

(b) Competency may be assessed by having the person work under the supervision of another qualified person for a sufficient time to arrive at a conclusion. Sufficient time could range from several days to several weeks depending on the complexity of the task(s) and the work exposure. The person need not be assessed against the complete spectrum of their intended duties. If the person has been recruited from another approved maintenance organization, a written confirmation from the previous organization could be taken into consideration to reduce the duration of the assessment.

(c) All prospective maintenance staff should be assessed for their competency related to their intended duties.

AMC3 145.30(e) Personnel requirements

INITIAL AND RECURRENT TRAINING

(a) Adequate initial and recurrent training should be provided in relation to the job function to ensure that staff remain competent. Completion of such training should be recorded.

(b) Recurrent training should take into account the information reported through the internal safety reporting scheme (see point (c)(3) of AMC1 145.202).

(c) Those responsible for managing the compliance monitoring function should receive training on this task. Such training should cover the requirements of compliance monitoring, manuals and procedures related to the task, audit techniques, reporting, and recording.

AMC4 145.30(e) Personnel requirements

SAFETY TRAINING (INCLUDING HUMAN FACTORS)

(a) With respect to the understanding of the application of safety management principles (including human factors), all maintenance organization personnel should be assessed for the need to receive initial safety training.

Personnel involved in the delivery of the basic maintenance service of the organization should receive both initial and recurrent safety training, appropriate for their responsibilities. This should include at least the following staff members:

- Nominated persons, line managers, supervisors;
- Certifying staff, support staff and mechanics;
- Technical support personnel such as planners, engineers, technical record staff;
- Persons involved in compliance monitoring and/or safety management-related processes and tasks, including the application of human factors principles, internal investigations and safety training;
- Specialized services staff;
- Stores department staff, purchasing department staff;
- Ground equipment operators.

The generic term 'line managers' refers to departmental heads or persons responsible for operational departments or functional units that are directly involved in the delivery of the basic maintenance services of the organization.

(b) Initial safety training should cover all the topics of the training syllabus specified in GM1 145.30(e) either as a dedicated course or else integrated within other training. The syllabus may be adjusted to reflect the particular nature of the organization. The syllabus may also be adjusted to suit the particular nature of work for each function within the organization. For example:

- small organization's not working in shifts may cover in less depth subjects related to teamwork and communication;
- planners may cover in more depth the scheduling and planning objectives of the syllabus, and in less depth the objective of developing skills for shift working.

All personnel identified in accordance with point (a) of this AMC, including personnel being recruited from any other organization should receive initial safety training compliant with the organization's training standards prior to commencing the actual job function, unless their competency assessment justifies that there is no need for such training. New, directly employed personnel working under direct supervision may receive training within 6 months after joining the maintenance organization.

(c) The purpose of recurrent safety training is primarily to ensure that staff remain current in terms of SMS principles and human factors and also to collect feedback on safety and human factors issues. Consideration should be given to involving compliance monitoring staff and the key safety management personnel in this training to provide a consistent presence and facilitate feedback. There should be a procedure to ensure that feedback is formally reported by the trainers through the internal safety reporting scheme to initiate action where necessary.

Recurrent safety training should be delivered either as a dedicated course or integrated within other training. It should be of an appropriate duration in each 2-year period in relation to the relevant compliance monitoring audit findings and other internal/external sources of information available to the organization on safety and human factors maintenance issues.

(d) Safety training may be conducted by the maintenance organization itself, independent trainers, or any training organizations acceptable to CARC.

(e) The safety training procedures should be specified in the MOE.

AMC5 145.30(e) Personnel requirements

OTHER TRAININGS

(a) The organization should assess the need for particular trainings, for example with regard to the 'Electrical Wiring Interconnection System' (EWIS) or 'Critical Design Configuration Control Limitations' (CDCCL).

(b) Guidance on EWIS training program for maintenance organization personnel is provided in AMC 20-22.

(c) Guidance on fuel tank safety training is provided in 'Appendix IV to AMC5 145. 30(e) .

GM1 145.30(e) Personnel requirements

TRAINING SYLLABUS FOR INITIAL SAFETY TRAINING (INCLUDING HUMAN FACTORS)

The training syllabus below identifies the topics and subtopics to be addressed during the safety training.

The maintenance organization may combine, divide, or change the order of any of the subjects in the syllabus to suit its own needs, as long as all the subjects are covered to a level of detail appropriate to the organization and its personnel, including the varying level of seniority of that personnel.

Some of the topics may be covered in separate training courses (e.g. health and safety, management, supervisory skills, etc.) in which case duplication of training is not necessary.

Where possible, practical illustrations and examples should be used, especially accident and incident reports.

Topics should be related to existing legislation, where relevant. Topics should be related to existing guidance/advisory material, where relevant (e.g. ICAO HF Digests and Training Manual).

Topics should be related to the maintenance activities of the organization to the greatest extent possible; too much unrelated theory should be avoided.

1. General/Introduction to safety management and human factors

    1.1 Need to address safety management and human factors
    1.2 Statistics
    1.3 Incidents

2. Safety risk management 1a.1. Hazard identification

    2.1 Safety risk assessment
    2.2 Risk mitigation and management
    2.3 Effectiveness of safety risk management

3. Safety Culture/Organizational factors

    3.1 Justness/trust
    3.2 Commitment to safety
    3.3 Adaptability
    3.4 Awareness
    3.5 Behavior
    3.6 Information

4. Human Error

    4.1 Error models and theories
    4.2 Types of errors in maintenance tasks
    4.3 Violations
    4.4 Implications of errors
    4.5 Avoiding and managing errors
    4.6 Human reliability

5. Human performance & limitations

    5.1 Vision
    5.2 Hearing

5.3 Information-processing
5.4 Attention and perception
5.5 Situational awareness
5.6 Memory
5.7 Claustrophobia and physical access
5.8 Motivation
5.9 Fitness/health
5.10 Stress
5.11 Workload management
5.12 Fatigue
5.13 Alcohol, medication, drugs
5.14 Physical work
5.15 Repetitive tasks/complacency

6. Environment

6.1 Peer pressure
6.2 Stressors
6.3 Time pressure and deadlines
6.4 Workload
6.5 Shift work
6.6 Noise and fumes
6.7 Illumination
6.8 Climate and temperature
6.9 Motion and vibration
6.10 Complex systems
6.11 Other hazards in the workplace
6.12 Lack of manpower
6.13 Distractions and interruptions

7. Procedures, information, tools and practices

7.1 Visual inspection
7.2 Work logging and recording
7.3 Procedure - practice/mismatch/norms
7.4 Technical documentation - access and quality
7.5 Critical maintenance tasks and error-capturing methods (independent inspection, reinspection, etc.)

8. Communication

8.1 Shift/task handover
8.2 Dissemination of information
8.3 Cultural differences

9. Teamwork

9.1 Responsibility
9.2 Management, supervision and leadership
9.3 Decision-making

10. Professionalism and integrity

10.1 Keeping up to date; currency
10.2 Avoiding error-provoking behavior
10.3 Assertiveness

11. Organization's safety program

11.1 Safety policy and objectives, just culture principles
11.2 Reporting errors and hazards, internal safety reporting scheme
11.3 Investigation process
11.4 Action to address problems
11.5 Feedback and safety promotion

GM2 145.30(e) Personnel requirements

COMPETENCY ASSESSMENT ELEMENTS

An example of elements that may be considered during a competency assessment according to the job functions and the scope, size and complexity of the organization, is given in the following table (not exhaustive):

	Managers	Planners	Supervisor	Certifying staff and support staff	Mechanics	specialized Service staff	Compliance monitoring staff	Safety management personnel
Knowledge of applicable officially recognized standards						X	X	
Knowledge of auditing techniques: planning, conducting and reporting							X	X
Knowledge of safety management, human factors, human performance and limitations, and just culture	X	X	X	X	X	X	X	X
Knowledge of logistics processes	X	X	X					
Knowledge of organization capabilities, privileges and limitations	X	X	X	X		X	X	X
Knowledge of Part-M, , Part- 145 and any other relevant regulations	X	X	X	X			X	X
Knowledge of relevant parts of the maintenance organization exposition and procedures	X	X	X	X	X	X	X	X
Knowledge of occurrence reporting (mandatory and voluntary), internal reporting scheme and understanding of the importance of reporting occurrences, incorrect maintenance data and existing or potential defects	X	X	X	X	X	X		X
Knowledge of safety risks linked to the working environment	X	X	X	X	X	X	X	X
Knowledge of CDCCL when relevant	X	X	X	X	X	X	X	X
Knowledge of EWIS when relevant	X	X	X	X	X	X	X	X

	Managers	Planners	Supervisor	Certifying staff and support staff	Mechanics	specialized Service staff	Compliance monitoring staff	Safety management personnel
Understanding of professional integrity, behavior and attitude towards safety	X	X	X	X	X	X	X	X
Understanding of conditions for Ensuring continuing airworthiness of aircraft and components				X			X	
Understanding of his or her own human performance and limitations	X	X	X	X	X	X	X	X
Understanding of personnel authorizations and limitations	X	X	X	X	X	X	X	
Understanding critical maintenance tasks	X	X	X	X	X		X	X
Ability to compile and control completed work cards		X	X	X				
Ability to consider human and limitations	X	X	X	X			X	X
Ability to determine the required qualifications for task performance		X	X	X				
Ability to identify and rectify existing and potential unsafe conditions	X		X	X	X	X	X	X
Ability to manage third parties involved in maintenance activity	X	X	X					
Ability to confirm proper of maintenance tasks			X	X	X	X		
Ability to identify and properly plan performance of critical maintenance		X	X	X				
Ability to priorities tasks and report discrepancies		X	X	X	X			
Ability to process the work requested by the operator		X	X	X				
Ability to promote the safety policy	X		X					X
Ability to properly process removed uninstalled and rejected parts			X	X	X	X		
Ability to properly record and sign for accomplished			X	X	X	X		
Ability to recognize the acceptability of parts to be installed prior to fitment			X	X	X			

	Managers	Planners	Supervisor	Certifying staff and support staff	Mechanics	Specialized Service staff	Compliance monitoring staff	Safety management personnel
Ability to split complex maintenance tasks into clear stages		X	X					
Ability to understand work orders, work cards and refer to and use applicable maintenance data		X	X	X	X	X	X	
Ability to use information systems	X	X	X	X	X	X	X	X
Ability to use, control and be familiar with the required tooling and/or equipment			X	X	X	X		
Adequate communication and literacy skills	X	X	X	X	X	X	X	X
Analytical and proven auditing skills (for example, objectivity, fairness, open-mindedness, determination, …)							X	X
Maintenance error investigation skills							X	X
Resources management and production planning skills	X	X	X					
Teamwork, decision-making and leadership skills	X		X	X			X	X
Ability to encourage a positive safety culture and apply a just culture	X		X				X	X

GM3 145.30(e) Personnel requirements

TEMPLATE FOR RECORDING EXPERIENCE/TRAINING

The following template may be used to record the professional experience gained in an organization and the training received and to be considered during the competency assessment of an individual in another organization.

Aviation Maintenance personnel experience credential		
Name Address	Given name	
Telephone	E-mail	
Independent worker ☐		
Trade Group: airframe ☐ engine ☐ electric ☐ avionics ☐ other (specify) ☐……		
Employer's details (when applicable) Name Address Telephone		
Maintenance organization details Name Address Telephone Approval Number Period of employment From: To:		
Domain of employment		
☐ Planning	☐ Engineering	☐ Technical records
☐ Store department	☐ Purchasing	
Mechanics/Technician		
☐ Line Maintenance ☐ Servicing ☐ Maintenance ☐ Trouble-shooting	☐ Base Maintenance ☐ Removal/installation ☐ Testing/inspection Scheduled ☐ Trouble-shooting ☐ Repair	☐ Component Maintenance ☐ Overhaul Repair ☐ Re-treatment ☐ Inspection ☐ Reassembly Component type
A/C type	A/C type	
Certifying Staff and support staff ☐ Cat. A Type ☐ Cat. B1 A/C Type ☐ Cat. B2 A/C Type ☐ Cat. C Component Type ☐ Component type Specify ☐ Other (e.g. NDT) A/C Type A/C		
Certification privileges: Yes ☐ / No ☐		

☐ Specialized services	Specialty *(NDT, composites, welding, etc.)*:	
☐ Skilled personnel	Specialty *(sheet metal, structures, wireman, upholstery, etc.)*: Ground equipment operation	
☐ Supervision	☐ Compliance monitoring	☐ Training
☐ Safety investigation	☐ Safety management	
	Total number of check boxes ticked:	

Details of employment

Training received from the contracting organization

Date Nature of training

Certified by:

Name: Date:

Position: Signature:

Contact details:

Advisory note: A copy of the present credentials will be kept for at least 3 years from their issuance by the maintenance organization.

GM4 145.30(e) Personnel requirements

COMPETENCY OF THE SAFETY MANAGER

The competency of a safety manager should include, but not be limited to, the following:

(a) knowledge of ICAO standards and European requirements on safety management;
(b) an understanding of management systems, including compliance monitoring systems;
(c) an understanding of risk management;
(d) an understanding of safety investigation techniques and root cause methodologies;
(e) an understanding of human factors;
(f) understanding and promotion of a positive safety culture;
(g) operational experience related to the activities of the organization;
(h) safety management experience;
(i) interpersonal and leadership skills, and the ability to influence staff;
(j) oral and written communications skills;
(k) data management, analytical and problem-solving skills.

GM5 145.30(e) Personnel requirements

SAFETY TRAINING (INCLUDING HUMAN FACTORS)

(a) The scope of the safety training and the related training program will vary significantly depending on the size and complexity of the organization. Safety training should reflect the evolving management system, and the changing roles of the personnel who make it work.
(b) In recognition of this, training should be provided to management and staff at least:
    (1) during the initial implementation of safety management processes;
    (2) for all new staff or personnel recently allocated to safety management-related tasks;
    (3) on a regular basis to refresh their knowledge and to understand changes to the management system;
    (4) when changes in personnel affect safety management roles, and related accountabilities, responsibilities, and authorities; and
    (5) NOTE: In the context of safety management, the term 'authority' is used in relation to the level of management in the organization that is necessary to make decisions related to risk tolerability.
    (6) when performing dedicated safety functions in domains such as safety risk management, compliance monitoring, and internal investigations.
(c) Safety training is subject to the record-keeping requirements in point 145.55(d).

AMC 145.30(f) Personnel requirements

1. Continued airworthiness non-destructive testing means such testing specified by the type certificate holder or the declarant of a declaration of design compliance, aircraft or engine or propeller manufacturer, in accordance with the maintenance data as specified in 145.45 for in service aircraft/aircraft components for the purpose of determining the continued fitness of the product to operate safely.
2. Appropriately qualified means to Level 1, 2 or 3 as defined by the National or International accepted Standard (e.g. EN 4179) dependent upon the non-destructive testing function to be carried out.
3. Notwithstanding the fact that Level 3 personnel may be qualified via EN 4179 to establish and authorize methods, techniques, etc., this does not permit such personnel to deviate from methods and techniques published in the maintenance data, unless the maintenance data the expressly permits such deviation.
4. Notwithstanding the general references in EN 4179 to an aerospace non-destructive testing (NDT) board, all examinations should be conducted by personnel or organizations approved or accredited by such a board. In the absence of a national aerospace NDT board, the aerospace NDT board of another contracted states should be used, as accepted by CARC.
5. Particular non-destructive test means any one or more of the following; Dye penetrant, magnetic particle, eddy current, ultrasonic and radiographic methods including X ray and gamma ray.
6. It should be noted that new methods are and will be developed, such as, but not limited to thermography and shearography, which are not specifically addressed by EN 4179. Until the time this agreed standard is established, such methods should be carried out in accordance with the particular equipment manufacturer's recommendations including any training and examination process to ensure competence of the personnel in the process.
7. Any maintenance organization approved under Part-145 that carries out NDT should establish NDT specialist qualification procedures detailed in the exposition and accepted by CARC.
8. Boroscoping and other techniques such as delamination coin tapping are non-destructive inspections rather than non-destructive testing. Notwithstanding such differentiation, the maintenance organization should establish an exposition procedure accepted by CARC to ensure that personnel who carry out and interpret such inspections are properly trained and assessed for their competence in the process. Non-destructive inspections, not being considered as NDT by Part-145 are not listed in Appendix II under class rating D1.
9. The referenced standards, methods, training and procedures should be specified in the maintenance organization exposition.
10. Any such personnel who intend to carry out and/or control a non-destructive test for which they were not qualified prior to the effective date of Part-145 should qualify for such non- destructive test in accordance with EN 4179.

11. In this context officially recognized standard means those standards established or published by an official body whether having legal personality or not, which are widely recognized by the air transport sector as constituting good practice.

AMC 145.30(g) Personnel requirements

1. For the purposes of 66.20(a)(1) and 66.20(a)(3)(ii) personnel, minor scheduled line maintenance means any minor scheduled inspection/check up to and including a weekly check specified in the aircraft maintenance program. For aircraft maintenance programs that do not specify a weekly check, CARC will determine the most significant check that is considered equivalent to a weekly check.
2. Typical tasks permitted after appropriate task training to be carried out by the 66.20(a)(1) and the 66.20(a)(3)(ii) personnel for the purpose of these personnel issuing an aircraft certificate of release to service as specified in 145.50 as part of minor scheduled line maintenance or simple defect rectification are contained in the following list:
   (a) Replacement of wheel assemblies.
   (b) Replacement of wheel brake units.
   (c) Replacement of emergency equipment
   (d) Replacement of ovens, boilers and beverage makers.
   (e) Replacement of internal and external lights, filaments and flash tubes.
   (f) Replacement of windscreen wiper blades.
   (g) Replacement of passenger and cabin crew seats, seat belts and harnesses.
   (h) Closing of cowlings and refitment of quick access inspection panels.
   (i) Replacement of toilet system components but excluding gate valves.
   (j) Simple repairs and replacement of internal compartment doors and placards but excluding doors forming part of a pressure structure.
   (k) Simple repairs and replacement of overhead storage compartment doors and cabin furnishing items.
   (l) Replacement of static wicks.
   (m) Replacement of aircraft main and APU aircraft batteries.
   (n) Replacement of in-flight entertainment system components other than public address.
   (o) Routine lubrication and replenishment of all system fluids and gases.
   (p) The de-activation only of sub-systems and aircraft components as permitted by the operator's minimum equipment list where such de-activation is agreed by CARC as a simple task.

(q) Inspection for and removal of de-icing/anti-icing fluid residues, including removal/closure of panels, cowls or covers or the use of special tools.

(r) Any other task agreed by CARC as a simple task for a particular aircraft type. This may include defect deferment when all the following conditions are met:

(a) There is no need for troubleshooting; and

(b) The task is in the MEL; and

(c) The maintenance action required by the MEL is agreed by CARC to be simple

In the particular case of helicopters, and in addition to the items above, the following:

(s) removal and installation of Helicopter Emergency Medical Service (HEMS) simple internal medical equipment.

(t) removal and installation of external cargo provisions (i.e., external hook, mirrors) other than the hoist.

(u) removal and installation of quick release external cameras and search lights.

(v) removal and installation of emergency float bags, not including the bottles.

(w) removal and installation of external doors fitted with quick release attachments.

(x) removal and installation of snow pads/skid wear shoes/slump protection pads.

No task which requires troubleshooting should be part of the authorized maintenance actions. Release to service after rectification of deferred defects should be permitted as long as the task is listed above.

3. The requirement of having appropriate aircraft-rated certifying staff qualified as category B1, B2,B3, as appropriate, in the case of aircraft line maintenance does not imply that the organization must have B1, B2 and B3 personnel at every line station. The MOE should have a procedure on how to deal with defects requiring those categories of certifying staff.

4. CARC may accept that in the case of aircraft line maintenance an organization has only B1, B2 or B3 certifying staff, as appropriate, provided that CARC is satisfied that the scope of work, as defined in the MOE, does not need the availability of all those categories of certifying staff. Special attention should be taken to clearly limit the scope of scheduled and non-scheduled line maintenance (defect rectification) to only those tasks that can be certified by the available category of certifying staff.

AMC1 145.30(h) Personnel requirements

In accordance with points 145.30(h) and 145.35, the qualification requirements (basic license, aircraft ratings, recent experience and recurrent training) are identical for certifying staff and for support staff. The only difference is that support staff cannot hold certification privileges when performing this role since during base maintenance, the release to service will be issued by category C certifying staff.

Nevertheless, the organization may use as support staff (for base maintenance) persons who already hold certification privileges for line maintenance.

AMC1 145.30(j)(4) Personnel requirements

1. For the issue of a limited certification authorization, the commander should hold either an air transport pilots license (ATPL), or a commercial pilots license (CPL).

2. In addition, the limited certification authorization is subject to the MOE containing procedures to address the personnel requirements of point 145.30(e) and associated AMC and guidance material. The procedures should be accepted by CARC and should include as a minimum:

   (a) completion of adequate continuing airworthiness regulation training as related to maintenance;

   (b) completion of adequate task training for the specific task(s) on the aircraft. The task training should be of sufficient duration to ensure that the individual has a thorough understanding of the task(s) to be completed, and that it will involve training in the use of the associated maintenance data;

   (c) completion of the procedural training as specified in Part-145.

2.(i) Typical tasks that may be certified and/or carried out by a pilot who holds an ATPL or a CPL are the minor maintenance or simple checks included in the following list:

   (a) Replacement of internal lights, filaments and flash tubes;.

   (b) Closing of cowlings and refitment of quick-access inspection panels;.

   (c) Role changes, e.g. stretcher installation, dual controls, FLIR, doors, photographic equipment, etc.

   (d) Inspection for, and removal of, de-icing/anti-icing fluid residues, including the removal/closure of panels, cowls or covers that are easily accessible, but that do not require the use of special tools;.

   (e) Any check/replacement that involves simple techniques that are consistent with this AMC and that have been agreed by **CARC**.

3. The validity of the authorization should be limited to twelve months, and may be renewed if there has been satisfactory recurrent training on the task(s) for which the pilot holds an authorization.

AMC1 145.30(j)(5) Personnel requirements

1. For the purposes of point 145.30(j)(5), 'unforeseen' means that the grounding of the aircraft could not reasonably have been predicted by the operator because the defect was unexpected, due to it being part of a hitherto reliable system.

2. Issuing a one-off authorization should only be considered under the responsibility of the compliance monitoring manager of the contracted organization after a reasoned judgement has been made that such an authorization is appropriate under the circumstances, while at the same time it maintains the required airworthiness standards. The organization's compliance monitoring personnel should assess each situation individually prior to issuing a one-off authorization, and may request contribution from technical and safety management personnel.

3. A one-off authorization should not be issued if the level of certification required could exceed the knowledge and experience level of the person it is issued to. In all cases, due consideration should be given to the complexity of the work involved and the availability of the required tooling and/or test equipment needed to complete the work.

AMC 145.30(j)(5)(i) Personnel requirements

In case it is necessary to issue a one-off certification authorization to a certifying staff on an aircraft type for which he or she does not hold a type-rated authorization, the following procedure is recommended:

1. The flight crew should communicate full details of the defect to the maintenance organization. If necessary, the maintenance organization will then request the use of a one-off authorization from the compliance monitoring personnel.

2. When issuing a one-off authorization, the compliance monitoring personnel should verify that:

   (a) full technical details relating to the work required to be carried out have been established and passed on to the certifying staff;.

   (b) the organization has an approved procedure in place for coordinating and controlling the total maintenance activity undertaken at the location under the authority of the one-off authorization;

   (c) the person to whom a one-off authorization is issued has been provided with all the necessary information and guidance relating to maintenance data, and any special technical instructions associated with the specific task undertaken. A detailed step-by- step worksheet has been defined by the organization, and has been communicated to the holder of the one-off authorization;

   (d) the person holds authorizations of equivalent levels and scopes on other aircraft types that have similar technology, construction and systems.

3. The holder of the one-off authorization should sign off the detailed step-by-step worksheet when completing the work steps. The completed tasks should be verified by visual examination and/or normal system operation upon return to an appropriately approved Part-145 maintenance facility.

AMC1 145.30(j)(5)(ii) Personnel requirements

Point 145.30(j)(5)(ii) addresses the requirements for staff who are not employed by the maintenance organization, but who meet the requirements of point 145.30(j)(5). In addition to the items listed in points 1, 2(a), (b) and (c) and 3 of AMC1 145.30(j) (5)(i), the compliance monitoring personnel of the organization may issue such a one-off authorization provided that full details relating to the qualifications of the proposed certifying personnel are verified by the compliance monitoring personnel and made available at the location.

AMC 145.35(a) Certifying staff and support staff

1. Holding a Part-66 license with the relevant type/group rating, or meet CARC required qualification in

the case of components, does not mean by itself that the holder is qualified to be authorized as certifying staff and/or support staff. The organization is responsible for assessing the competency of the holder for the scope of the maintenance to be authorized.

2. The sentence 'the organization shall ensure that certifying staff and support staff have an adequate understanding of the relevant aircraft and/or components to be maintained together with the associated organization procedures' means that the person has received training and has been successfully assessed on:

   (a) the type of aircraft or component;

   (b) the differences on:

   - the particular model/variant;
   - the particular configuration.

   The organization should specifically ensure that the individual competencies have been established with regard to:

   (c) relevant knowledge, skills and experience in the product type and configuration to be maintained, taking into account the differences between the generic aircraft type rating training that the person received and the specific configuration of the aircraft to be maintained.

   (d) appropriate attitude towards safety and observance of procedures.

   (e) knowledge of the associated organization and operator procedures (i.e. handling and identification of components, MEL use, Technical Log use, independent checks, etc.).

3. Some special maintenance tasks may require additional specific training and experience, including but not limited to:

   (f) in-depth troubleshooting;

   (g) very specific adjustment or test procedures;

   (h) rigging;

   (i) engine run-up, starting and operating the engines, checking engine performance characteristics, normal and emergency engine operation, associated safety precautions and procedures;

   (j) extensive structural/system inspection and repair;

   (k) other specialized maintenance required by the maintenance program.

   For engine run-up training, simulators and/or real aircraft should be used.

4. The assessment of the competency of the holder should be conducted in accordance with a procedure approved by CARC (item 3.9 of the MOE, as described in AMC1 145.70(a)).

5. The organization should hold copies of all the documents that attest to the competency and recent

experience of the holder for the period described in point 145.55(d)(4).

Additional information is provided in AMC 66.20(b)3.

AMC 145.35(b) Certifying staff and support staff

The organization issues the certification authorization when satisfied that compliance has been established with the appropriate paragraphs of Part-145 and Part-66. In granting the certification authorization the maintenance organization approved under Part-145 needs to be satisfied that the person holds a valid Part-66 aircraft maintenance license and may need to confirm such fact with CARC.

AMC 145.35(c) Certifying staff and support staff

For the interpretation of '6 months of actual relevant aircraft maintenance experience in any consecutive 2-year period', the provisions of AMC 66.20(b)2 are applicable.

AMC1 145.35(d) Certifying staff and support staff

1. Recurrent training is a two-way process to ensure that certifying staff and support staff remain current in terms of the necessary technical knowledge, procedures, and safety management (including human factors), and that the organization receives feedback on the adequacy of its procedures and maintenance instructions. Due to the interactive nature of this training, consideration should be given to involving the compliance monitoring staff and the key safety management personnel in this training to provide a consistent presence and facilitate feedback. There should be a procedure to ensure that feedback is formally reported by the trainers through the internal safety reporting scheme to initiate action where necessary.
2. Recurrent training should cover changes made to the modification standard of the products being maintained, to the relevant requirements such as Part-145, to the organization's procedures, safety policy and objectives, as well as human factors and safety issues identified from internal or external analysis of incidents and compliance monitoring results. It should also address instances in which staff failed to follow the procedures, and the reasons why particular

   procedures were not always followed. In many cases, the recurrent training will reinforce the need to follow the procedures and will ensure that incomplete or incorrect procedures are identified to the company so that they can be corrected. It may be necessary to carry out an audit of these procedures.
3. Recurrent training should be of sufficient duration in each 2-year period to meet the intent of point 145.35(d) and may be split into a number of separate elements. Point 145.35(d) requires such a training to keep certifying staff and support staff updated in terms of relevant technology, procedures, safety management and human factors issues which means it is one part of ensuring compliance. Therefore, sufficient duration should be related to relevant audit findings and other internal / external sources of information available to the organization on human errors and safety issues in maintenance. This means that in the case of an organization that maintains aircraft with limited relevant audit findings, hazards and related safety risks identified, recurrent training could be limited to days rather than weeks, whereas in the case of a similar organization with a number of relevant audit findings, hazards and related safety risks

identified, such a training may take several weeks. For an organization that maintains aircraft components, the duration of recurrent training would follow the same philosophy but should be scaled down to reflect the more limited nature of the activity. For example, certifying staff who release hydraulic pumps may only require a few hours of recurrent training, whereas those who release turbine engines may only require a few days of such a training. The content of recurrent training should be related to relevant audit findings, hazards and related safety risks identified. It is recommended that such training is reviewed at least once in every 24-month period.

4. The method of training is intended to be a flexible process, and this training could, for example, be provided by a Part-147 organization, an aeronautical college, the Part-145 organization, or another training or maintenance organization. The elements, general content and length of such training should be specified in the MOE.

AMC1 145.35(e) Certifying staff and support staff

The program for recurrent training should list all certifying staff and support staff and when the training will take place, the elements of such a training, and an indication that it was carried out on time as planned. Such information should subsequently be transferred to the certifying staff and to the support staff records as required by point 145.55(d)(3).

AMC1 145.35(f) Certifying staff and support staff

As stated in point 145.35(f), except where any of the unforeseen cases of point 145.30(j)(5) applies, all prospective certifying staff and support staff should be assessed for their competency related to their intended duties. Said assessment should be conducted in accordance with AMC 1, 2, 3, 4 and 5 to point 145.30(e), as applicable.

AMC1 145.35(m) Certifying staff and support staff

1. It is the responsibility of the Part-145 organization issuing the category A certifying staff authorization to ensure that the task training received by this person covers all the tasks to be authorized. This is particularly important in those cases where the task training has been provided by a Part-147 organization or by a Part-145 organization different from the one issuing the authorization.

2. 'Appropriately approved in accordance with Part-147means an organization holding an approval to provide category A task training for the corresponding aircraft type.

3. 'Appropriately approved in accordance with Part-145 means an organization holding a maintenance organization approval for the corresponding aircraft type.

AMC1 145.35(n) Certifying staff and support staff

1. The privilege for a B2 license holder to release minor scheduled line maintenance and simple defect rectification in accordance with 66.20(a)(3)(ii) can only be granted by the Part-145 approved

organization where the license holder is employed/contracted after meeting all the requirements specified in 145.35(o). This privilege cannot be transferred to another Part-145 approved organization.

2. When a B2 license holder already holds a certifying staff authorization containing minor scheduled line maintenance and simple defect rectification for a particular aircraft type, new tasks relevant to category A can be added to that type without requiring another 6 months of experience. However, task training (theoretical plus practical hands-on) and examination/assessment for these additional tasks is still required.
3. When the certifying staff authorization intends to cover several aircraft types, the experience may be combined within a single 6-month period.
4. For the addition of new types to the certifying staff authorization, another 6 months should be required unless the aircraft is considered similar per AMC 66.20(b)2 to the one already held.
5. The term '6 months of experience' may include full-time employment or part-time employment. The important aspect is that the person has been involved during a period of 6 months (not necessarily every day) in those tasks which are going to be part of the authorization.

AMC1 145.37 Airworthiness review staff

(a) 'Experience in continuing airworthiness' in 145.37(a)(1) refers to any appropriate combination of experience in tasks related to aircraft maintenance and/or continuing airworthiness management and/or surveillance of such tasks.

(b) 'Appropriate recent continuing airworthiness experience' in 145.37(c) refers to the fact that in order to keep the validity of the airworthiness review staff authorization, the airworthiness review staff should have either:

(1) been involved in continuing airworthiness management activities for at least 6 months in every 2-year period; or

(2) conducted at least one airworthiness review in the last 12-month period.

(c) In order to restore the validity of the authorization, the airworthiness review staff should conduct at a satisfactory level an airworthiness review under the supervision of CARC or, if accepted by CARC, under the supervision of another currently authorized airworthiness review staff of the organization concerned in accordance with an approved procedure.

GM1 145.37(b) Airworthiness review staff

ACCEPTANCE AND AUTHORISATION OF AIRWORTHINESS REVIEW STAFF (ARS)

The process of acceptance and authorization of a new ARS within a Part-145 organization includes the following steps (the order of certain steps may vary):

- The organization verifies the compliance of the candidate ARS with point 145.37(a);
- The candidate ARS is assessed while performing an airworthiness review (AR) under supervision

(supervision by CARC or supervision by an ARS already authorized by the organization) (145.37(b));
- The organization submits an application for change (requiring prior approval) to CARC (ref. 145.85) together with the proposed amendment to the MOE (candidate ARS introduced in the list of ARS — ref. 145.70(a)(6));
- Based on the results of the AR and its supervision, CARC accepts the candidate (regardless of whether the supervision was done by CARC or by the organization);
- CARC approves the MOE;
- The organization issues the AR authorization to the ARS.

AMC 145.40(a) Equipment and tools

Once the applicant for approval has determined the intended scope of work for consideration by CARC, it will be necessary to show that all tools and equipment as specified in the maintenance data can be made available when needed. All such tools and equipment that require to be controlled in terms of servicing or calibration by virtue of being necessary to measure specified dimensions and torque figures, etc., should be clearly identified and listed in a control register including any personal tools and equipment that the organization agrees can be used.

AMC 145.40(b) Equipment and tools

1. The control of these tools and equipment requires that the organization has a procedure to inspect/service and, where appropriate, calibrate such items on a regular basis and indicate to users that the item is within any inspection or service or calibration time-limit. A clear system of labelling all tooling, equipment and test equipment is therefore necessary giving information on when the next inspection or service or calibration is due and if the item is unserviceable for any other reason where it may not be obvious. A register should be maintained for all precision tooling and equipment together with a record of calibrations and standards used.
2. Inspection, service or calibration on a regular basis should be in accordance with the equipment manufacturers' instructions except where the organization can show by results that a different time period is appropriate in a particular case.
3. In this context officially recognized standard means those standards established or published by an official body whether having legal personality or not, which are widely recognized by the air transport sector as constituting good practice.

AMC1 145.42(a)(i) Components

1. A document equivalent to a CARC Form 18 OF-0227 may be:
   (a) a release document issued by an organization under the terms of a bilateral agreement signed by CARC;
   (b) EASA Form 1 issued by EASA Part-21 or 145 Organizations;
   (c) FAA Form 8130-3 (or 8130-4 for engines) from FAA Approved Part-21 or 145 Organizations;

(d) TCAA Form 1 Release Form from Canada CAA approved organizations;

(e) ANAC Form F 100-01 Release Form from Brazilian approved organizations;

(f) UKCAA Form 1 release form from UK approved organizations.

(g) Certificate of Conformity for standard parts, raw materials and chemicals;

(h) a JAA Form One issued prior to 28 November 2004 by a JAR 145 organization approved by a JAA Full Member State;

(i) a JAA Form One issued prior to 28 September 2005 by a production organization approved by a competent authority in accordance with its national regulations.

(j) A " declaration of maintenance accomplished " issued be the person or organization that performed the maintenance, as specified in point M.502 (e).

GM1 145.42(a)(i) Components

Point 21.A.307(b) of (Part 21) specify the new components that do not need an EASA Form 1 (CARC Form 18 OF-0227) or equivalent to be eligible for installation. Point 21.A.307(c) of (Part 21) specify the conditions for the document accompanying the component.

AMC1 145.42(a)(ii) Components

UNSERVICEABLE COMPONENTS

(a) The organization should ensure the proper identification of any unserviceable components. The unserviceable status of the component should be clearly declared on a tag together with the component identification data and any information that is useful to define actions that are necessary to be taken. Such information should state, as applicable, in-service times, maintenance status, preservation status, failures, defects or malfunctions reported or detected, exposure to adverse environmental conditions, and whether the component is installed on an aircraft that was involved in an accident or incident. Means should be provided to prevent unintentional separation of this tag from the component.

(b) Unserviceable components should typically undergo maintenance due to:

(1) expiry of the service life limit as defined in the aircraft maintenance program;

(2) non-compliance with the applicable airworthiness directives and other continuing airworthiness requirements mandated by the CARC;

(3) absence of the necessary information to determine the airworthiness status or eligibility for installation;

(4) evidence of defects or malfunctions; or

(5) being installed on an aircraft that was involved in an incident or accident likely to affect the component's serviceability.

AMC1 145.42(a)(iii) Components

UNSALVAGEABLE COMPONENTS

The following types of components should typically be classified as unsalvageable:

(a) components with non-repairable defects, whether visible or not to the naked eye;

(b) components that do not meet design specifications, and cannot be brought into conformity with such specifications;

(c) components subjected to unacceptable modification or rework that is irreversible;

(d) parts with mandatory life limitations that have reached or exceeded these limitations, or have missing or incomplete records;

(e) components whose airworthy condition cannot be restored due to exposure to extreme forces, heat or adverse environmental conditions;

(f) components for which conformity with an applicable airworthiness directive cannot be accomplished;

(g) components for which maintenance records and/or traceability to the manufacturer cannot be retrieved.

AMC1 145.42(a) (iv) Components

STANDARD PARTS

(a) Standard parts are parts that are manufactured in complete compliance with an established industry, Agency, competent authority or other government specification which includes design, manufacturing, test and acceptance criteria, and uniform identification requirements. The specification should include all the information that is necessary to produce and verify conformity of the part. It should be published so that any party may manufacture the part. Examples of specifications are National Aerospace Standards (NAS), Army-Navy Aeronautical Standard (AN), Society of Automotive Engineers (SAE), SAE Sematec, Joint Electron Device Engineering Council, Joint Electron Tube Engineering Council, and American National Standards Institute (ANSI), EN Specifications, etc.

(b) To designate a part as a standard part, the TC holder or the declarant of a declaration of design compliance may issue a standard parts manual accepted by the competent authority of the original TC holder, or the declarant of a declaration of design compliance, or may make reference in the parts catalogue to the specification to be met by the standard part. Documentation that accompanies standard parts should clearly relate to the particular parts and contain a conformity statement plus both the manufacturing and supplier source. Some materials are subject to special conditions, such as storage conditions or life limitation, etc., and this should be included in the documentation and/or the material's packaging.

(c) CARC Form 18 OF-0227 or equivalent is not normally issued and, therefore, none should be expected.

AMC2 145.42(a)(iv) Components

STANDARD PARTS

For sailplanes and powered sailplanes, non-required instruments and/or equipment that are certified or declared (in accordance with Part 21 Subpart C) under CS 22.1301(b), if those instruments or equipment, when installed, functioning improperly or not functioning at all, do not in themselves, or by their effect upon the sailplane and its operation, constitute a safety hazard.

'Required' in the term 'non-required', as used above, means required by the applicable airworthiness code (CS 22.1303, 22.1305 and 22.1307) or required by the relevant regulations for air operations and the applicable Rules of the Air or as required by air traffic management (e.g. a transponder in certain controlled airspace). Examples of non-required equipment which can be considered to be standard parts may be electrical variometers, bank/slip indicators ball-type, total energy probes, capacity bottles (for variometers), final glide calculators, navigation computers, data logger/barograph/turnpoint camera, bug-wipers and anti-collision systems. Equipment which must be approved in accordance with the airworthiness code shall comply with the applicable TSO **issued by EASA or FAA** or equivalent and it is not considered to be a standard part (e.g. oxygen equipment).

AMC1 145.42(a)(v) Components

MATERIAL

(a) Consumable material is any material, which is only used once, such as lubricants, cements, compounds, paints, chemical dyes and sealants, etc.

(b) Raw material is any material that requires further work to make it into a component part of the aircraft, such as metal, plastic, wood, fabric, etc.

(c) Material both raw and consumable should only be accepted when satisfied that it is to the required specification. To be satisfied, the material and/or its packaging should be marked with the applicable specification and, where appropriate, the batch number.

(d) Documentation that accompanies all materials should clearly relate to the particular material and contain a conformity statement plus both the manufacturing and supplier source. Some materials are subject to special conditions, such as storage conditions or life limitation, etc., and this should be included in the documentation and/or the material's packaging.

(e) CARC Form 18 OF-0227 or equivalent should not be issued for such materials and, therefore, none should be expected. The material specification is normally identified in the data issued by the (S)TC holder or the declarant of a declaration of design compliance except in the case where **CARC** has agreed otherwise.

AMC1 145.42(b)(i) Components

ACCEPTANCE OF COMPONENTS FOR INSTALLATION

(a) The procedures for the acceptance of components, standard parts and materials should have the objective of ensuring that the components, standard parts and materials are in satisfactory condition and meet the organization's requirements. These procedures should be based upon incoming inspections which include:

(1) physical inspection of the components, standard parts and materials;
(2) review of the accompanying documentation and data, which should be acceptable in accordance with 145.42(a).

(b) For the acceptance of components, standard parts and materials from suppliers, the above procedures should include supplier evaluation procedures.

GM1 145.42(b)(i) Components

INCOMING PHYSICAL INSPECTION

(a) To ensure that components, standard parts and materials are in satisfactory condition, the organization should perform incoming physical inspections.

(b) The incoming physical inspection should be performed before the component is installed on the aircraft.

(c) The following list, although not exhaustive, contains typical checks to be performed:

(1) verify the general condition of the components and their packaging in relation to damages that could affect their integrity;

(2) verify that the shelf life of the component has not expired;

(3) verify that items are received in the appropriate package in respect of the type of the component: e.g. correct ATA 300 or electrostatic sensitive devices packaging, when necessary;

(4) verify that the component has all plugs and caps appropriately installed to prevent damage or internal contamination. Care should be taken when tape is used to cover electrical connections or fluid fittings/openings because adhesive residues can insulate electrical connections and contaminate hydraulic or fuel units.

(d) Items (fasteners, etc.) purchased in batches should be supplied in a package. The packaging should state the applicable specification/standard, part number, batch number, and the quantity of the items. The documentation that accompanies the material should contain the applicable specification/standard, part number, batch number, supplied quantity, and the manufacturing sources. If the material is acquired from different batches, acceptance documentation for each batch should be provided.

GM2 145.42(b)(i) Components

EXAMPLES OF SUPPLIERS

A supplier could be any source that provides components, standard parts or materials to be used for maintenance. Possible sources could be: Part-145 organizations, Part 21 Subpart G, operators, stockists, distributors, brokers, aircraft owners/lessees, etc.

GM3 145.42(b)(i) Components

SUPPLIER EVALUATION

(a) The following elements should be considered for the initial and recurrent evaluation of a supplier's quality system to ensure that the component and/or material is supplied in satisfactory condition:

(1) availability of appropriate up-to-date regulations, specifications (such as component handling/storage data) and standards;

(2) standards and procedures for the training of personnel and competency assessment;

(3) procedures for shelf-life control;

(4) procedures for handling of electrostatic sensitive devices;

(5) procedures for identifying the source from which components and materials were received;

(6) purchasing procedures that identify documentation to accompany components and materials for subsequent use by approved Part-145 maintenance organizations;

(7) procedures for incoming inspection of components and materials;

(8) procedures for control of measuring equipment that provide for appropriate storage, usage, and for calibration when such equipment is required;

(9) procedures to ensure appropriate storage conditions for components and materials that are adequate to protect the components and materials from damage and/or deterioration. Such procedures should comply with the manufacturers' recommendations and relevant standards;

(10) procedures for adequate packing and shipping of components and materials to protect them from damage and deterioration, including procedures for proper shipping of dangerous goods (e.g. ICAO and ATA specifications);

(11) procedures for detecting and reporting of suspected unapproved components;

(12) procedures for handling unsalvageable components in accordance with applicable regulations and standards;

(13) procedures for batch splitting or redistribution of lots and handling of the related documents;

(14) procedures for notifying purchasers of any components that have been shipped and have later been

identified as not conforming to the applicable technical data or standard;

(15) procedures for recall control to ensure that components and materials shipped can be traced and recalled if necessary;

(16) procedures for monitoring the effectiveness of the quality system.

(b) Suppliers which are certified to officially recognized standards that have a quality system that includes the elements specified in (a) may be acceptable; such standards include:

(1) EN/AS9120 and listed in the OASIS database;

(2) ASA-100;

(3) EASO 2012;

(4) FAA AC 00-56.

The use of such suppliers does not exempt the organization from its obligations under 145.42 to ensure that supplied components and materials are in satisfactory condition and meet the applicable criteria of 145.42.

(c) Supplier evaluation may depend on different factors, such as the type of component, whether or not the supplier is the manufacturer of the component, the TC holder or the declarant of a declaration of design compliance or a maintenance organization, or even specific circumstances such as aircraft on ground. This evaluation may be limited to a questionnaire from the Part-145 organization to its suppliers, a desktop evaluation of the supplier's procedures or an on-site audit, if deemed necessary.

GM1 145.42(b)(ii) Components

INSTALLATION OF COMPONENTS

Components, standard parts and materials should only be installed when they are specified in the applicable maintenance data as specified in 145.45(b). So, the installation of a component, standard part or material can only be done after checking the applicable maintenance data.

This check should ensure that the part number, modification status, limitations, etc., of the component, standard part or material are the ones specified in the applicable maintenance data of the particular aircraft or component where the component, standard part or material is going to be installed. The organization should establish procedures to ensure that this check is performed before installation.

AMC1 145.42(b)(iii) Components

FABRICATION OF PARTS FOR INSTALLATION

(a) The agreement of CARC on the fabrication of parts by the approved maintenance organization should be formalized through the approval of a detailed procedure in the Maintenance Organization Exposition (MOE). This AMC contains principles and conditions to be taken into account for the preparation of an acceptable procedure.

(b) Fabrication, inspection, assembly and test should be clearly within the technical and procedural capability of the organization.

(c) All necessary data to fabricate the part should be approved either by CARC or the type certificate (TC) holder, or Part 21 design organization approval holder, or supplemental type certificate (STC) holder, or should be declared by the declarant of a declaration of design compliance or, if applicable for a minor change, by a Part 21 design organization approval holder.

(d) Items that are fabricated by an organization approved under Part-145 may only be used by that organization in the course of overhaul, maintenance, modifications, or repair of aircraft or components, performing work at its own facilities. The permission to fabricate does not constitute approval for manufacture, or to supply externally, and the parts do not qualify for CARC FORM 18 OF-0227 certification. This prohibition also applies to the bulk transfer of surplus inventory, in that locally fabricated parts are physically segregated and excluded from any delivery certification.

(e) Fabrication of parts, modification kits, etc., for onward supply and/or sale may not be conducted by an organization that is approved under Part-145.

(f) The data specified in (c) may include repair procedures that involve the fabrication of parts. Where the data on such parts is sufficient to facilitate fabrication, the parts may be fabricated by an organization that is approved under Part-145. 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 and/or incoming inspection requirement, and that the approved organization has the necessary capability to fabricate those parts. That capability should be defined by way of exposition content. Where special processes or inspection procedures are defined in the approved or declared (in accordance with Part 21 Subpart C) data, which are not available at the organization, the organization cannot fabricate the part unless the TC/STC holder or the declarant of a declaration of design compliance gives an approved alternative.

(g) Examples of fabrication within the scope of a Part-145 approval may include but are not limited to the following:

(1) fabrication of bushes, sleeves and shims;

(2) fabrication of secondary structural elements and skin panels;

(3) fabrication of control cables;

(4) fabrication of flexible and rigid pipes;

(5) fabrication of electrical cable looms and assemblies;

(6) formed or machined sheet metal panels for repairs.

All the above-mentioned fabricated parts should be in accordance with the data provided in the overhaul or repair manuals, modification schemes and service bulletins, drawings, or should be otherwise approved by CARC.
Note: It is not acceptable to fabricate any item to pattern unless an engineering drawing of the item is produced which includes any necessary fabrication process and which is acceptable to CARC.

(h) Where a TC holder or declarant of a declaration of design compliance, or an approved or declared (in accordance with Part 21 Subpart G) production organization, or a production organization using Part 21 Subpart R is prepared to make available complete data which is not referred to in the aircraft manuals or service bulletins but provides manufacturing drawings for items specified in parts lists, the fabrication of these items is not considered to be within the scope of an approval unless agreed otherwise by CARC in accordance with a procedure specified in the exposition.

(i) Inspection and identification

Any locally fabricated part should be subject to inspection 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 or declared (in accordance with Part 21 Subpart C) data. Adequate records should be maintained of all such fabrication processes including heat treatment and final inspections. All parts, except those that do not have enough space, should carry a part number which clearly relates it to the manufacturing/inspection data. In addition to the part's number, the organization's identity should be marked on the part for traceability purposes.

AMC1 145.42(c) Components

SEGREGATION OF COMPONENTS

(a) Unserviceable components should be identified and stored in a secure location that is under the control of the maintenance organization until a decision is made on the future status of such components. The organization that declared the component to be unserviceable may transfer its custody after identifying it as unserviceable to the aircraft owner provided that such transfer is reflected in the aircraft logbook, or engine logbook, or component logbook.

(b) 'Secure location under the control of an approved maintenance organization' refers to a secure location whose security is the responsibility of the approved maintenance organization. This may include facilities that are established by the organization at locations different from the main maintenance facilities. These locations should be identified in the relevant procedures of the organization.

(c) In the case of unsalvageable components, the organization should:

(1) retain such component in the secure location referred to in paragraph (b);

(2) arrange for the component to be mutilated in a manner that ensures that they are beyond economic salvage or repair before disposing it; or

(3) mark the component indicating that it is unsalvageable, when in agreement with the component owner, the component is disposed of for legitimate non-flight uses (such as training and education aids, research and development), or for non-aviation applications, mutilation is often not appropriate. Alternatively, to marking, the original part number or data plate information can be removed or a record kept of the disposal of the components.

GM1 145.42(c)(i) Components

MUTILATION OF COMPONENTS

(a) Mutilation should be accomplished in such a manner that the components become permanently unusable for their originally intended use. Mutilated components should not be able to be reworked or camouflaged to provide the appearance of being serviceable, such as by replating, shortening and rethreading long bolts, welding, straightening, machining, cleaning, polishing, or repainting.

(b) Mutilation may be accomplished by one or a combination of the following procedures:

(1) grinding;

(2) burning;

(3) removal of a major lug or other integral feature;

(4) permanent distortion of parts;

(5) cutting a hole with cutting torch or saw;

(6) melting;

(7) sawing into many small pieces; and

(8) any other method accepted CARC.

(c) The following procedures are examples of mutilation that are often less successful because they may not be consistently effective:

(1) stamping or vibro-etching;

(2) spraying with paint;

(3) small distortions, incisions, or hammer marks;

(4) identification by tags or markings;

(5) drilling small holes; and

(6) sawing in two pieces only.

GM1 145.45(b) Maintenance data

The provisions of M.401, AMC M401(b) and AMC M.401(C), apply.

AMC1 145. 45(c) Maintenance data

1. The referenced procedure should ensure that when maintenance personnel discover inaccurate, incomplete or ambiguous information in the maintenance data, they should record the details as part of the internal safety reporting scheme specified in point 145.202. The procedure should then ensure that the Part-145 approved maintenance organization notifies the problem to the author of the maintenance data in a timely manner. A record of such communications to the author of the maintenance data should be retained by the Part-145 approved organization until such time as the author of the maintenance data has clarified the issue by e.g. amending the maintenance data.
2. The referenced procedure should be specified in the MOE.

AMC1 145.45(d) Maintenance data

The referenced procedure should address the need for a practical demonstration by the maintenance personnel proposing the change to the compliance monitoring personnel, of the modified maintenance instruction. Depending on the nature of the maintenance instruction modification, a risk assessment may be required to demonstrate that an equivalent or improved maintenance standard is reached. When satisfied, the compliance monitoring personnel should approve the modified maintenance instruction, and ensure that the author of the maintenance instruction is informed of the modified maintenance instruction. The procedure should include a paper/electronic traceability of the complete process from start to finish, and ensure that the relevant maintenance instruction
clearly identifies the modification. Modified maintenance instructions should only be used in the following circumstances:

(a) Where the original intent of the maintenance instruction can be carried out in a more practical or more efficient manner.

(b) Where the original intent of the maintenance instruction cannot be achieved when following the maintenance instructions. For example, where a component cannot be replaced following the original maintenance instructions.

(c) For the use of alternative tools / equipment.

Important Note: Critical Design Configuration Control Limitations (CDCCL) are airworthiness limitations. Any modification of the maintenance instructions linked to CDCCL constitutes a change to a (restricted) type certificate that should be approved in accordance with Part 21.

AMC1 145.45(e) Maintenance data

1. 'The relevant parts of the organization' means, as appropriate, aircraft base maintenance, aircraft line maintenance, specialized services, component workshops such as engine workshops, mechanical workshops or avionics workshops. Therefore, a common system should be used, for example, throughout the engine workshops, which may be different from that in the aircraft base maintenance.
2. The work cards should differentiate and specify, when relevant, disassembly, accomplishment of tasks, reassembly and testing as well as the error-capturing method (e.g. independent inspection). In the case of a lengthy maintenance task involving a succession of personnel to complete such a task, it may be necessary to use supplementary work cards or worksheets to indicate what was actually accomplished by each individual person.
3. With reference to point 145.65(a), human factors should be taken into account during the development of work cards and worksheets.
4. 'Complex or long maintenance tasks' refers to tasks involving multiple disciplines or multiple shifts, or multiple zones/access opening, special tools, etc., or a combination of these.

   The stages into which the work cards are to be subdivided should refer to where work can be interrupted. Subdivision should also indicate when a different discipline continues to work if no separate work cards are provided.

5. Where required by the operator CAMO to use their work card or worksheet system, the maintenance organization should assess the system for compliance with the maintenance organization procedures, for example, the subdivision of complex or long maintenance tasks.

AMC 145.45(f) Maintenance data

1. Data being made available to personnel maintaining aircraft means that the data should be available in close proximity to the aircraft being maintained for supervisors, mechanics and certifying staff to study.
2. Where computer systems are used, the number of computer terminals should be sufficient in relation to the size of the work program to enable easy access, unless the computer system can produce paper copies. Where microfilm or microfiche readers/printers are used, a similar requirement is applicable.

AMC1 145.45(g) Maintenance data

To keep data up-to-date, a procedure should be set up to monitor the amendment status of all data and maintain a check that all amendments are being received by being a subscriber to any document amendment scheme. Special attention should be given to mandatory instructions and associated airworthiness limitations published by design approval holders or the declarant of a declaration of design compliance.

AMC 145.47(a) Production planning

1. Depending on the amount and complexity of work generally performed by the maintenance organization, the planning system may range from a very simple procedure to a complex organizational set-up including a dedicated planning function in support of the production function.

2. For the purpose of Part-145, the production planning function includes two complementary elements:

   - scheduling the maintenance work ahead, to ensure that it will not adversely interfere with other work as regards the availability of all necessary personnel, tools, equipment, material, maintenance data and facilities.
   - during maintenance work, organizing maintenance teams and shifts and provide all necessary support to ensure the completion of maintenance without undue time pressure.

3. When establishing the production planning procedure, consideration should be given to the following:

   - logistics,
   - inventory control,
   - square meters of accommodation,
   - man-hours estimation,
   - man-hours availability,
   - preparation of work,
   - hangar availability,
   - environmental conditions (access, lighting standards and cleanliness),
   - co-ordination with internal and external suppliers, etc.
   - scheduling critical maintenance tasks during periods when staff are likely to be most alert.

AMC1 145.47(b) Production planning

CONSIDERATION OF FATIGUE IN THE PLANNING OF MAINTENANCE

(a) The way and the extent to which the organization should consider the threat of fatigue in the planning of tasks and organizing of shifts will vary from one organization to another and from one maintenance event to another, depending on what maintenance is to be carried out, how, where, when and by whom.

(b) Fatigue is one example of human factors issues which should be taken into account by the management system, particularly for the planning activity. In this respect, where the organization activity is prone to fatigue issues, the organization should:

(1) ensure that the safety policy required by point 145.200(a) gives due consideration to the aspects of fatigue;

(2) ensure that the internal safety reporting scheme required by point 145.202 enables the collection of fatigue issues;

(3) ensure that the threat of fatigue is adequately taken into account by the management system key processes (e.g. assessment, management, monitoring);

(4) provide safety promotion material and adapt safety training accordingly.

(c) The organizing of shifts should consider good practices in the maintenance domain and applicable rules. The resulting shift schedule should be shared with the maintenance staff sufficiently in advance so they can plan adequate rest.

The established shift durations should not be exceeded merely for management convenience even when staff is willing to work extended hours.

(d) The organization should have a procedure (including mitigations) to address cases where the working hours are to be significantly increased, or when the shift pattern is to be significantly modified, such as for urgent operational reasons. In cases not covered by that procedure, the organization should perform a specific risk assessment and define additional mitigation actions, as applicable. Basic mitigations may include:

(1) additional supervision and independent inspection;

(2) limitation of maintenance tasks to non-critical tasks;

(3) use of additional rest breaks.

GM1 145.47(b) Production planning

CONSIDERATION OF FATIGUE IN THE PLANNING OF MAINTENANCE

(a) Fatigue may be induced by:

(i) the environment and conditions (e.g. noise, humidity, temperature, closed section, working overhead) in which the work is carried out;

(ii) excessive hours of duty and shift working, particularly with multiple shift periods or patterns, additional overtime or night work;

(iii) travel to the maintenance location (e.g. jetlag, duration)

Fatigue is one of the factors that may contribute towards maintenance errors when it is not properly considered as part of planning activities.

(b) Taking into account the threat of fatigue in the planning of maintenance tasks and organizing of shifts refers to setting up the maintenance and the shifts in a way that enables the maintenance staff to remain sufficiently free from fatigue so they can perform the planned maintenance safely, including:

- providing rest periods of sufficient time to overcome the effects of the previous shift and to be rested by the start of the following shift;
- avoiding shift patterns that cause a serious disruption of an established sleep/work pattern, such as alternating day/night duties;
- planning recurrent extended rest periods and notifying staff sufficiently in advance.

AMC 145.47(c) Production planning

The primary objective of the changeover / handover information is to ensure effective communication at the point of handing over the continuation or completion of maintenance actions. Effective task and shift handover depends on three basic elements:

- The outgoing person's ability to understand and communicate the important elements of the job or task being passed over to the incoming person.
- The incoming person's ability to understand and assimilate the information being provided by the outgoing person.
- A formalized process for exchanging information between outgoing and incoming persons and a planned shift overlap and a place for such exchanges to take place.

GM1 145.47(d) Production planning

'External working teams' refers to an organization that does not belong to the Part-145 organization in whose facility the maintenance is being carried out, and which is, for example (this list is not exhaustive):

- contracted by the Part-145 maintenance organization; or
- subcontracted by the Part-145 maintenance organization; or
- contracted by the person or organization responsible for the aircraft continuing airworthiness.

The objective of point 145.47(d) is to manage the risk involved in the actual execution of maintenance by the various organizations at the same location.

Example: The need for one organization to be informed that they should not put the aircraft in a certain configuration (regarding, for instance, electrical power) if this is could contribute to an error in the maintenance performed by another organization.

Note: Refer to GM2 145.205 for the difference between contracting and subcontracting maintenance activities.

GM 145.48 Performance of maintenance

AUTHORISED PERSON

An 'authorized person' is a person formally authorized by the maintenance organization to perform or supervise a maintenance task. An 'authorized person' is not necessarily 'certifying staff'.

SIGN-OFF

A 'sign-off' is a statement issued by the 'authorized person' which indicates that the task or group of tasks has been correctly performed. A 'sign-off' relates to one step in the maintenance process and is, therefore, different to a certificate of release to service.

AMC1 145.48(a) Performance of maintenance

Point (a) of 145.48 is intended to cover the situation where the organization may temporarily not hold all the necessary tools, equipment, material, maintenance data, etc. for an aircraft type or variant, or component specified in the organization's scope of work. This point means that CARC need not amend the approval to delete the aircraft type or variants, or component on the basis that it is a temporary situation and there is a commitment from

the organization to re-acquire tools, equipment etc. before maintenance on the related aircraft or component may recommence.

GM1 145.48(c) Performance of maintenance

CRITICAL DESIGN CONFIGURATION CONTROL LIMITATIONS (CDCCL)

The organization should ensure that when performing maintenance the CDCCL are not compromised. The organization should pay particular attention to possible adverse effects of any change to the wiring of the aircraft, even of a change not specifically associated with the fuel tank system. For example, it should be common practice to identify the segregation of fuel gauging system wiring as a CDCCL. The organization can prevent adverse effects associated with changes to the wiring by standardizing maintenance practices through training, and not through periodic inspections. Training should be provided to avoid indiscriminate routing and splicing of wires and to provide comprehensive knowledge of critical design features of fuel tank systems that would be controlled by a CDCCL. Guidance on the training of maintenance organization personnel is provided in Appendix IV to AMC5 145.30(e).

AMC1 145.48(c)(2) Performance of maintenance

The organization should have a procedure to identify the error-capturing methods, the critical maintenance tasks, the training and the qualifications of staff applying error-capturing methods, and how the organization ensures that its staff is familiar with critical maintenance tasks and error- capturing methods.

AMC2 145.48(c) (2) Performance of maintenance

CRITICAL MAINTENANCE TASKS

(a) The procedure should ensure that the following maintenance tasks are reviewed to assess their impact on flight safety:

(1) tasks that may affect the control of the aircraft flight path and attitude, such as installation, rigging and adjustments of flight controls;

(2) aircraft stability control systems (autopilot, fuel transfer);

(3) tasks that may affect the propulsive force of the aircraft, including installation of aircraft engines, propellers and rotors; and

(4) overhaul, calibration or rigging of engines, propellers, transmissions and gearboxes.

(b) The procedure should describe which data sources are used to identify critical maintenance tasks. Several data sources may be used, such as:

(1) information from the design approval holder or the declarant of a declaration of design compliance;

(2) accident reports;

(3) investigation and follow-up of incidents;

(4) occurrence reporting;

(5) flight data analysis, where this is available from the person or organization responsible for the aircraft continuing airworthiness;

(6) results of audits and independent inspections;

(7) monitoring schemes for normal operations, where these are available from the person or organization responsible for the aircraft continuing airworthiness;

(8) feedback from training.

AMC3 145.48(c) (2) Performance of maintenance

ERROR-CAPTURING METHODS

(a) Error-capturing methods are those actions defined by the organization to detect maintenance errors that are made while performing maintenance.

(b) The organization should ensure that the error-capturing methods are adequate for the work and the disturbance of the system. A combination of several actions (e.g. visual inspection, operational check, functional test, rigging check) may be necessary in some cases.

AMC4 145.48(c) (2) Performance of maintenance

INDEPENDENT INSPECTION

Independent inspection is one possible error-capturing method.

(a) What is an independent inspection

An independent inspection is an inspection performed by an 'independent qualified person' of a task carried out by an 'authorized person', taking into account that:

(1) the 'authorized person' is the person who performs the task or supervises the task and they assume the full responsibility for the completion of the task in accordance with the applicable maintenance data;

(2) the 'independent qualified person' is the person who performs the independent inspection and attests the satisfactory completion of the task and that no deficiencies have been found. The 'independent qualified person' does not issue a certificate of release to service, therefore they are not required to hold certification privileges;

(3) the 'authorized person' issues the certificate of release to service or signs off the completion of the task after the independent inspection has been carried out satisfactorily;

(4) the work card system used by the organization should record the identification of both persons and the details of the independent inspection as necessary before the certificate of release to service or sign-off for the completion of the task is issued.

(b) Qualifications of persons performing independent inspections

The organization should have procedures to demonstrate that the 'independent qualified person' has been trained and has gained experience in the specific inspection to be performed. The organization could consider making use of, for example:

(1) staff holding a certifying staff or support staff or sign-off authorization or equivalent necessary to release or sign off the critical maintenance task;

(2) staff holding a certifying staff or support staff or sign-off authorization or equivalent necessary to release or sign off similar task in a product of similar category and having received specific practical training in the task to be inspected; or

(3) a commander holding a limited certification authorization in accordance with 145.30(j)(4) and having received adequate practical training and having enough experience in the specific task to be inspected and on how to perform independent inspection.

(c) How to perform an independent inspection

An independent inspection should ensure correct assembly, locking and sense of operation. When inspecting control systems that have undergone maintenance, the independent qualified person should consider the following points independently:

(1) all those parts of the system that have actually been disconnected or disturbed should be inspected for correct assembly and locking;

(2) the system as a whole should be inspected for full and free movement over the complete range;

(3) cables should be tensioned correctly with adequate clearance at secondary stops;

(4) the operation of the control system as a whole should be observed to ensure that the controls are operating in the correct sense;

(5) if different control systems are interconnected so that they affect each other, all the interactions should be checked through the full range of the applicable controls; and

(6) software that is part of the critical maintenance task should be checked, for example: version, compatibility with aircraft configuration.

(d) What to do in unforeseen cases when only one person is available REINSPECTION:

(1) Reinspection is an error-capturing method subject to the same conditions as an independent inspection is, except that the 'authorized person' performing the maintenance task is also acting as 'independent qualified person' and performs the inspection.

(2) Reinspection, as an error-capturing method, should only be performed in unforeseen circumstances when only one person is available to carry out the task and perform the independent inspection. The circumstances cannot be considered unforeseen if the person or organization has not assigned a suitable 'independent qualified person' to that particular line station or shift.

(3) The certificate of release to service is issued after the task has been performed by the 'authorized person' and the reinspection has been carried out satisfactorily. The work card system used by the organization should record the identification and the details of the reinspection before the certificate of release to service for the task is issued.

AMC1 145.48(c)(3) Performance of maintenance

The procedures should be aimed at:

(a) minimizing errors and preventing omissions. Therefore, the procedures should specify:

(1) that every maintenance task is signed off only after completion;

(2) how the grouping of tasks for the purpose of sign-off allows critical steps to be clearly identified; and

(3) that work performed by personnel under supervision (i.e. temporary staff, trainees) is checked and signed off by an authorized person;

(b) minimizing the possibility of an error being repeated in identical tasks and, therefore, compromising more than one system or function. Thus, the procedures should ensure that no person is required to perform a maintenance task involving removal/installation or assembly/disassembly of several components of the

same type fitted to more than one system, a failure of which could have an impact on safety, on the same aircraft or component during a particular maintenance check. However, in unforeseen circumstances when only one person is available, the organization may make use of reinspection as described in point (d) of AMC4 145.48(c)(2).

GM1 145.48(c)(3) Performance of maintenance

To minimize the risk of errors during maintenance and the risk of errors being repeated in identical maintenance tasks, the organization may implement:

- procedures to plan the performance by different persons of the same task in different systems;
- independent inspection or re-inspection procedures.

AMC 145.50 Certification of maintenance after embodiment of a Standard Change or Standard Repair (SC/SR)

AMC M.801 of the AMC to Part-M contain acceptable means of compliance for the release to service of a SC/SR by an organization approved in accordance with Part-145.

GM1 145. 50(a) Certification of maintenance

'Endanger flight safety' means any instances where safe operation could not be assured, or which could lead to an unsafe condition. These typically include, but are not limited to, significant cracking, deformation, corrosion or failure of primary structure, any evidence of burning, electrical arcing, significant hydraulic fluid or fuel leakage, and any emergency system or total system failure. An airworthiness directive that is overdue for compliance is also considered to be a hazard to flight safety.

However, the intent is not to require the maintenance organization to find or become responsible for hidden non-compliances which are not expected to be discovered during the ordered maintenance.

A certificate of release to service issued by a maintenance organization certifies that the performed maintenance work, as agreed in the work order or the contract, has been completed in accordance

with the applicable requirements and the maintenance organization's approved procedures. In the case of aircraft maintenance, it does not necessarily mean that the aircraft is in airworthy condition. Ensuring that the aircraft is airworthy before each flight always remains the responsibility of the person or organization managing the aircraft continuing airworthiness.

AMC 145.50(b) Certification of maintenance

1. The certificate of release to service should contain the following statement:

'Certifies that the work specified, except as otherwise specified, was carried out in accordance with Part-145 and in respect to that work the aircraft/aircraft component is considered ready for release to service'.

Reference should also be made to CARC Part-145 approval number and the identity of the person who issued the release.

2. It is acceptable to use an alternate abbreviated certificate of release to service consisting of the following statement 'Part-145 release to service' instead of the full certification statement specified in paragraph 1. When the alternate abbreviated certificate of release to service is used, the introductory section of the technical log should include an example of the full certification statement from paragraph 1.

3. The certificate of release to service should relate to the task specified in the instructions issued by the (S)TC holder or the declarant of a declaration of design compliance or operator or in the aircraft maintenance program which itself may cross-refer to maintenance data.

4. The date such maintenance was carried out should include when the maintenance took place relative to any life or overhaul limitation in terms of date/flying hours/cycles/landings etc., as appropriate.

5. When extensive maintenance has been carried out, it is acceptable for the certificate of release to service to summarize the maintenance as long as there is a unique cross-reference to the work package containing full details of maintenance carried out. Dimensional information should be retained in the work-pack record.

AMC1 145. 50(d) Certification of maintenance

The purpose of the certificate is to certify maintenance work carried out on assemblies/items/components/parts (hereafter referred to as 'item(s)'). It also allows the removal from aircraft of items in a 'serviceable' condition in accordance with AMC2 145.50(d) in order to fit them to another aircraft/aircraft component.

The certificate is to be used for export/import purposes, as well as for domestic purposes, and serves as an official certificate for items from the manufacturer/maintenance organization to users.

It can only be issued by organizations approved by the particular competent authority within the scope of the approval.

The certificate may be used as a rotatable tag by utilizing the available space on the reverse side of the certificate for any additional information and dispatching the item with two copies of the certificate so that one copy may be eventually returned with the item to the maintenance organization. The alternative solution is to use existing rotatable tags and also supply a copy of the certificate.

A certificate should not be issued for any item when it is known that the item is unserviceable except in the case of an item undergoing a series of maintenance processes at several maintenance organizations approved under

Part-145 and the item needs a certificate for the previous maintenance process carried out for the next maintenance organization approved under Part-145 to accept the item for subsequent maintenance processes. In such a case, a clear statement of limitation should be endorsed in Block 12.

AMC2 145.50(d) Certification of maintenance

1. A component which has been maintained off the aircraft needs the issuance of a certificate of release to service for such maintenance and another certificate of release to service in regard to being installed properly on the aircraft when such action occurs.

   When an organization maintains a component for use by the same organization, CARC Form 18 OF-0227 may not be necessary depending upon the organization's internal release procedures defined in the maintenance organization exposition.

2. In the case of the issue of CARC Form 18 OF-0227 for components in storage before Part-145 and Part-21 became effective and not released on an CARC Form 18 OF-0227 or equivalent in accordance with 145.42(a) or removed serviceable from a serviceable aircraft or an aircraft which has been withdrawn from service the following applies:

   2.1 A CARC Form 18 OF-0227 may be issued for an aircraft component which has been:

   - Maintained before Part-145 became effective or manufactured before Part-21 became effective.
   - Used on an aircraft and removed in a serviceable condition. Examples include leased and loaned aircraft components.
   - Removed from aircraft which have been withdrawn from service, or from aircraft which have been involved in abnormal occurrences such as accidents, incidents, heavy landings or lightning strikes.
   - Maintained by an unapproved organization.

   2.2 An appropriately rated maintenance organization approved under Part-145 may issue CARC Form 18 OF-0227 as detailed in this AMC subparagraph 2.5 to 2.9, as appropriate, in accordance with procedures detailed in the exposition as approved by CARC. The appropriately rated organization is responsible for ensuring that all reasonable measures have been taken to ensure that only approved and serviceable aircraft components are issued CARC Form 18 OF-0227 under this paragraph.

   2.3 For the purposes of this AMC No 2 only, appropriately rated means an organization with an approval class rating for the type of component or for the product in which it may be installed.

   2.4 A CARC Form 18 OF-0227 issued in accordance with this paragraph 2 should be issued by signing in block 14b and stating 'Inspected/Tested' in block 11. In addition, block 12 should specify:

   2.4.1 When the last maintenance was carried out and by whom.

   2.4.2 If the component is unused, when the component was manufactured and by whom with a cross-reference to any original documentation which should be included with the Form.

2.4.3 A list of all airworthiness directives, repairs and modifications known to have been incorporated. If no airworthiness directives or repairs or modifications are known to be incorporated, then this should be so stated.

2.4.4 Detail of life used for life-limited parts and time-controlled components being any combination of fatigue, overhaul or storage life.

2.4.5 For any aircraft component having its own maintenance history record, reference to the particular maintenance history record as long as the record contains the details that would otherwise be required in block 12. The maintenance history record and acceptance test report or statement, if applicable, should be attached to the **CARC Form 18 OF-0227**.

2.5 New/unused aircraft components

2.5.1 Any unused aircraft component in storage without CARC Form 18 OF-0227 up to the effective date(s) for Part-21 that was manufactured by an organization acceptable to CARC at that time may be issued with CARC Form 18 OF-0227 by an appropriately rated maintenance organization approved under Part-145. The CARC Form 18 OF-0227 should be issued in accordance with the following subparagraphs, which should be included in a procedure within the maintenance organization manual.

Note 1: It should be understood that the release of a stored but unused aircraft component in accordance with this paragraph represents a maintenance release under Part-145 and not a production release under Part-21. It is not intended to bypass the production release procedure for parts and subassemblies intended for fitment on the manufacturers' own production line.

(a) An acceptance test report or statement should be available for all used and unused aircraft components that are subjected to acceptance testing after manufacturing or maintenance as appropriate.

(b) The aircraft component should be inspected for compliance with the manufacturer's instructions and limitations for storage and condition including any requirement for limited storage life, inhibitors, controlled climate and special storage containers. In addition or in the absence of specific storage instructions the aircraft component should be inspected for damage, corrosion and leakage to ensure good condition.

(c) The storage life used of any storage life-limited parts should be established.

2.5.2 If it is not possible to establish satisfactory compliance with all applicable conditions specified in subparagraph 2.5.1(a) to (c) inclusive, the aircraft component should be disassembled by an appropriately rated organization and subjected to a check for incorporated airworthiness directives, repairs and modifications and inspected/tested in accordance with the maintenance data to establish satisfactory condition and, if relevant, all seals, lubricants and life-limited parts should be replaced. Upon satisfactory completion after reassembly, a CARC Form 18 OF-0227 may be issued stating what was carried out and the reference of the maintenance data included.

2.6 Used aircraft components removed from a serviceable aircraft

2.6.1 Serviceable aircraft components removed from the Competent Authority registered aircraft may be issued with a CARC FORM 18 OF-0227 by an appropriately rated organization subject to compliance with this subparagraph.

(a) The organization should ensure that the component was removed from the aircraft by an appropriately qualified person.

(b) The aircraft component may only be deemed serviceable if the last flight operation with the component fitted revealed no faults on that component/related system.

(c) The aircraft component should be inspected for satisfactory condition including in particular damage, corrosion or leakage and compliance with any additional maintenance data.

(d) The aircraft record should be researched for any unusual events that could affect the serviceability of the aircraft component such as involvement in accidents, incidents, heavy landings or lightning strikes. Under no circumstances may CARC Form 18 OF-0227 be issued in accordance with this paragraph 2.6 if it is suspected that the aircraft component has been subjected to extremes of stress, temperatures or immersion which could affect its operation.

(e) A maintenance history record should be available for all used serialized aircraft components.

(f) Compliance with known modifications and repairs should be established.

(g) The flight hours/cycles/landings as applicable of any life-limited parts and time-controlled components including time since overhaul should be established.

(h) Compliance with known applicable airworthiness directives should be established.

(i) Subject to satisfactory compliance with this subparagraph 2.6.1, CARC Form 18 OF-0227 may be issued and should contain the information as specified in paragraph 2.4 including the aircraft from which the aircraft component was removed.

2.6.2 Serviceable aircraft components removed the Competent Authority registered aircraft may also be issued with a CARC Form 18 OF-0227 if the components are leased or loaned from the maintenance organization approved under Part-145 who retains control of the airworthiness status of the components. A CARC Form 18 OF-0227 may be issued and should contain the information as specified in paragraph 2.4 including the aircraft from which the aircraft component was removed.

2.7 Used aircraft components removed from an aircraft withdrawn from service. Serviceable aircraft components removed from the Competent Authority registered aircraft withdrawn from service may be issued with a CARC Form 18 OF-0227 by a maintenance organization approved under Part-145 subject to compliance with this subparagraph.

(a) Aircraft withdrawn from service are sometimes dismantled for spares. This is considered to be a maintenance activity and should be accomplished under the

control of an organization approved under Part-145, employing procedures approved by CARC.

(b) To be eligible for installation, components removed from such aircraft may be issued with a CARC Form 18 OF-0227 by an appropriately rated organization following a satisfactory assessment.

(c) As a minimum, the assessment will need to satisfy the standards set out in paragraphs 2.5 and 2.6 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 program applicable to the aircraft on which the component is to be installed.

(d) Irrespective of whether the aircraft holds a certificate of airworthiness or not, the organization responsible for certifying any removed component should ensure that the manner in which the components were removed and stored are compatible with the standards required by Part-145.

(e) A structured plan should be formulated to control the aircraft disassembly process. The disassembly is to be carried out by an appropriately rated organization 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.

(f) 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.

(g) 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.

(h) Suitable Part-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.

2.8 Used aircraft components maintained by organizations not approved in accordance with Part-145. For used components maintained by a maintenance organization not approved under Part-145, due care

should be taken before acceptance of such components. In such cases an appropriately rated maintenance organization approved under Part-145 should establish satisfactory conditions by:

(a) dismantling the component for sufficient inspection in accordance with the appropriate maintenance data;

(b) replacing all life-limited parts and time-controlled components when no satisfactory evidence of life used is available and/or the components are in an unsatisfactory condition;

(c) reassembling and testing as necessary the component;

(d) completing all certification requirements as specified in 145.50.

2.9 Used aircraft components removed from an aircraft involved in an accident or incident. Such components should only be issued with a CARC Form 18 OF-0227 when processed in accordance with paragraph 2.7 and a specific work order including all additional necessary tests and inspections deemed necessary by the accident or incident. Such a work order may require input from the TC holder or the declarant of a declaration of design compliance or original manufacturer as appropriate. This work order should be referenced in block 12.

GM 145.50(d) CARC Form 18 OF-0227 Block 12 'Remarks'

- Maintenance documentation used, including the revision status, for all work performed and not limited to the entry made in block 11.
- A statement such as 'in accordance with the CMM' is not acceptable.
- NDT methods with appropriate documentation used when relevant.
- Compliance with airworthiness directives or service bulletins.
- Repairs carried out.
- Modifications carried out.
- Replacement parts installed.
- Life-limited parts status.
- Shelf life limitations.
- Deviations from the customer work order.
- Release statements to satisfy a foreign Civil Aviation Authority maintenance requirement.
- Information needed to support shipment with shortages or re-assembly after delivery.
- References to aid traceability, such as batch numbers.

AMC1 145.50(e) Certification of maintenance

1. Being unable to establish full compliance with point 145.50(a) means that the maintenance required by the person or organization responsible for the aircraft continuing airworthiness could not be completed due to either running out of available aircraft maintenance downtime for the scheduled check, or by virtue of the condition of the aircraft requiring additional maintenance downtime, or because the maintenance data requires a flight to be performed as part of the maintenance, as described in paragraph 4.

2. The person or organization responsible for the aircraft continuing airworthiness is responsible for ensuring that all required maintenance has been carried out before flight and therefore 145.50(e) requires such person or organization to be informed in the case where full compliance with 145.50(a) cannot be achieved within the relevant limitations. If that person

   or organization agrees to the deferment of full compliance, then the certificate of release to service may be issued subject to details of the deferment, including the competent authority of the State of Registry, being endorsed on the certificate.

   Note: Whether or not the person or organization responsible for the aircraft continuing airworthiness does have the authority to defer maintenance is an issue between that person or organization and the competent authority of the State of Registry. In case of doubt concerning such a decision, the approved maintenance organization should inform CARC of such doubt, before issuing the certificate of release to service. This will allow CARC to investigate the matter with the competent authority of the State of Registry or the State of the operator as appropriate.

3. The procedure should draw attention to the fact that 145.50(a) does not normally permit the issue of a certificate of release to service in the case of non-compliance and should state what action the mechanic, supervisor and certifying staff should take to bring the matter to the attention of the relevant department or person responsible for technical co-ordination with the person or organization responsible for the aircraft continuing airworthiness so that the issue may be discussed and resolved with that person or organization. In addition, the appropriate person(s) as specified in point 145.30(b) should be kept informed in writing of such possible non-compliance situations and this should be included in the procedure.

4. Certain maintenance data issued by the design approval holder or the declarant of a declaration of design compliance (e.g. aircraft maintenance manual (AMM)) requires that a maintenance task be performed in flight as a necessary condition to complete the maintenance ordered. Within the aircraft limitations, an appropriately authorized certifying staff should release the incomplete maintenance before the flight on behalf of the maintenance organization. GM M.301(i) describe the relations with the aircraft operator, which retains the responsibility for the maintenance check flight (MCF). After performing the flight and any additional maintenance necessary to complete the maintenance ordered, a certificate of release to service should be issued in accordance with 145.50(a).

AMC1 145.50(f) Certification of maintenance

1. Suitable release certificate means a certificate which clearly states that the aircraft component is serviceable; that clearly specifies the organization releasing said component together with details of the authority under whose approval the organization works including the approval or authorization reference.

2. 'Compliance with all applicable maintenance and operational requirements' means, in particular, making an appropriate entry in the aircraft continuing airworthiness record system or if applicable, in the aircraft technical log system, checking the compatibility of the component with the aircraft approved design, including modifications, repairs, airworthiness directives, life limitations and condition of the aircraft component plus information on where, when and why the aircraft was grounded.

AMC1 145.55 Record-keeping

GENERAL

(a) The record-keeping system should ensure that all records are accessible within a reasonable time whenever they are needed. These records should be organized in a manner that ensures their traceability and retrievability throughout the required retention period.

(b) Records should be kept in paper form, or in electronic format, or a combination of the two. Records that are stored on microfilm or in optical disc formats are also acceptable. The records should remain legible throughout the required retention period. The retention period starts when the record is created or was last amended.

(c) Paper systems should use robust materials which can withstand normal handling and filing. Computer record systems should have at least one backup system, which should be updated within 24 hours of any new entry. Computer record systems should include safeguards to prevent unauthorized personnel from altering the data.

(d) All computer hardware that is used to ensure the backup of data should be stored in a different location from the one that contains the working data, and in an environment that ensures that the data remains in a good condition. When hardware or software changes take place, special care should be taken to ensure that all the necessary data continues to be accessible through at least the full period specified in the relevant provision. In the absence of any such indications, all records should be kept for a minimum period of 3 years.

GM1 145.55 Record-keeping

RECORDS

Microfilming or optical storage of records may be carried out at any time. The records should be as legible as the original record, and remain so for the required retention period.

GM1 145.55(a)(1) Record-keeping

MAINTENANCE RECORDS

1. Properly executed and retained maintenance records provide:

   (i) owners and persons or organizations responsible for aircraft continuing airworthiness with information essential in establishing the airworthiness status of aircraft or component, and in particular, in controlling unscheduled and scheduled maintenance;

   (ii) maintenance personnel with information essential for troubleshooting eliminating the need for re-inspection and rework.

   The prime objective is to have secure and easily retrievable records with comprehensive and legible contents. The aircraft record should contain basic details of all serialized aircraft components and all other significant aircraft components installed during the maintenance performed, to ensure traceability to such installed aircraft component documentation, associated maintenance data and data for modifications and repairs.

2. Some gas turbine engines are assembled from modules, and a true total time in service for a total engine is not kept. When it is desirable to take advantage of the modular design, then the total time in service and the maintenance records for each module are to be maintained. The maintenance records as specified are to be kept with the module and should show compliance with any mandatory requirements pertaining to that module.

AMC1 145.55(a) (3) Record-keeping

'Associated maintenance data' refers to specific information such as data pertaining to embodiment of a repair or modification data. This does not necessarily require the retention of all Aircraft Maintenance Manual, Component Maintenance Manual, IPC, etc. issued by the TC holder, the STC holder or the declarant of a declaration of design compliance. Maintenance records should refer to the revision status of the data used.

AMC1 145.55 (d) Record-keeping

RECORDS OF CERTIFYING STAFF AND SUPPORT STAFF

1. The following minimum information, as applicable, should be kept on record in respect of certifying staff or support staff:

(a) Name;

(b) Date of birth;

(c) Basic training;

(d) Task training or product/type training;

(e) Recurrent training;

(f) Experience;

(g) Qualifications relevant to the authorization;

(h) Scope of the authorization (role, product, level of maintenance, etc.);

(i) Date of first issue of the authorization;

(j) Expiry date of the authorization (if appropriate); and

(k) Identification number of the authorization.

2. The record may be kept in any format but should be controlled by the organization's compliance monitoring function. This does not mean that the compliance monitoring manager should run the record system.

3. The number of persons authorized to access the system should be kept to a minimum to ensure that records cannot be altered in an unauthorized manner, and that such confidential records do not become accessible to any unauthorized persons.

4. CARC is authorized to access personal records when investigating the records system for initial certification and oversight, or when CARC has cause to doubt the competency of a particular person.

5. The organization is required to furnish each of the certifying staff, support staff, airworthiness review staff, technical staff etc. a copy of their personal detailed records on leaving the organization including experience details, experience logbook, training, scope of work authorization, qualifications relevant to authorization, certificates, details of tasks accomplished (date, A/C Type, AMM/CMM, modifications, repairs, ATA chapter) .

AMC2 145.55(d) Record-keeping

RECORDS OF AIRWORTHINESS REVIEW STAFF

The following minimum information, as applicable, should be kept on record in respect of each airworthiness review staff:

(a) Name;

(b) Date of birth;

(c) Certifying staff authorization;

(d) Experience as certifying staff on aircraft covered by 145.37,;

(e) Qualifications relevant to the approval (knowledge of relevant parts of Part M, and knowledge of the relevant airworthiness review procedures);

(f) Scope of the airworthiness review authorization and personal authorization reference;

(g) Date of the first issue of the airworthiness review authorization; and

(h) Expiry date of the airworthiness review authorization (if appropriate).

AMC1 145.60 Occurrence reporting

GENERAL

(a) Where the organization holds one or more additional organization certificates issued by CARC.

(1) the organization may establish an integrated occurrence reporting system covering all certificate(s) held; and

(2) single reports for occurrences should only be provided if the following conditions are met:

the report includes all relevant information from the perspective of the different organization certificates held;

(i) the report addresses all relevant specific mandatory data fields and clearly identifies all certificate holders for which the report is made; and

(ii) all certificates are issued by CARC and such single reporting was agreed with CARC.

(b) The organization should assign responsibility to one or more suitably qualified persons with clearly defined authority, for coordinating action on airworthiness occurrences and for initiating any necessary further investigation and follow-up activity.

(c) If more than one person are assigned such responsibility, the organization should identify a single person to act as the main focal point for ensuring that a single reporting channel is established to the accountable manager. This should in particular apply to organizations holding one or more additional organization certificates **issued by CARC** where the occurrence reporting system is fully integrated with that required under the additional certificate(s) held.

AMC1 145.60 (a) Occurrence reporting

Technical Occurrence Reporting Guidance Procedure AWS 30 provides further guidance on occurrence reporting.

GM1 145.60 (a) Occurrence reporting

The organization responsible for the design is normally the TC holder of the aircraft, engine or propeller and/or if known the STC holder.

AMC2 145.60 Occurrence reporting

The organization should share relevant safety-related occurrence reports with the design approval holder or the declaration of a declaration of design compliance of the aircraft or component in order to enable it to issue appropriate service instructions and recommendations to all relevant parties. Liaison with the design approval holder or the declarant of a declaration of design compliance is recommended to establish whether published or proposed service information will resolve a problem or to obtain a solution to a particular problem.

GM1 145.60 Occurrence reporting

MANDATORY REPORTING — GENERAL

(a) For organizations having their principal place of business in Jordan, refer to CARC Technical Occurrence Reporting Guidance Procedure AWS 30.This list should not be understood as being an exhaustive collection of all issues that may pose a significant risk to aviation safety and therefore reporting should not be limited to items listed in AWS 30.

(b) EASA AMC-20 which is adopted by CARC according to JCAR Part-CS 'General Acceptable Means of Compliance for Airworthiness of Products, Parts and Appliances' provides further details on occurrence reporting (EASA AMC 20-8A).

GM1 145.60(b) Occurrence reporting

Depending on the case, the organization responsible for the design of the aircraft or component can be:

- the 'design approval holder': it may be the holder of a type certificate, a restricted type certificate, a supplemental type certificate, a European Technical Standard Order (ETSO) authorization, a major repair design approval, a major change design approval or any other relevant approval or authorization for products, parts and appliances deemed to have been issued under Part 21;

AMC1 145.65 Maintenance procedures

GENERAL

1. Maintenance procedures should be kept up to date such that they reflect the current best practices within the organization, while being compliant with the Regulation. All organization's employees should report differences via their organization's internal safety reporting scheme.

2. All procedures, and changes to those procedures, should be verified and validated before use where practicable and applicable.

3. All procedures should be designed and presented in accordance with good human factors principles.

GM1 145.65 Maintenance procedures

HUMAN FACTORS PRINCIPLES

The following key points should be considered when designing and presenting technical procedures in accordance with good human factors principles:

(a) The design of procedures and changes should involve maintenance personnel who have a good working knowledge of the tasks;

(b) Ensuring that the procedures are accurate, appropriate and usable, and reflect best practices;

(c) Taking account of the level of expertise and experience of the user;

(d) Taking account of the environment in which the procedures are to be used;

(e) Ensuring that all the key information is included without the procedure being unnecessarily complex;

(f) Where appropriate, explaining the reasons for the procedure;

(g) The order of the tasks and the steps should reflect best practices, with the procedure clearly stating where the order of steps is critical, and where changes to the order are acceptable;

(h) Ensuring consistency in the design of procedures and the use of terminology, abbreviations, references, etc.

(i) For documents produced in the English language, using 'simplified English'.

GM2 145.65(b)(1) Maintenance procedures

Appendix XI to AMC M.708(c) provide guidance on the elements that need to be considered for the maintenance contract between the CAMO and the maintenance organization. The Part-145 organization should take into account these elements to ensure that a clear contract or work order has been concluded before providing maintenance services.

AMC1 145.65(b) (2) Maintenance procedures

Specialized services include any specialized activity, such as, but not limited to, non-destructive testing requiring particular skills and/or qualification. Point 145.30(f) covers the qualification of personnel but, in addition, there is a need to establish maintenance procedures that cover the control of any specialized process.

AMC1 145.70 Maintenance organization exposition (MOE)

(a) Personnel should be familiar with those parts of the MOE that are relevant to their tasks.

(b) The organization should designate the person responsible for monitoring and amending the MOE, including associated procedures or manuals, in accordance with point 145.70(c).

(c) The organization may use electronic data processing (EDP) for the publication of the MOE. Attention should be paid to the compatibility of the EDP systems with the necessary dissemination, both internally and externally, of the MOE.

(d) When information is provided by reference (e.g. separate document, manual or electronic data file), the organization should establish clear cross-reference to such documents or files in the MOE and have procedures for the management of these documents or files.

GM1 145.70 Maintenance organization exposition (MOE)

1. The purpose of the MOE is to:
   - specify the scope of work and show how the organization intends to comply with this Part; and
   - provide all the necessary information and procedures for the personnel of the organization to perform their duties.
2. Complying with its contents will ensure that the organization remains in compliance with Part- 145 and, as applicable, Part-M and Part 19.

AMC1 145.70(a) Maintenance organization exposition (MOE)

This AMC provides an outline of the layout of an acceptable MOE. Where an organization uses a different format, for example, to allow the exposition to serve for more than one approval by CARC, then the exposition should contain an index that shows where the subject matter can be found in the exposition.

1. PART 1 GENERAL

1.1 Statement by the accountable manager
1.2 Safety policy and objectives
1.3 Management personnel

1.4 Duties and responsibilities of the management personnel
1.5 Management organization chart
1.6 List of certifying staff, support staff and airworthiness review staff
1.7 Manpower resources
1.8 General description of the facilities at each address intended to be approved
1.9 Organization's intended scope of work
1.10 Procedures for changes (including MOE amendment) requiring prior approval
1.11 Procedures for changes (including MOE amendment) not requiring prior approval
1.12 Procedure for alternative means of compliance (AltMoC)

2. PART 2 MAINTENANCE PROCEDURES

2.1 Supplier evaluation and subcontractor control procedure
2.2 Acceptance/inspection of aircraft components and material, and installation
2.3 Storage, tagging and delivery of components and material to maintenance
2.4 Acceptance of tools and equipment
2.5 Calibration of tools and equipment
2.6 Use of tooling and equipment by staff (including alternate tools)
2.7 Procedure for controlling working environment and facilities
2.8 Maintenance data and relationship to aircraft/aircraft component manufacturers' instructions including updating and availability to staff
2.9 Acceptance, coordination and performance of repair works
2.10 Acceptance, coordination and performance of scheduled maintenance works
2.11 Acceptance, coordination and performance of airworthiness directives works
2.12 Acceptance, coordination and performance of modification works
2.13 Maintenance documentation development, completion and sign-off
2.14 Technical record control
2.15 Rectification of defects arising during maintenance
2.16 Release to service procedure
2.17 Records for the person or organization that ordered maintenance
2.18 Occurrence reporting
2.19 Return of defective aircraft components to store
2.20 Defective components to outside contractors
2.21 Control of computer maintenance record systems
2.22 Control of man-hour planning versus scheduled maintenance work
2.23 Critical maintenance tasks and error-capturing methods
2.24 Reference to specific procedures such as:

- Engine running procedures
- Aircraft pressure run procedures
- Aircraft towing procedures
- Aircraft taxiing procedures

2.25 Procedures to detect and rectify maintenance errors.

2.26 Shift/task handover procedures
2.27 Procedures for notification of maintenance data inaccuracies and ambiguities
2.28 Production planning and organizing of maintenance activities
2.29 Airworthiness review procedures and records
2.30 Fabrication of parts
2.31 Procedure for component maintenance under aircraft or engine rating
2.32 Maintenance away from approved locations
2.33 Procedure for assessment of work scope as line or base maintenance

PART L2 ADDITIONAL LINE MAINTENANCE PROCEDURES

(Part L2 may complement where necessary, procedures established in Part 2)

L2.1 Line maintenance control of aircraft components, tools, equipment, etc.
L2.2 Line maintenance procedures related to servicing/fuelling/de-icing, including inspection for/removal of de-icing/anti-icing fluid residues, etc.
L2.3 Line maintenance control of defects and repetitive defects L2.4 Line procedure for completion of technical logs
L2.5 Line procedure for pooled parts and loaned parts
L2.6 Line procedure for return of defective parts removed from aircraft
L2.7 Line procedure for critical maintenance tasks and error-capturing methods

3. PART 3 MANAGEMENT SYSTEM PROCEDURES

3.1 Hazard identification and safety risk management schemes
3.2 Internal safety reporting and investigations
3.3 Safety action planning
3.4 Safety performance monitoring
3.5 Change management
3.6 Safety training (including human factors) and promotion
3.7 Immediate safety action and coordination with the operator's emergency response plan (ERP)
3.8 Compliance monitoring
  3.8.1 Audit plan and audit procedures
  3.8.2 Product audit and inspections
  3.8.3 Audit findings — corrective action procedure
3.9 Certifying staff and support staff qualifications, authorization and training procedures
3.10 Certifying staff and support staff records
3.11 Airworthiness review staff qualification, authorization and records
3.12 Compliance monitoring and safety management personnel
3.13 Independent inspection staff qualification

3.14 Mechanics qualification and records
3.15 Process for exemption from aircraft/aircraft component maintenance tasks
3.16 Concession control for deviations from the organization's procedures
3.17 Qualification procedure for specialized activities such as NDT, welding, etc.
3.18 Management of external working teams
3.19 Competency assessment of personnel
3.20 Training procedures for on-the-job training as per Section 6 of Appendix III to Part-66 (limited to the case where CARC for the Part-145 approval and for the Part-66 license is the same).
3.21 Procedure for the issue of a recommendation to CARC for the issue of a Part- 66 license limited to the case where the both the Part-145 approval and for the Part-66 license are issued by CARC.
3.22 Management system record-keeping

4. PART 4 RELATIONSHIP WITH CUSTOMER/OPERATORS

4.1 List of the commercial operators to which the organization provides regular aircraft maintenance services
4.2 Customer interface procedures and paperwork
4.3 [Reserved]

5. PART 5 SUPPORTING DOCUMENTS

5.1 Sample documents
5.2 List of subcontractors as per point 145.75(b)
5.3 List of line maintenance locations as per point 145.75(d)
5.4 List of contracted organizations as per point 145.70(a)(16)
5.5 List of used AltMoC as per point 145.70(a)(17)

AMC1 145.70(a)(1) Maintenance organization exposition (MOE)

ACCOUNTABLE MANAGER STATEMENT

Part 1 of the MOE should include a statement signed by the accountable manager (and countersigned by the chief executive officer, if different), confirming that the MOE and any associated manuals will be complied with at all times.

The accountable manager's exposition statement as specified under point 145.70(a)(1) should embrace the intent of the following paragraph, and in fact, this statement may be used without amendment. Any modification to the statement should not alter the intent.

> 'This exposition and any associated referenced manuals define the organization and procedures upon which the Part-145 approval certificate is issued by CARC.

These procedures are endorsed by the undersigned and must be complied with, as applicable, when contracts or work orders are being progressed under the organization approval certificate.

These procedures do not override the necessity of complying with any new or amended regulation published from time to time where these new or amended regulations are in conflict with these procedures.

It is understood that the approval of the organization is based on the continuous compliance of the organization with Part-145, Part-M, and with the organization's procedures described in this exposition. CARC is entitled to limit, suspend, or revoke the approval certificate if the organization fails to fulfil the obligations imposed by Part-145,Part-M and Part 19 ,as applicable, or any conditions according to which the approval was issued.

We declare that measures mandated by CARC according to 145.155 will be implemented immediately, and that CARC will have access to the organization at any time according to 145.140.

Signed .....

Dated .....

Accountable Manager and..... (quote position).....

Chief Executive Officer …

For and on behalf of..... (quote organization's name). '

Whenever the accountable manager changes, it is important that the new accountable manager signs the statement at the earliest opportunity.

AMC1 145.75(b) Privileges of the organization

SUBCONTRACTING

1. Working under the management system of an organization appropriately approved under Part- 145 (subcontracting) refers to the case of one organization, whether or not it is approved under Part-145, that carries out certain maintenance (see paragraph 3.1) under the approval certificate of a Part-145. In order to subcontract, the Part-145 organization should have a procedure for the control of such subcontractors as described below. Any approved maintenance organization that carries out maintenance under its own approval certificate for another approved maintenance organization is not considered to be subcontracted for the purpose of this paragraph, but contracted by that other organization (see GM2 145.205).

2. Maintenance of engines or engine modules other than 'a complete workshop maintenance check or overhaul' is intended to mean any maintenance that can be carried out without disassembly of the core engine or, in the case of modular engines, without disassembly of any core module.

3. FUNDAMENTALS OF SUBCONTRACTING UNDER PART-145

3.1 The most common reasons for allowing an organization approved under Part-145 to sub- contract is to permit acceptance of certain maintenance tasks carried out by subcontractors when approvals by CARC of those subcontractors are not justified (e.g. limited scope of work, limited volume of maintenance activities, limited number of potential customers, limited need in time) or when the subcontractors cannot demonstrate compliance with all elements of the regulation (e.g. no maintenance facilities, specialized staff not covering all maintenance scope).

This subcontracting option permits the acceptance of the following maintenance:

(a) specialized maintenance services, such as, but not limited to, surface treatment (e.g. plating, plasma spraying), fabrication of specified parts for repairs/ modifications, welding, etc.;

(b) aircraft maintenance (e.g. line maintenance, leaks detection in fuel tanks, special repairs/modifications, complete aircraft painting) up to but not including a complete base maintenance check as specified in point 145.75(b);

(c) To permit the acceptance of component maintenance.;

(d) engine maintenance up to but not including a complete workshop maintenance check or overhaul of an engine or engine module as specified in point 145.75(b).

3.2 When maintenance is carried out under the management system of a Part-145 organization, it means that for the duration of such maintenance, the Part-145 approval has been temporarily extended to include the subcontractor. It therefore follows that all parts of the subcontractor (facilities, personnel, equipment and tools, components, maintenance data and procedures) involved with the maintenance organization's products undergoing maintenance should meet Part-145 requirements and the Part-145 organization's MOE for the duration of that maintenance, and it remains the Part-145 organization's responsibility to ensure such requirements are satisfied.

3.3 When subcontracting, the Part-145 organization is not required to have complete facilities for the maintenance that it needs to sub-contract, but it should have its own expertise to determine whether the subcontractor meets the necessary standards. However, a Part-145 organization cannot be approved unless it has in-house the facilities, personnel, equipment and tools, components, maintenance data, procedures and expertise to carry out the majority of the maintenance for which it wishes to receive the terms of approval.

3.4 The organization may find it necessary to include specialized subcontractors to enable it to be approved to issue the certificate of release to service of a particular maintenance. Examples are provided in point 3.1(a). To authorize the use of such subcontractors, CARC will need to be satisfied that the Part-145 organization has the necessary expertise and procedures to control such subcontractors.

3.5 A maintenance organization working outside the scope of its terms of approval is deemed to be not approved for the work considered. Such an organization may in this circumstance operate only as a subcontractor under the management system and control of another organization appropriately

approved under Part-145.

3.6 Authorization to sub-contract is indicated by CARC approving the MOE containing a specific procedure on the control of subcontractors as well as a list of subcontractors.

4. PART-145 PROCEDURES FOR THE CONTROL OF SUBCONTRACTORS

4.1 A pre-audit procedure should be established whereby the Part-145 organization should audit a prospective subcontractor to determine whether those services of the subcontractor that it wishes to use meet the intent of Part-145. This audit should be performed under the responsibility of the compliance monitoring function.

4.2 The Part-145 organization needs to assess to what extent it will use the subcontractor resources (facilities included). The contract between the Part-145 organization and the subcontractor will determine whether the Part-145 organization requires its own paperwork, maintenance data and components to be used or, provided that they meet the requirements of Part-145, if the facilities, equipment and tools from the subcontractor will be used. In the case of subcontractors who provide specialized services, it may for practical reasons be necessary to use their specialized services paperwork, maintenance data and components, subject to acceptance by the Part-145 organization.

4.3 Unless the sub-contracted maintenance work can be fully inspected on receipt by the Part-145 organization, it will be necessary for the Part-145 organization to establish an MOE procedure to control the subcontracted maintenance work (and associated supporting documents). The organization will need to consider whether to use its own personnel or to authorize the subcontractor personnel for that control.

4.4 The certificate of release to service may be issued either by subcontractor staff holding a certification authorization issued by the Part-145 organization in accordance with points 145.30 and 145.35 as appropriate, or by the Part-145 organization certifying staff.

4.5 The subcontractor control procedure will need to address the relevant management system key processes such as safety risk management and compliance monitoring (see point 145.205). The procedure should ensure that records of all subcontractor audits and inspections, and the corresponding actions are kept, and provide information on when subcontractors are used. The procedure should include a clear revocation process for subcontractors that do not meet the Part-145 maintenance organization's requirements.

4.6 The Part-145 compliance monitoring staff will need to audit the subcontractor control function of the Part-145 organization and to audit the subcontractors unless this task is already carried out by the subcontractor control function on behalf of the compliance monitoring function.

4.7 The contract between the Part-145 organization and the subcontractor should

contain a provision to ensure that access to the subcontractor is granted to any person authorized by the authorities specified in point 145.140.

AMC1 145.85 Changes to the organization

APPLICATION TIME FRAMES

(a) The application for a change to an organization certificate should be submitted at least 30 working days before the date of the intended changes.

(b) In the case of a planned change of a nominated person, the organization should inform CARC at least 20 working days before the date of the proposed change.

(c) Unforeseen changes should be notified at the earliest opportunity, in order to enable CARC to determine whether there is continued compliance with the applicable requirements, and to amend, if necessary, the organization certificate and the related terms of approval.

AMC2 145.85 Changes to the organization

MANAGEMENT OF CHANGES

The organization should manage changes to the organization in accordance with point (e) of AMC1 145.200(a)(3). For changes requiring prior approval, it should conduct a risk assessment and provide it to CARC upon request.

GM1 145.85 Changes to the organization

CHANGES REQUIRING OR NOT REQUIRING PRIOR APPROVAL

Point 145.85 is structured as follows:

- Point (a) introduces an obligation of prior **approval by CARC.**
- Point (b) address all instances (including (a)) where this Part explicitly requires an approval by CARC (e.g. procedure for use of alternative tooling or equipment, ref. 145.40(a)(i)). Changes relevant to these instances should be considered as changes requiring a prior approval (see list in GM1 145.85(b)), unless otherwise specified by this Part.

  Point (b) also indicates how all changes requiring prior approval should be handled;
- Point (c) introduces the possibility for the organization to agree with CARC that certain changes to the organization (other than those covered by (a) or (b)) can be implemented without prior approval depending on the compliance and safety performance of the organization, and in particular, on its capability to apply change management principles.

GM1 145.85(a)(1) Changes to the organization

CHANGE OF THE NAME OF THE ORGANISATION

A change of the name requires the organization to submit an application as a matter of urgency for a re-issue of their certificate.

An amendment copy of the organization registration companies with control department or Jordan free and development zone group to be provided to CARC.

If this is the only change to report, the application can be accompanied by a copy of the documentation that was previously submitted to CARC under the previous name, as a means of demonstrating that the organization complies with the applicable requirements.

GM1 145.85(a)(2) Changes to the organization

CHANGE OF A NOMINATED PERSON

In accordance with point 145.85(a)(2), a change of a nominated person (ref. 145.30) requires a prior approval. In case of a unplanned/unanticipated change, a deputy (such as the deputy referred to in 145.30(b)) may ensure business continuity during the approval process of the new nominated person.

GM1 145.85(b) Changes to the organization

CHANGES REQUIRING PRIOR APPROVAL (OTHER THAN THOSE COVERED BY POINT 145.85(a))

The following are examples of changes that require prior approval by CARC (other than those covered by point 145.85(a)), as specified in Part-145:

(a) changes to the AltMoC [145.120(b)];

(b) changes to the MOE procedure for the use of alternative tooling or equipment [145.40(a)(i)];

(c) changes to the MOE procedure allowing a B-rated organization to carry out maintenance on an installed engine during 'base' and 'line' maintenance [Appendix II, point (f)];

(d) changes to the MOE procedure allowing a C-rated organization to carry out maintenance on an installed component (other than a complete engine/APU) during 'base' and 'line' maintenance or at an engine/APU maintenance facility [Appendix II, point (g)];

(e) changes to the procedures to establish and control the competency of personnel [145.30(e)];

(f) changes to the system for reporting to CARC on the safety performance and regulatory compliance of the organization (in the case of an extension of the oversight planning cycle beyond 12 months).

AMC1 145.95 Findings and observations

FINDING-RELATED CORRECTIVE ACTION PLAN AND IMPLEMENTATION

After receiving the notification of findings, the organization should identify and define the actions for all findings to address the effects of the non-compliance and its root cause(s) and contributing factor(s).

Depending on the issues, the organization may need to take immediate corrections. The corrective action plan should:

- include the correction of the issue, corrective actions and preventive actions, as well as the planning to implement these actions;
- be timely submitted to CARC for acceptance before it is effectively implemented.

After receiving the acceptance of the corrective action plan from CARC, the organization should implement the associated actions.

Within the agreed period, the organization should inform CARC that the corrective action plan has been completed and should send the associated evidence, as requested by CARC.

AMC2 145.95 Findings and observations

DUE CONSIDERATION TO OBSERVATIONS

For each observation notified by CARC, the organization should analyse the related issues and determine when actions are needed.

The handling of the observations may follow a process similar to the handling of the findings by the organization.

The organization should record the analysis and the outputs, such as the actions taken or the reasons for not taking actions.

GM1 145.95 Findings and observations

ROOT CAUSE ANALYSIS

(a) (It is important that the analysis does not primarily focus on establishing who or what caused the non-compliance, but on why it was caused. Establishing the root cause(s) often requires an overarching view of the events and circumstances that led to it, to identify all the possible systemic and contributing factors (regulatory, technical, human factors, organizational factors, etc.) in addition to the direct factors.

(b) A narrow focus on single events or failures, or the use of a simple, linear model, such as a fault tree, to identify the chain of events that led to the non-compliance, may not properly reflect the complexity of the

issue, and therefore there is a risk that important factors that must be addressed in order to prevent a reoccurrence will be ignored.

Such an inappropriate or partial root cause analysis often leads to defining 'quick fixes' that only address the symptoms of the non-conformity. A peer review of the results of the root cause analysis may increase its reliability and objectivity.

GM1 145.120 Means of compliance

GENERAL

(a) Acceptable means of compliance (AMC) are a tool to standardize the demonstration of compliance and facilitate the verification activities of CARC with this Regulation. They are published by CARC to achieve these objectives.

(b) If an organization wishes to use means to comply with the Regulation different from this AMC, that organization may need to demonstrate compliance with the Regulation by using alternative means of compliance (AltMoC):

(1) established by CARC ,

(2) established by that organization and approved by CARC — see point (C) below.

An AltMoC does not allow deviation from the Regulation.

(c) AltMoC established by an organization and approved by CARC:
An organization wishing to use a different means of compliance than the one published by CARC, can propose and implement an AltMoC only once CARC approves it. In this case, the organization is responsible for demonstrating how that AltMoC establishes compliance with the Regulation.

This approval will be granted by CARC on an individual basis and restricted to that specific applicant. Other organizations wishing to use the same means of compliance should follow the AltMoC process (demonstrating compliance with the Regulation) and obtain individual approval from CARC.

GM2 145.120 Means of Compliance

WHEN AN ALTERNATIVE MEANS OF COMPLIANCE IS NEEDED

When there is no CARC AMC for a certain requirement in the Regulation, the means of compliance proposed by the organization to that point of the Regulation do not need to go through the AltMoC process. It is the responsibility of CARC to verify that compliance with the Regulation is met. However, in certain cases the organization may propose, and CARC may agree, to have such means of compliance follow the AltMoC process.

When there is CARC AMC, the AltMoC process is needed in the following (not exhaustive) cases:

– a means to comply with the Regulation is technically different in character to the AMC published by

CARC;

- A Form is significantly different from the one proposed in CARC AMC.

Examples of issues not considered to require an AltMoC process include, but are not limited to:

- editorial changes to a CARC AMC, as long as it does not change the intent of the AMC;
- transposing a CARC AMC into the organizational structure, organizational processes, or standard operating procedures with different wording and terminology customized to the organization's environment, if this does not change the intent of the AMC and its associated level of safety.

AMC1 145.120(b) Means of compliance

DESCRIPTION SUPPORTING THE ALTERNATIVE MEANS OF COMPLIANCE

(a) The description of the AltMoC should include:

- a summary of the AltMoC;
- the content of the AltMoC;
- a statement that compliance with the Regulation is achieved; and
- in support of that statement, an assessment demonstrating that the AltMoC reaches an acceptable level of safety, taking into account the level of safety provided by the corresponding CARC AMC.

(b) All these elements describing the AltMoC form an integral part of the management system records to be kept in accordance with 145.55.

GM1 145.200 Management system

GENERAL

Safety management seeks to proactively identify hazards and to mitigate the related safety risks before they result in aviation accidents and incidents. Safety management enables an organization to manage its activities in a more systematic and focused manner. When an organization has a clear understanding of its role and contribution to aviation safety, it can prioritize safety risks and more effectively manage their resources and obtain optimal results.

The principles of the requirements in points 145.200, 145.202, 145.205 and the related AMC constitute the management system framework for aviation safety management. This framework addresses the core elements of the ICAO safety management system (SMS) framework defined in Part 19, includes the elements of the compliance monitoring system, and promotes an integrated approach to the management of an organization. It facilitates the introduction of the additional safety management components, building upon the existing management system, rather than adding them as a separate framework.

This approach is intended to encourage organizations to embed safety management and risk-based decision-making into all their activities, instead of superimposing another system onto their existing management system and governance structure. In addition, if the organization holds multiple organization certificates within the scope of CARC Regulations, it may choose to implement a single management system to cover all of its activities. An integrated management system may not only be used to capture management system requirements resulting from CARC Regulations but also could cover other regulatory frameworks requiring compliance with Part 19 or other business management systems such as security, occupational health and environmental management systems. Integration will remove any duplication and exploit synergies by managing safety risks across multiple activities. Organizations may determine the best means to structure their management systems to suit their business and organizational needs.

The core part of the management system framework (145.200) focuses on what is essential to manage safety, by mandating the organization to:

(a) clearly define accountabilities and responsibilities;

(b) establish a safety policy and the related safety objectives;

(c) implement safety reporting procedures in line with just culture principles;

(d) ensure the identification of aviation safety hazards entailed by its activities, ensure their evaluation, and the management of the associated risks, including:

  (1) taking actions to mitigate the risks;

  (2) verifying the effectiveness of the actions taken to mitigate the risks;

(e) monitor compliance, while considering any additional requirements that are applicable to the organization;

(f) keep their personnel trained, competent, and informed about significant safety issues; and

(g) document all the key management system processes.

Compared with the previous Part-145 quality system 'framework' (now covered by point (b) and (e)), the new elements that are introduced by the management system are, in particular, those addressed under points (c) and (d).

Points (a), (b) and (g) address component 1 'Safety policy and objectives' of the ICAO SMS framework. Points (c) and (d)(1) address component 2 'Safety Risk Management' of the ICAO SMS framework. Point (d)(2) addresses component 3 'Safety Assurance' of the ICAO SMS framework. Finally, point (f) addresses component 4 'Safety Promotion' of the ICAO SMS framework.

Point 145.200 introduces the following as key safety management processes; these are further specified in the related AMC and GM:

- Hazard identification;
- Safety risk management;
- Internal investigation;
- Safety performance monitoring and measurement;
- Management of change;
- Continuous improvement;
- Immediate safety action and coordination with the aircraft operator's Emergency Response Plan (ERP).

It is important to recognize that safety management will be a continuous activity, as hazards, risks and the effectiveness of safety risk mitigations will change over time.

These key safety management processes are supported by a compliance monitoring function as an integral part of the management system. Most aviation safety regulations constitute generic safety risk controls established by the 'regulator'. Therefore, ensuring effective compliance with the regulations during daily operations and independent monitoring of compliance are fundamental to any management system for safety. The compliance monitoring function may, in addition, support the follow-up of safety risk mitigation actions. Moreover, where non-compliances are identified through internal audits, the causes will be thoroughly assessed and analyzed. Such an analysis in return supports the risk management process by providing insights into causal and contributing factors, including human factors, organizational factors and the environment in which the organization operates. In this way, the outputs of compliance monitoring become some of the various inputs to the safety risk management functions. Conversely, the output of the safety risk management processes may be used to determine focus areas for compliance monitoring. In this way, internal audits will inform the organization's management of the level of compliance within the organization, whether safety risk mitigation actions have been implemented, and where corrective or preventive action is required. The combination of safety risk management and compliance monitoring should lead to an enhanced understanding of the end-to-end process and the process interfaces, exposing opportunities for increased efficiencies, which are not limited to safety aspects.

As aviation is a complex system with many organizations and individuals interacting together, the primary focus of the key safety management processes is on the organizational processes and procedures, but it also relies on the humans in the system. The organization and the way in which it operates can have a significant impact on human performance. Therefore, safety management necessarily addresses how humans can contribute both

positively and negatively to an organization's safety outcomes, recognizing that human behavior is influenced by the organizational environment.

The effectiveness of safety management largely depends on the degree of commitment of the senior management to create a working environment that optimizes human performance and encourages personnel to actively engage in and contribute to the organization's management processes. Similarly, a positive safety culture relies on a high degree of trust and respect between the personnel and the management, and it must therefore be created and supported at the senior management level. If the management does not treat individuals who identify hazards and report adverse events in a consistently fair and just way, those individuals are unlikely to be willing to communicate safety issues or to work with the management to effectively address the safety risks. As with trust, a positive safety culture takes time and effort to establish, and it can be easily lost.

It is further recognized that the introduction of processes for hazard identification and risk assessment, mitigation and verification of the effectiveness of such mitigation actions will create immediate and direct costs, while related benefits are sometimes intangible, and may take time to materialize. Over time, an effective management system will not only address the risks of major occurrences, but also identify and address production inefficiencies, improve communication, foster a better organizational culture, and lead to a more effective control of contractors and suppliers. In addition, through an improved relationship with the authority, an effective management system may result in a reduced oversight burden.

Thus, by viewing safety management and the related organizational policies and key processes as items that are implemented not only to prevent incidents and accidents, but also to meet the organization's strategic objectives, any investment in safety should be seen as an investment in productivity and organizational success.

AMC1 145.200(a)(1) Management system

ORGANISATION AND ACCOUNTABILITIES

(a) The management system should encompass safety by including a safety manager and a safety review board in the organizational structure. The functions of the safety manager are those defined in AMC1 145.30(c);(ca).

(b) Safety review board

(1) The safety review board should be a high-level committee that considers matters of strategic safety in support of the accountable manager's safety accountability.

(2) The board should be chaired by the accountable manager and composed of the person or group of persons nominated under points 145.30.

(3) The safety review board should monitor:

(i) the safety performance against the safety policy and objectives;

(ii) that any safety action is taken in a timely manner; and
(iii) the effectiveness of the organization's management system processes.

(4) The safety review board may also be tasked with:
(i) reviewing the results of compliance monitoring;
(ii) monitoring the implementation of related corrective and preventive actions.

(c) The safety review board should ensure that appropriate resources are allocated to achieve the established safety objectives.

(d) Notwithstanding point (a), where justified by the size of the organization and the nature and complexity of its activities and subject to a risk assessment and agreement by CARC, the organization may not need to establish a formal safety review board. In this case, the tasks normally allocated to the safety review board should be allocated to the safety manager.

GM1 145.200(a) (1) Management system

SAFETY ACTION GROUP

(a) Depending on the size of the organization and the nature and complexity of its activities, a safety action group may be established as a standing group or as an ad hoc group to assist, or act on behalf of the safety manager or the safety review board.

(b) More than one safety action group may be established, depending on the scope of the task and the specific expertise required.

(c) The safety action group usually reports to, and takes strategic direction from, the safety review board, and may be composed of managers, supervisors and personnel from operational areas.

(d) The safety action group may be tasked or assist with:

(1) monitoring safety performance;

(2) defining actions to control risks to an acceptable level;

(3) assessing the impact of organizational changes on safety;

(4) ensuring that safety actions are implemented within the agreed timescales;

(5) reviewing the effectiveness of previous safety actions and safety promotion.

GM2 145.200(a) (1) Management system

MEANING OF THE TERMS 'ACCOUNTABILITY' AND 'RESPONSIBILITY'

In the English language, the notion of accountability is different from the notion of responsibility. Whereas 'accountability' refers to an obligation which cannot be delegated, 'responsibility' refers to an obligation that can be delegated.

AMC1 145.200(a) (2) Management system

SAFETY POLICY AND OBJECTIVES

(a) The safety policy should:

(1) reflect organizational commitments regarding safety, and its proactive and systematic management, including the promotion of a positive safety culture;
(2) include internal reporting principles, and encourage personnel to report maintenance-related errors, incidents and hazards;
(3) recognize the need for all personnel to cooperate with the compliance monitoring and internal investigations referred to under point (c) of AMC1 145.200(a)(3);
(4) be endorsed by the accountable manager;
(5) be communicated, with visible endorsement, throughout the organization; and
(6) be periodically reviewed to ensure it remains relevant and appropriate for the organization.

(b) The safety policy should include a commitment to:

(1) comply with all the applicable legislation, to meet all the applicable requirements, and adopt practices to improve safety standards;
(2) provide the necessary resources for the implementation of the safety policy;
(3) apply human factors principles, including giving due consideration to the aspect of fatigue;
(4) enforce safety as a primary responsibility of all managers; and
(5) apply 'just culture' principles to internal safety reporting and the investigation of occurrences and, in particular, not to make available or use the information on occurrences:

(i) to attribute blame or liability to front-line personnel or other persons for actions, omissions or decisions taken by them that are commensurate with their experience and training; or
(ii) for any purpose other than maintaining or improving aviation safety.

(c) Senior management should continually promote the safety policy to all personnel, demonstrate its commitment to it, and provide necessary human and financial resources for its implementation.

(d) Taking due account of its safety policy, the organization should define safety objectives. The safety objectives should:

(1) form the basis for safety performance monitoring and measurement;
(2) reflect the organization's commitment to maintain or continuously improve the overall effectiveness of the management system;
(3) be communicated throughout the organization; and
(4) be periodically reviewed to ensure they remain relevant and appropriate for the organization.

GM1 145.200(a) (2) Management system

"SAFETY POLICY" and "Just Culture "

(a) The safety policy is the means whereby the organization states its intention to maintain and, where practicable, improve safety levels in all its activities and to minimize its contribution to the risk of an aircraft accident or serious incident as far as is reasonably practicable. It reflects the management's commitment to safety, and should reflect the organization's philosophy of safety management, as well as being the foundation on which the organization's management system is built. It serves as a reminder of 'how we do business here'. The creation of a positive safety culture begins with the issuance of a clear, unequivocal policy.

(b) The commitment to apply 'just culture' principles forms the basis for the organization's internal rules describing how 'just culture' principles are guaranteed and implemented.

(c) 'just culture' principles defines as , means a culture in which front-line operators or other persons are not punished for actions, omissions or decisions taken by them that are commensurate with their experience and training, but in which gross negligence, willful violations and destructive acts are not tolerated.

AMC1 145.200(a) (3) Management system

SAFETY MANAGEMENT KEY PROCESSES

(a) Hazard identification processes

(1) A reporting scheme should be the formal means of collecting, recording, analyzing, acting on, and generating feedback about hazards, events and the associated risks that may affect safety.

(2) The hazards identification should include in particular:

(i) hazards that may be linked to human factors issues that affect human performance; and
(ii) hazards that may stem from the organizational set-up or the existence of complex operational and maintenance arrangements (such as when multiple organizations are contracted, or when

multiple levels of contracting/subcontracting are included).

(b) Risk management processes

(1) A formal safety risk management process should be developed and maintained that ensures reactive, proactive and predictive approach composed by:

(i) analysis (e.g. in terms of the probability and severity of the consequences of hazards and occurrences);
(ii) assessment (in terms of tolerability);
(iii) control (in terms of mitigation) of risks to an acceptable level.

Note: The severity of the consequence should be evaluated to the best knowledge and engineering judgement of the organization, and this evaluation may require collecting information from CARC, incident/accident investigation reports, the design approval holder, the declarant of a declaration of design compliance, etc.

(2) The levels of management who have the authority to make decisions regarding the tolerability of safety risks, in accordance with (b)(1)(ii), should be specified.

(c) Internal investigation

(1) In line with its just culture policy, the organization should define how to investigate incidents such as errors or near misses, in order to understand not only what happened, but also how it happened, to prevent or reduce the probability and/or consequence of future recurrences (refer to AMC1 145.202). This approach should avoid concentrating the analysis on who was (were) directly or indirectly concerned by the events.

(2) The scope of internal investigations should extend beyond the scope of the occurrences required to be reported to CARC in accordance with point 145.60, to include the reports referred to in 145.202(b).

(d) Safety performance monitoring and measurement

(1) Safety performance monitoring and measurement should be the processes by which the safety performance of the organization is verified in comparison with the safety policy and the safety objectives.

(2) These processes may include, as appropriate to the size, nature and complexity of the organization:

(i) safety reporting, which may also address the status of compliance with the applicable requirements;

(ii) safety reviews, including trend reviews, which would be conducted during the introduction of new products and their components, new equipment/technologies, the implementation of new or changed procedures, or in situations of organizational changes that may have an impact on safety;

(iii) safety audits that focus on the integrity of the organization's management system, and on periodically assessing the status of safety risk controls;

(iv) (safety surveys, examining particular elements or procedures in a specific area, such as identified problem areas, or bottlenecks in daily maintenance activities, perceptions and opinions of maintenance management personnel, and areas of dissent or confusion; and

(v) other indicators relevant to safety performance, which may be generated by automated means.

(e) Management of change

Changes may introduce new hazards or threaten existing safety risk controls. The management of change should be a documented process established by the organization to identify external and internal changes that may have an adverse effect on the safety of its maintenance activities. It should make use of the organization's existing hazard identification, risk assessment and mitigation processes.

(f) Continuous improvement

The organization should continuously seek to improve its safety performance and the effectiveness of its management system. Continuous improvement may be achieved through:

(1) audits carried out by external organizations;

(2) assessments, including assessments of the effectiveness of the safety culture and management system, in particular to assess the effectiveness of the safety risk management processes;

(3) staff surveys, including cultural surveys, that can provide useful feedback on how engaged personnel are with the management system;

(4) monitoring the recurrence of incidents and occurrences;

(5) evaluation of safety performance indicators and reviews of all the available safety performance information; and

(6) the identification of lessons learned.

(g) Immediate safety action and coordination with the operator's Emergency Response Plan (ERP)

(1) Procedures should be implemented that enable the organization to act promptly when it identifies

safety concerns with the potential to have an immediate effect on flight safety, including clear instructions on who to contact at the owner/operator/CAMO, and how to contact them, including outside of normal business hours. These provisions are without prejudice to the occurrence reporting required by point 145.60.

(2) If applicable, procedures should be implemented to enable the organization to react promptly if the ERP is triggered by the operator and it requires the support of the Part-145 organization.

GM1 145.200(a)(3) Management system

SAFETY RISK MANAGEMENT — INTERFACES BETWEEN ORGANISATIONS

(a) Safety risk management processes should specifically address the planned implementation of, or participation of the organization in, complex operational and maintenance arrangements (such as when multiple organizations are contracted, or when multiple levels of contracting/subcontracting are included).

(b) Hazard identification and risk assessment start with the identification of all the parties involved in the arrangement, including independent experts and non-approved organizations. This identification process extends to cover the overall control structure, and assesses in particular the following elements across all subcontract levels and all parties within such arrangements:

(1) coordination and interfaces between the different parties;

(2) applicable procedures;

(3) communication between all the parties involved, including reporting and feedback channels;

(4) task allocation, responsibilities and authorities; and

(5) the qualifications and competency of key personnel with reference to point 145.30.

(c) Safety risk management should focus on ensuring the following aspects:

(1) clear assignment of accountability and allocation of responsibilities;

(2) that only one party is responsible for a specific aspect of the arrangement, with no overlapping or conflicting responsibilities, in order to eliminate coordination errors;

(3) the existence of clear reporting lines, both for occurrence reporting and progress reporting;

(4) the possibility for staff to directly notify the organization of any hazard that suggests an obviously unacceptable safety risk as a result of the potential consequences of this hazard.

(d) The safety risk management processes should ensure that there is regular communication between all the parties involved to discuss work progress, risk mitigation actions, and changes to the arrangements, as well as any other significant issues.

GM2 145.200(a)(3) Management system

MANAGEMENT OF CHANGE

(a) Unless they are properly managed, changes in organizational structure, facilities, the scope of work, personnel, documentation, policies and procedures, etc. can result in the inadvertent introduction of new hazards, and expose the organization to new or increased risks. Effective organizations seek to improve their processes, with conscious recognition that changes can expose the organization to potentially latent hazards and risks if they are not properly and effectively managed.

(b) Regardless of the magnitude of a change, large or small, its safety implications should always be proactively considered. This is primarily the responsibility of the team that proposes and/or implements the change. However, a change can only be successfully implemented if all the personnel affected by the change are engaged, are involved and participate in the process. The magnitude of a change, its safety criticality, and its potential impact on human performance should be assessed in any change management process.

(c) The process for the management of change typically provides principles and a structured framework for managing all aspects of the change. Disciplined application of the management of change can maximize the effectiveness of the change, engage the staff, and minimize the risks that are inherent in a change.

(d) The introduction of a change is the trigger for the organization to perform their hazard identification and risk management processes.

Some examples of change include, but are not limited to:

(1) changes to the organizational structure;

(2) the inclusion of a new aircraft type in the terms of approval;

(3) the addition of aircraft of the same or a similar type;

(4) significant changes in personnel (affecting key personnel and/or large numbers of personnel, high turnover);

(5) new or amended regulations;

(6) changes to the security arrangements;

(7) changes in the economic situation of an organization (e.g. commercial or financial pressure);

(8) new schedule(s), location(s), equipment, and/or operational procedures; and

(9) the addition of new subcontractors.

(e) A change may have the potential to introduce new, or to exacerbate pre-existing, human factors issues. For example, changes in computer systems, equipment, technology, personnel changes, including changes in management personnel, procedures, work organization, or work processes are likely to affect performance.

(f) The purpose of integrating human factors (HF) into the management of change is to minimize potential risks by specifically considering the impact of the change on the people within a system.

(g) Special consideration, including any HF issues, should be given to the 'transition period'. In addition, the activities utilized to manage these issues should be integrated into the change management plan.

(h) Effective management of change should be supported by the following:

(1) implementation of a process for formal hazard identification/risk assessment for major operational changes, major organizational changes, changes in key personnel, and changes that may affect the way maintenance is carried out;

(2) identification of changes that are likely to occur in business which would have a noticeable impact on:

(i) resources — material and human;
(ii) management direction — policies, processes, procedures, training; and
(iii) management control;

(3) safety cases/risk assessments that are focused on aviation safety;

(4) the involvement of key stakeholders in the change management process, as appropriate.

(i) During the management of change process, previous risk assessments and existing hazards are reviewed for possible effect.

AMC1 145.200(a)(4) Management system

COMMUNICATION ON SAFETY

(a) The organization should establish communication regarding safety matters that:

(1) ensures that all personnel are aware of the safety management activities, as appropriate for their safety responsibilities;

(2) conveys safety-critical information, especially related to assessed risks and analyzed hazards;

(3) explains why particular actions are taken; and

(4) explains why safety procedures are introduced or changed.

(b) Regular meetings with personnel, at which information, actions, and procedures are discussed, may be used to communicate safety matters.

GM1 145.200(a)(4) Management system

SAFETY PROMOTION

(a) Safety training, combined with safety communication and information sharing, forms part of safety promotion.

(b) Safety promotion activities should support:

(1) the organization's policies, encouraging a positive safety culture, creating an environment that is favorable to the achievement of the organization's safety objectives;

(2) organizational learning; and

(3) the implementation of an effective safety reporting scheme and the development of a just culture.

(c) Depending on the particular safety issue, safety promotion may also constitute or complement risk mitigation actions.

(d) Qualifications and training aspects are further specified in the AMC and the GM to point 145.30.

GM1 145.200(a)(5) Management system

MANAGEMENT SYSTEM DOCUMENTATION

(a) The organization may document its safety policy, safety objectives and all its key management system processes in a separate manual (e.g. a Safety Management Manual or Management System Manual), or in its MOE (see AMC1 145.70(a), Part 3 'Management system procedures'). Organizations that hold multiple organization certificates issued by CARC may prefer to use a separate manual in order to avoid duplication. That manual or the MOE, depending on the case, should be the key instrument for communicating the approach to the management system for the whole of the organization.

(b) The organization may also choose to document some of the information that is required to be documented in separate documents (e.g. policy documents, procedures). In that case, it should ensure that the manual or the MOE contains adequate references to any document that is kept separately. Any such documents are to be considered to be integral parts of the organization's management system documentation.

AMC1 145.200(a)(6) Management system

COMPLIANCE MONITORING — GENERAL

(a) The primary objectives of compliance monitoring are to provide an independent monitoring function on how the organization ensures compliance with the applicable requirements, policies and procedures, and to request action where non-compliances are identified.

(b) The independence of the compliance monitoring should be established by always ensuring that audits and inspections are carried out by personnel who are not responsible for the functions, procedures or products that are audited or inspected.

AMC2 145.200(a)(6) Management system

COMPLIANCE MONITORING — INDEPENDENT AUDIT

(a) An essential element of the compliance monitoring function is the independent audit.

(b) The independent audit should be an objective process of routine sample checks of all aspects of the organization's ability to carry out all maintenance to the standards required by this Regulation. It should include checking compliance of the organization procedures with the Regulation, adherence of the organization to these procedures, and product or maintenance sampling (i.e. product audit), as this is the end result of the maintenance process.

(c) The independent audit should provide an objective overview of the complete set of maintenance-related activities. It should include a percentage of unannounced audits carried out on a sample basis while maintenance is being carried out. This means that some audits should be carried out during the night for those organizations that work at night.

(d) The organization should establish safety and compliance monitoring audit plan to show when and how often the activities as required by this Regulation will be audited.

(e) Except as specified in points (h) and (j), the audit plan should ensure that all aspects of Part-145 compliance and safety management system are verified every year, including all the subcontracted activities. The auditing may be carried out as a complete single exercise or subdivided over the annual period. The independent audit should not require each procedure to be verified against each product line when it can be

shown that the particular procedure is common to more than one product line and the procedure has been verified every year without resultant findings. Where findings have been identified, compliance with the particular procedure should be verified against other product lines until the findings have been closed, after which the independent audit procedure may revert back to a yearly interval for the particular procedure.

(f) Except as specified otherwise in point (h), the independent audit should sample check one product (such as one aircraft or engine or component) while undergoing maintenance on each product line every year as a demonstration of compliance with the maintenance and safety procedures and requirements associated with that specific product. This should include in particular the verification of:

- the maintenance data and compliance with the organization procedures, and safety management system including consideration of safety and human factors issues;
- the facility and maintenance environment;
- the standard of inspection and precautions;
- the completion of work cards/worksheet;
- the tools and material;
- the authorization of the person carrying out maintenance.

For the purpose of this AMC, a product line includes any product under an Appendix II approval class rating as specified in the terms of approval issued to the particular organization.

It therefore follows, for example, that a Part-145 maintenance organization approved to maintain aircraft, engines, brakes and autopilots would need to carry out at least four complete product audits each year, except as specified otherwise in points (f), (h) or (j).

(g) The product audit includes witnessing any relevant testing and visually inspecting the product and the associated documentation. The product audit should not involve repeated disassembly or testing unless the product audit identifies findings that require such an action.

(h) (Except as specified otherwise in point (j), where the organization contracts the independent audit element of the compliance monitoring function in accordance with point (l), the audit should be carried out twice every year.

(i) Except as specified otherwise in point (j), where the organization has line stations listed as per point 145.75(d), the compliance monitoring documentation should include a description of how these line stations are integrated into the monitoring and include a plan to audit each listed line station at a frequency consistent with the extent of flight activity at the particular line

station and the related safety hazards identified. Except as specified otherwise in point (j), the maximum period between audits of a particular line station should not exceed 2 years.

(j) Except as specified otherwise in point (f), provided that there are no safety-related findings, the audit planning cycle specified in this AMC may be increased by up to 100 %, subject to a risk assessment and/or mitigation actions, and agreement by CARC.

(k) A report should be issued each time an audit is carried out describing what was checked and the resulting non-compliance findings against applicable requirement and procedures.

(l) Organizations with a maximum of 10 maintenance staff actively engaged in carrying out maintenance may subcontract the whole independent audit element of the compliance monitoring function to another organization or contract a qualified and competent person to become responsible for this element, with the agreement of CARC.

This does not prevent a larger organization from occasionally using external support for conducting particular audits.

AMC3 145.200(a)(6) Management system

COMPLIANCE MONITORING — CONTRACTING OF THE INDEPENDENT AUDIT

(a) If external personnel are used to perform independent audits:

(1) any such audits should be performed under the responsibility of the compliance monitoring manager; and

(2) the organization remains responsible for ensuring that the external personnel have the relevant knowledge, background, and experience that are appropriate to the activities being audited, including knowledge and experience in compliance monitoring.

(b) The organization retains the ultimate responsibility for the effectiveness of the compliance monitoring function, in particular for the effective implementation and follow-up of all corrective actions.

AMC4 145.200(a)(6) Management system

COMPLIANCE MONITORING — FEEDBACK SYSTEM

(a) Another essential element of the compliance monitoring function is the feedback system.

(b) The feedback system should not be contracted to external persons or organizations.

(c) When a non-compliance is found, the compliance monitoring function should ensure that the root cause(s) and contributing factor(s) are identified (see GM1 145.95), and that corrective actions are defined. The feedback part of the compliance monitoring function should define who is required to address any non-compliance in each particular case, and the procedure to be followed if the corrective action is not completed within the defined time frame. The principal functions of the feedback system are to ensure that all findings resulting from the independent audits of the organization are properly investigated and corrected in a timely manner, and to enable the accountable manager to be kept informed of safety issues and the extent of compliance with Part-145.

(d) The independent audit reports referred to in AMC2 145.200(a)(6) should be sent to the relevant department(s) for corrective action, giving target closure dates. These target dates should be discussed with the relevant department(s) before the compliance monitoring function confirms the dates in the report. The relevant department(s) is (are) required to implement the corrective action and inform the compliance monitoring function of the status of the implementation of the action.

(e) Unless the review of the results from compliance monitoring is given to the safety review board (ref. AMC1 145.200(a)(1) point (b)(4)), the accountable manager should hold regular meetings with staff to check the progress of corrective actions. These meetings may be delegated to the compliance monitoring manager on a day-to-day basis, provided that the accountable manager:

(1) meets the senior staff involved at least twice per year to review the overall performance of the compliance monitoring function; and

(2) receives at least a half-yearly summary report on non-compliance findings.

(f) All records pertaining to the independent audit and the feedback system should be retained for the period specified in point 145.55(c) or for such periods as to support changes to the audit planning cycle in accordance with AMC2 145.200(a)(6), whichever is the longer.

GM1 145.200(a)(6) Management system

COMPLIANCE MONITORING FUNCTION

The compliance monitoring function is one of the elements that is required to be in compliance with the applicable requirements. This means that the compliance monitoring function itself should be subject to independent monitoring of compliance in accordance with 145.200(a)(6).

GM2 145.200(a)(6) Management system

COMPLIANCE MONITORING — AUDIT PLAN

(a) The purpose of this GM is to provide guidance on one acceptable working audit plan to meet part of the needs of point 145.200(a)(6). There is any number of other acceptable working audit plans.

(b) The audits described in the audit plan are intended to monitor compliance with the applicable requirements, and at the same time to review all areas of the organization to which those requirements are applicable.

(c) In order to achieve this objective, as a first element, the organization needs to identify all the regulatory requirements that are applicable to the activity and the scope of work under consideration, to allow the audit plan to focus on the relevant topics. Each topic (e.g. facilities, personnel, etc.) should be cross-referred with the relevant requirement and the related procedure of the organization in the exposition that describes the particular topic. If the organization follows a specific means of compliance to demonstrate compliance with the rule, that information may also be stated.

(d) As a second element, all the functional areas of the organization in which Part-145 functions are intended to be carried out (i.e. the types of maintenance-related activities), including subcontracting, need to be listed in order to identify the applicability of any topic to each functional area.

(e) A matrix can be used, as shown in the example below, to capture the two elements mentioned above. This matrix is intended to be a living document to be customized by each particular organization depending on its scope of work and its structure. This matrix should represent the overall compliance of the audit system, and needs to be amended, as necessary, based upon any change to the applicable regulations, the procedures of the organization or the functional areas of the organization (e.g. a change in the scope of work to include line maintenance, etc.)

Example (to be further completed) of an audit matrix for an organization involved in aircraft base maintenance that does not hold airworthiness review privilege:

Topic	Requirement	Exposition	Functional areas				
			Base maintenance	Compliance monitoring	Subcontracting	Component workshop	...
Facilities	145.25(a)(1)	1.8	X	N/A	X	X	...
	AMC 145.25(a)	2.22	X	N/A	N/A	X	...
	...	...	...	...	...	...	...
Personnel	...	...	...	...	...	...	...
	145.30(c)	1.4	N/A	X	N/A	N/A	...
	145.30(d)	1.7, 2.22	X	X	X	X	...
	...	...	...	...	...	...	...
	145.37	N/A	N/A	N/A	N/A	N/A	...
...	...	...	...	...	...	...	...
Record-keeping	145.55	...	...	...	...	...	...
	...	...	...	...	...	...	...
...	...	...	...	...	...	...	...

(f) The audit plan can be presented as a simplified schedule (see below), showing the operational areas of the organization (i.e. where the maintenance-related activities are effectively carried out) against a timetable to indicate when each particular area was scheduled for audit and when the audit was completed. The audit plan should include a number of product audits (depending on the number of product lines), some of which should be unannounced (see AMC2 145.200(a)(6)).

Example (to be further completed) of an audit plan for an organization, mentioned in point (e), that has two base maintenance hangars, and hydraulic and electrical workshops:

Operational area	Functional area	Planned	Completed	Remarks
Base maintenance hangar 1	Base maintenance	mmm yyyy	dd mmm yyyy	
Base maintenance hangar 2	Base maintenance	mmm yyyy	dd mmm yyyy	
Hydraulic workshop	Component workshop	mmm yyyy	dd mmm yyyy	
Electrical workshop	Component workshop	mmm yyyy	dd mmm yyyy	
Subcontractor 1	Subcontracting	mmm yyyy	dd mmm yyyy	
Product audit 1	Base maintenance	mmm yyyy	dd mmm yyyy	During night
Product audit 2	Component workshop	unannounced	dd mmm yyyy	
...	...	...	...	

(g) The audit of each operational area will review all the topics that are applicable to the relevant functional area. For each topic, the audit should check that the particular Part-145 requirement is documented in the corresponding procedure in the exposition, and that the procedure is effectively implemented in the

operational area that is being audited. In addition, the audit should also identify any practice/process implemented in the operational area which has not been documented in any procedure in the exposition.

GM1 145.200(a)(6) Management system

THE USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES (ICT) FOR PERFORMING REMOTE AUDITS

This GM provides technical guidance on the use of remote information and communication technologies (ICT) to support CARC when overseeing regulated organization and to support regulated organizations when conducting internal audits/monitoring compliance of their organization with the relevant requirements, and when evaluating vendors, suppliers and subcontractors.

In the context of this GM:

- 'remote audit' means an audit that is performed with the use of any real-time video and audio communication tools instead of the physical presence of the auditor on-site; the specificities of each type of approval need to be considered in addition to the general overview (described below) when applying the 'remote audit' concept;
- 'auditing entity' means the organization that performs the remote audit;
- 'auditee' means the entity being audited/inspected (or the entity audited/inspected by the auditing entity via a remote audit);

It is the responsibility of the auditing entity to assess whether the use of remote ICT constitutes a suitable alternative to the physical presence of an auditor on-site in accordance with the applicable requirements.

THE CONDUCT OF A REMOTE AUDIT

The auditing entity that decides to conduct a remote audit should describe the remote audit process in its documented procedures and should consider at least the following elements:

- The methodology for the use of remote ICT is sufficiently flexible and non-prescriptive in nature to optimize the conventional audit process.
- Adequate controls are defined and are in place to avoid abuses that could compromise the integrity of the audit process.
- Measures to ensure that the security and confidentiality are maintained throughout the audit activities (data protection and intellectual property of the organization also need to be safeguarded).

Examples of the use of remote ICT during audits may include but are not limited to:

- meetings by means of teleconference facilities, including audio, video and data sharing;
- assessment of documents and records by means of remote access, in real time;
- recording, in real time during the process, of evidence to document the results of the audit, including non-conformities, by means of exchange of emails or documents, instant pictures, video or/and audio recordings;
- visual (livestream video) and audio access to facilities, stores, equipment, tools, processes, operations, etc.

An agreement between the auditing entity and the auditee should be established when planning a remote audit, which should include the following:

- determining the platform for hosting the audit;
- granting security and/or profile access to the auditor(s);
- testing platform compatibility between the auditing entity and the auditee prior to the audit;
- considering the use of webcams, cameras, drones, etc. when the physical evaluation of an event (product, part, process, etc.) is desired or is necessary;
- establishing an audit plan which will identify how remote ICT will be used and the extent of their use for the audit purposes to optimize their effectiveness and efficiency while maintaining the integrity of the audit process;
- if necessary, time zone acknowledgement and management to coordinate reasonable and mutually agreeable convening times;
- a documented statement of the auditee that they shall ensure full cooperation and provision of the actual and valid data as requested, including ensuring any supplier or subcontractor cooperation, if needed; and
- data protection aspects.

The following equipment and set-up elements should be considered:

- the suitability of video resolution, fidelity, and field of view for the verification being conducted;
- the need for multiple cameras, imaging systems, or microphones, and whether the person that performs the verification can switch between them, or direct them to be switched and has the possibility to stop the process, ask a question, move the equipment, etc.;

- the controllability of viewing direction, zoom, and lighting;
- the appropriateness of audio fidelity for the evaluation being conducted; and
- real-time and uninterrupted communication between the person(s) participating to the remote audit from both locations (on-site and remotely).

When using remote ICT, the auditing entity and the other persons involved (e.g. drone pilots, technical experts) should have the competence and ability to understand and utilize the remote ICT tools employed to achieve the desired results of the audit(s)/assessment(s). The auditing entity should also be aware of the risks and opportunities of the remote ICT used and the impacts they may have on the validity and objectivity of the information gathered.

Audit reports and related records should indicate the extent to which remote ICT have been used in conducting remote audits and the effectiveness of remote ICT in achieving the audit objectives, including any item that has not been able to be completely reviewed.

AMC1 145.202 Internal safety reporting scheme

(a) Each internal safety reporting scheme should ensure confidentiality and enable and encourage free and frank reporting of any potentially safety-related occurrence, including incidents such as errors or near misses, safety issues and identified hazards. This will be facilitated by the establishment of a just culture.

(b) The internal safety reporting scheme should contain the following elements:

(1) clearly identified aims and objectives with demonstrable corporate commitment;

(2) a just culture policy as part of the safety policy, and related just culture implementation procedures;

(3) a process to:

(i) identify those reports which require investigation; and
(ii) when so identified, investigate all the causal and contributing factors, including technical, organizational, managerial, or human factors issues, and any other contributing factors related to the occurrence, incident, error or near miss that was identified;
(iii) if adapted to the size and complexity of the organization, analyses the collective data showing the trends and frequencies of the contributing factors;

(4) appropriate corrective actions based on the findings of investigations;

(5) initial and recurrent training for staff involved in internal investigations;

(6) where relevant, the organization should cooperate with the owner, operator or CAMO on occurrence investigations by exchanging relevant information to improve aviation safety.

(c) The internal safety reporting scheme should:

(1) ensure the confidentiality of the reporter;

(2) be closed loop, to ensure that actions are taken internally to address safety issues and hazards; and

(3) feed into the recurrent training as defined in AMC3 145.30(e) whilst maintaining the appropriate confidentiality.

(d) Feedback should be given to staff both on an individual and a more general basis to ensure their continued support of the safety reporting scheme.

GM1 145.202 Internal safety reporting scheme

GENERAL

(a) The overall purpose of the internal safety reporting scheme is to collect information reported by the organization personnel and use this reported information to improve the level of compliance and safety performance of the organization. The purpose is not to attribute blame.

(b) The objectives of the scheme are to:

(1) enable an assessment to be made of the safety implications of each relevant incident (errors, near miss), safety issue and hazard reported, including previous similar issues, so that any necessary action can be initiated; and

(2) ensure that knowledge of relevant incidents, safety issues and hazards is shared so that other persons and organizations may learn from them.

(c) The scheme is an essential part of the overall monitoring function and should be complementary to the normal day-to-day procedures and 'control' systems; it is not intended to duplicate or supersede any of them. The scheme is a tool to identify those instances in which routine procedures have failed or may fail.

(d) All reports should be retained, as the significance of such reports may only become obvious at a later date.

(e) The collection and analysis of timely, appropriate and accurate data will allow the organization to react to the information that it receives, and to take the necessary action.

GM1 145.205 Contracting and subcontracting

RESPONSIBILITY WHEN CONTRACTING OR SUBCONTRACTING MAINTENANCE

(a) Regardless of the approval status of the subcontracted organizations, a Part-145 organization is responsible for ensuring that all subcontracted activities are subject to hazard identification and risk management, as required by point 145.200(a)(3), and to compliance monitoring, as required by point 145.200(a)(6).

(b) A Part-145 organization is responsible for identifying hazards that may stem from the existence of complex maintenance arrangements (such as when multiple organizations are contracted, or when multiple levels of contracting/subcontracting are included) with due regard to the organizations' interfaces (see GM1 145.200(a)(3)). In addition, the compliance monitoring function should at least check that the approval of the contracted maintenance organization(s) effectively covers the contracted activities, and that it is still valid.

(c) A Part-145 organization is responsible for ensuring that interfaces and communication channels are established with the contracted maintenance organization(s) for occurrence reporting. This does not replace the obligation of the contracted organization(s) to report to CARC in accordance with the Regulation.

For subcontracted activities, interfaces and communication channels are also needed for the purpose of the internal safety reporting scheme (145.202).

GM2 145.205 Contracting and subcontracting

DIFFERENCE BETWEEN 'CONTRACTING MAINTENANCE' AND 'SUBCONTRACTING MAINTENANCE'

(a) 'Subcontracting maintenance' means subcontracting to a third party under the maintenance organization management system.

This is the case when a third party carries out certain maintenance tasks on behalf of the Part-145 organization, and the responsibility remains with the Part-145 organization (this Part- 145 organization must have the tasks within its scope of approval). Whether the third party is approved or not is not relevant for the designation of subcontracting, since the third party will be working under the management system of the Part-145 organization, and the maintenance will be released under the approval of this organization.

(b) 'Contracting maintenance' means contracting to another maintenance organization which will release the maintenance under its own approval.

This is the case when a Part-145 organization, contracted to carry out maintenance by an owner/operator/CAMO, further contracts certain maintenance tasks to another approved Part-145 organization, and transfers the responsibility for the release of such tasks to the second Part-145 organization.

Contracting should only be envisaged when it is allowed by the person or organization that requests the maintenance.

(c) In case (a), the subcontracted organization works under the approval of the contracting organization, whereas in case (b), the contracted organization works under its own approval.

APPENDICES TO ANNEX II (Part-145)

Appendix I – Authorized Release Certificate – CARC Form 18 OF-0227

Appendix II — Class and rating system for the terms of approval of Part-145 maintenance organizations

(a) Except as stated otherwise for the smallest organizations referred to in point (m), the table referred to in point (l) provides the possible classes and ratings to be used to establish the terms of approval of the certificate of the organization approved in accordance with Part-145. An organization must be granted terms of approval that range from a single class and rating with limitations to all classes and ratings with limitations.

(b) In addition to the table in point (l), each maintenance organization is required to indicate its scope of work in its MOE.

(c) Within the approval class(es) and rating(s) established by CARC, the scope of work specified in the MOE defines the exact limits of its approval. It is therefore essential that the approval class(es) and rating(s) and the organization's scope of work match.

(d) A category A class rating means that the maintenance organization may carry out maintenance on aircraft and components (including engines and/or auxiliary power units (APUs)), in accordance with the aircraft maintenance data or, if agreed by CARC, in accordance with the component maintenance data, only while such components are fitted to the aircraft. Nevertheless, such an A-rated maintenance organization may temporarily remove a component for maintenance in order to improve access to that component, except when its removal generates the need for additional maintenance that the organization is not approved to perform. Such removal of component for maintenance by A-rated maintenance organization shall be subject to an appropriate control procedure in the MOE.

The limitation column must specify the scope of such maintenance, thereby indicating the extent of the approval.

(e) Category A class ratings are subdivided into "Base" or "Line" maintenance categories. Such an organization may be approved for either "Base" or "Line" maintenance, or both. It should be noted that a "Line" facility located at a main base facility requires a "Line" maintenance approval.

(f) A category B class rating means that the maintenance organization may carry out maintenance on uninstalled engines and/or APUs and engine and/or APU components, in accordance with the engine and/or APU maintenance data or, if agreed by CARC, in accordance with the component maintenance data, only while such components are fitted to the engine and/or the APU. Nevertheless, such a B-rated approved maintenance organization may temporarily remove a component for maintenance in order to improve access to that component, except when its removal generates the need for additional maintenance that the organization is not approved to perform.

The limitation column must specify the scope of such maintenance, thereby indicating the extent of the approval.

A maintenance organization that is approved with a category B class rating may also carry out maintenance on an installed engine during aircraft base and line maintenance, provided that an appropriate control procedure in the MOE has been approved by CARC. The scope of work in the MOE shall reflect those activities if they are permitted by CARC.

(g) A category C class rating means that the maintenance organization may carry out maintenance on uninstalled components (excluding complete engines and APUs) that are intended to be fitted on the aircraft or the engine/APU.

The limitation column must specify the scope of such maintenance, thereby indicating the extent of the approval.

A maintenance organization that is approved with a category C class rating may also carry out maintenance on an installed component (other than a complete engine/APU) during aircraft base and line maintenance, or at an engine/APU maintenance facility provided that an appropriate control procedure in the MOE has been approved by CARC. The scope of work in the MOE shall reflect those activities if they are permitted by CARC.

(h) A category D class rating is a self-contained class rating that is not necessarily related to a specific aircraft, engine or other component. The D1 – Non-Destructive Testing (NDT) rating is only necessary for a maintenance organization that carries out NDT as a particular task for another organization. A maintenance organization that is approved with a class rating in the A, B or C category may carry out NDT on products that it maintains without the need for a D1 class rating provided that the MOE contains appropriate NDT procedures.

(i) The limitation column is intended to give CARC the flexibility to customize an approval for any particular organization. Ratings may only be mentioned on the approval if they are appropriately limited. The table in point (l) specifies the types of limitations that are possible. It is acceptable to stress in the limitation column the maintenance task rather than the type or manufacturer of the aircraft or engine, if that is more appropriate to the organization (an example could be avionics systems installations and the related maintenance). If that is mentioned in the limitation column, it indicates that the maintenance organization is approved to carry out maintenance up to and including that particular type/task.

(j) When reference is made to the series, type and group in the limitation column of class A and B, it shall be understood as follows:

- "series" means a specific type series such as the Airbus 300, 310 or 319, or the Boeing 737-300 series, the RB211-524 series, the Cessna 150 or Cessna 172, the Beech 55 series, the continental O-200 series, etc.,
- "type" means a specific type or model such as the Airbus 310-240 type, the RB 211-524 B4 type, or the Cessna 172RG type.
  Any number of series or types may be quoted,
- "group" means, for example, Cessna single piston engine aircraft or Lycoming non-supercharged piston engines, etc.

(k) By way of derogation from point 145.85(a)(1), when a component capability list is used that could be subject to frequent amendments, then the organization may propose to include such amendments in the procedure referred to in point 145.85(c) for changes not requiring prior approval.

(l) Table

CLASS	RATING	LIMITATION	BASE	LINE
AIRCRAFT	A1 Aeroplanes above 5 700 kg maximum take-off mass (MTOM)	[Shall state the aeroplane manufacturer or the group or series or type and/or the maintenance tasks] *Example: Airbus A320 Series*	[YES/NO] (*)	[YES/NO] (*)
	A2 Aeroplanes of 5 700 kg MTOM and below	[Shall state the aeroplane manufacturer or the group or series or type and/or the maintenance tasks] *Example: DHC-6 Twin Otter Series* State whether the issuing of airworthiness review certificates is authorised (only possible for aircraft covered by (Part-M)	[YES/NO] (*)	[YES/NO] (*)
	A3 Helicopters	[Shall state the helicopter manufacturer or the group or series or type and/or the maintenance task(s)] *Example: Robinson R44* State whether the issuing of airworthiness review certificates is	[YES/NO] (*)	[YES/NO] (*)

		authorised (only possible for aircraft covered by (Part-M)		
	A4 Aircraft other than A1, A2 and A3 aircraft	[Shall state the aircraft category (sailplane, balloon, airship, etc.), the manufacturer or group or series or type and/or the maintenance task(s)] State whether the issuing of airworthiness review certificates is authorised (only possible for aircraft covered by (Part-M)	[YES/NO] (*)	[YES/NO] (*)
ENGINES	B1 Turbine	[Shall state engine series or type and/or the maintenance task(s)] *Example: PT6A Series*		
	B2 Piston	[Shall state engine manufacturer or group or series or type and/or the maintenance task(s)]		
	B3 APU	[Shall state engine manufacturer or series or type and/or the maintenance task(s)]		
COMPONENTS OTHER THAN COMPLETE ENGINES OR APUs	C1 Air Cond & Press	[Shall state the aircraft type or aircraft manufacturer or component manufacturer or the particular component and/or cross-refer to a capability list in the exposition and/or the maintenance task(s)] *Example: PT6A Fuel Control*		
	C2 Auto Flight			
	C3 Comms and Nav			
	C4 Doors — Hatches			
	C5 Electrical Power & Lights			
	C6 Equipment			
	C7 Engine — APU			
	C8 Flight Controls			
	C9 Fuel			
	C10 Helicopter — Rotors			
	C11 Helicopter — Trans			
	C12 Hydraulic Power			
	C13 Indicating — recording system			
	C14 Landing Gear			
	C15 Oxygen			
	C16 Propellers			
	C17 Pneumatic & Vacuum			
	C18 Protection ice/rain/fire			

	C19 Windows	
	C20 Structural	
	C21 Water ballast	
	C22 Propulsion Augmentation	
SPECIALISED SERVICES	D1 Non - Destructive Testing	[Shall state particular NDT method(s)]
(*) Delete as appropriate		

(m) A maintenance organization which employs only one person to both plan and carry out all its maintenance activities can only hold limited terms of approval. The maximum permissible limits are as follows:

CLASS	RATING	LIMITATION
AIRCRAFT	A2	PISTON ENGINE AEROPLANE OF 5 700 KG MTOM OR LESS
AIRCRAFT	A3	SINGLE PISTON ENGINE HELICOPTER OF 3 175 KG MTOM OR LESS
AIRCRAFT	A4	NO LIMITATIONS
ENGINES	B2	LESS THAN 450 HP
COMPONENTS OTHER THAN COMPLETE ENGINES OR APUs.	C1 TO C22	AS PER CAPABILITY LIST
SPECIALISED SERVICES	D1 NDT	NDT METHOD(S) TO BE SPECIFIED.

Appendix III – Maintenance Organization Certificate – CARC Form 18 OF-0127

The Hashemite Kingdom Of Jordan

Civil Aviation Regulatory Commission

AMO Approval Certificate

Approval No.: CARC.AMO.--

Pursuant to the Civil Aviation Law No. (41) of 2007, and the Jordanian Civil Aviation Regulations (JCAR) Part 145 for the time being in force and subject to the conditions specified below, the Civil Aviation Regulatory Commission (CARC) hereby certifies;

Organization Name

Jordan

As a Part 145 Maintenance Organization approved to maintain the products, parts and appliances listed in the attached approval schedule and issue related certificates of release

Conditions:

1. This approval is limited to that specified in the scope of approval section of the Part 145 approved maintenance organization exposition (MOE),
2. This approval requires compliance with the procedures specified in the Part 145 approved MOE,
3. This approval is valid whilst the approved maintenance organization remains in compliance with Part 145, and
4. Subject to compliance with the foregoing conditions, this approval shall remain valid until the expiry date, unless surrendered, superseded, suspended or revoked.

Date of First Issue: ...../...../.....

Date of Re-issue: ...../...../.....

Date of Expiry: ...../...../..... **Chief Commissioner**

Date of attached Approval Schedule: ...../...../.....

Approval Schedule

Organization Name:

Approval No.: **CARC.AMO.**

Class	Rating	Limitation	Base	Line
AIRCRAFT (**)	(***)	(****)	[YES/NO] (**)	[YES/NO] (**)
	(***)	(****)	[YES/NO] (**)	[YES/NO] (**)
	(***)	(****)	[YES/NO] (**)	[YES/NO] (**)
	(***)	(****)	[YES/NO] (**)	[YES/NO] (**)
Components other than Complete Engines or APUs	(***)	(****)		
Specialized Services	(***)	(****)		

This approval schedule is limited to those products and activities specified in the scope of approval section contained in the Part 145 approved maintenance organization exposition.

Reference: Maintenance Organization Exposition at latest amendment.

Date of issue: --/--/

Chief Commissioner

Appendix IV — Conditions for the use of staff not qualified in accordance with (Part-66) referred to in points 145.30(j)1 and 2

A. Certifying staff in compliance with all the following conditions are deemed to meet the intent of point 145.30(j)(1) and (2):

(a) The person shall hold a license or a certifying staff authorization issued under national regulations in full compliance with ICAO Annex 1.

(b) The scope of work of the person shall not exceed the scope of work defined by the national license or the certifying staff authorization, whatever is the most restrictive.

(c) The person shall demonstrate he/she received the training on human factors and aviation legislation referred to in modules 9 and 10 of Appendix I to (Part-66).

(d) The person shall demonstrate 5 years maintenance experience for line maintenance certifying staff and 8 years for base maintenance certifying staff. However, those persons whose authorized tasks do not exceed those of a Part-66 category A certifying staff, need to demonstrate 3 years maintenance experience only.

(e) Line maintenance certifying staff and base maintenance support staff shall demonstrate he/she received type training and passed examination at the category B1, B2 or B3 level, as applicable, referred to in Appendix III to (Part-66) for each aircraft type in the scope of work referred to in point (b). Those persons whose scope of work does not exceed those of a category A certifying staff may however receive task training in lieu of a complete type training.

(f) Base maintenance certifying staff shall demonstrate he/she received type training and passed examination at the category C level referred to in Appendix III to (Part-66) for each aircraft type in the scope of work referred to in point (b), except that for the first aircraft type, training and examination shall be at the category B1, B2 or B3 level of Appendix III.

Appendix IV to AMC5 145.30(e) — Fuel Tank Safety Training

This appendix includes general instructions for providing training on fuel tank safety issues.

A. Effectivity:

- Large aeroplanes (CS-25) with a maximum type certified passenger capacity of 30 or more or a maximum certified payload capacity of 7500 lbs. (3402 kg) cargo or more or multi-engined helicopter

B. Affected organizations:

- Part-145 approved maintenance organizations involved in the maintenance of aeroplanes specified in paragraph A) and fuel system components installed on such aeroplanes when the maintenance data are affected by CDCCL.

C. Persons from affected organizations who should receive training:

Phase 1 only:

- The group of persons representing the maintenance management structure of the organization, the compliance monitoring manager, the safety manager and the staff who are directly involved in monitoring the compliance of the organization.
- Personnel of CARC who are responsible for the oversight of Part-145 approved maintenance organizations specified in paragraph B).

Phase 1 + Phase 2 + recurrent training:

- Personnel of the Part-145 approved maintenance organization who are required to plan, perform, supervise, inspect and certify the maintenance of the aircraft and fuel system components specified in paragraph A).

D. General requirements of the training courses

Phase 1 – Awareness:

The training should be carried out before the person starts to work without supervision but not later than 6 months after joining the organization. The persons who have already attended the Level 1 Familiarization course.

Type: It should provide awareness of the principal elements of the subject. It may take the form of a training bulletin, or any other self-study or informative session. The signature of the trainer is required to ensure that the person has passed the training.

Level: It should be a course at the level of familiarization with the principal elements of the subject.

Objectives: The trainee should, after the completion of the training:

1. be familiar with the basic elements of the fuel tank safety issues,

2. be able to give a simple description of the historical background and the elements requiring a safety consideration, using common words and showing examples of non-conformities,

3. be able to use typical terms.

Content: The course should include:

- a short background showing examples of FTS accidents or incidents,
- the description of concept of fuel tank safety and CDCCL,
- some examples of manufacturers documents showing CDCCL items,
- typical examples of FTS defects,
- some examples of TC holders repair data,
- some examples of maintenance instructions for inspection.

Phase 2 – Detailed training

Staff should have received Phase 2 training or within 12 months of joining the organization,

Type: It should be a more in-depth internal or external course. It should not take the form of a training bulletin, or any other self-study. At the end of the course, the trainees should be required to take an examination, which should be in the form of multiple-choice questions, and the pass mark of the examination should be 75%.

Level: It should be a detailed course on the theoretical and practical elements of the subject.

The training may be made either:

- in appropriate facilities containing examples of components, systems and parts affected by Fuel Tank Safety (FTS) issues. The use of films, pictures and practical examples on FTS is recommended; or
- by attending a distance course (e-learning or computer based training) including a film when such film meets the intent of the objectives and content here below. An e-learning or computer based

training should meet the following criteria:

- A continuous evaluation process should ensure the effectiveness of the training and its relevance;
- Some questions at intermediate steps of the training should be proposed to ensure that the trainee is authorized to move to the next step;
- The content and results of examinations should be recorded;
- Access to an instructor in person or at distance should be possible in case support is needed.

A duration of 8 hours for phase 2 is an acceptable compliance.

When the course is provided in a classroom, the instructor should be very familiar with the data in Objectives and Guidelines. To be familiar, an instructor should have attended himself a similar course in a classroom and made additionally some lecture of related subjects.

Objectives:

The attendant should, after the completion of the training:

- have knowledge of the history of events related to fuel tank safety issues and the theoretical and practical elements of the subject, have an overview of the FAA regulations known as SFAR (Special FAR) 88 of the FAA and of JAA Temporary Guidance Leaflet TGL 47, be able to give a detailed description of the concept of fuel tank system ALI (including Critical Design Configuration Control Limitations CDCCL, and using theoretical fundamentals and specific examples;
- have the capacity to combine and apply the separate elements of knowledge in a logical and comprehensive manner;
- have knowledge on how the above items affect the aircraft;
- be able to identify the components or parts or the aircraft subject to FTS from the manufacturer's documentation,
- be able to plan the action or apply a Service Bulletin and an Airworthiness Directive.

Content: Following the guidelines described in paragraph E).

Recurrent training:

The organization should ensure that the recurrent training is required in each 2-year period. The syllabus of the training program referred to in Chapter 3.9 of the maintenance organization exposition (MOE) should include the additional syllabus for this recurrent training.

The continuation training may be combined with the phase 2 training in a classroom or at distance.

The continuing training should be updated when new instruction are issued which are related to the material, tools, documentation and manufacturer's or competent authority's directives.

E. Guidelines for preparing the content of Phase 2 courses.

The following guidelines should be taken into consideration when the phase 2 training program are being established:

(a) understanding of the background and the concept of fuel tank safety,

(b) how the mechanics can recognize, interpret and handle the improvements in the instruction for continuing airworthiness that have been made or are being made regarding the fuel tank system maintenance,

(c) awareness of any hazards especially when working on the fuel system, and when the Flammability Reduction System using nitrogen is installed.

Paragraphs a), b) and c) above should be introduced in the training program addressing the following issues:

(i) The theoretical background behind the risk of fuel tank safety: the explosions of mixtures of fuel and air, the behavior of those mixtures in an aviation environment, the effects of temperature and pressure, energy needed for ignition etc, the 'fire triangle', - Explain 2 concepts to prevent explosions:

(1) ignition source prevention and

(2) flammability reduction,

(ii) The major accidents related to fuel tank systems, the accident investigations and their conclusions,

(iii) SFAR 88 of the FAA and JAA Interim Policy INT POL 25/12: ignition prevention program initiatives and goals, to identify unsafe conditions and to correct them, to systematically improve fuel tank maintenance),

(iv) Explain the briefly concepts that are being used: the results of SFAR 88 of the FAA and JAA INT/POL 25/12: modifications, airworthiness limitations items and CDCCL,
(v) Where relevant information can be found and how to use and interpret this information in the applicable maintenance data as defined in 145.45(b),
(vi) Fuel Tank Safety during maintenance: fuel tank entry and exit procedures, clean working environment, what is meant by configuration control, wire separation, bonding of components etc,
(vii) Flammability reduction systems when installed: reason for their presence, their effects, the hazards of an FRS using nitrogen for maintenance, safety precautions in maintenance/working with an FRS,
(viii) Recording maintenance actions, recording measures and results of inspections.

The training should include a representative number of examples of defects and the associated repairs as required by the TC/STC holders' maintenance data.

F. Approval of training

For Part-145 approved organizations, the approval of the initial and continuation training program and the content of the examination can be achieved by the change to the MOE. The necessary changes to the MOE to meet the content of this decision should be made and implemented at the time requested by CARC.