



Advisory Circular

AC145-1

Aircraft Maintenance Organisations - Certification

Initial Issue

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GENERAL

Civil Aviation Authority Advisory Circulars (AC) contain information about standards, practices and procedures that the Director has found to be an Acceptable Means of Compliance (AMC) with the associated rule.

An AMC is not intended to be the only means of compliance with a rule, and consideration will be given to other methods of compliance that may be presented to the Director. When new standards, practices or procedures are found to be acceptable, they will be added to the appropriate Advisory Circular.

This Advisory Circular also includes Explanatory Material (EM) where it has been shown that further explanation is required. Explanatory Material must not be regarded as an acceptable means of compliance.

PURPOSE

This Advisory Circular provides methods, acceptable to the Director, for showing compliance with the requirements of Part 145 for the certification of aircraft maintenance organisations and explanatory material to assist in showing compliance with those requirements.

RELATED CAR

This AC relates specifically to Civil Aviation Rule Part 145.

CHANGE NOTICE

There was no previous issue of this AC, consequently no change is in effect.

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Subpart A – General

EM 145.1 Purpose

Part 145 applies to organisations seeking certification as aircraft maintenance organisations. Organisations located outside Papua New Guinea will only be certificated if the service they provide requires them to be certificated. This could occur if they provide maintenance services to a Papua New Guinea operator or organisation. Appendix B addresses the issues of sub-contracting.

EM 145.3 Definitions

The definitions shown in this rule are specific to Part 145. Definitions associated with more than one Part are contained in Part 1.

EM 145.5 Requirement for certificate

This rule prohibits any maintenance activity encompassed by the ratings detailed in 145.11 from being carried out unless that activity is conducted by an organisation certificated under Part 145.

The effect of this rule is to make the provision of all maintenance subject to Part 145.

EM 145.7 Application for certificate

The application form CAA 145/01 must be completed in full and must identify the full extent of the intended operation. This information will be used in determining the ratings to be issued under 145.11 and the assessment and preparation of any limitations associated with the certificate.

Form CAA 145/01 can be obtained from the CAA Airworthiness Authority.

The applicant should submit the application not less than 90 days before the date of the intended operation. For applicants that apply without giving 90 days notice the CAA may not be able to offer any confirmation that the operation will be certificated in time to meet the applicant's deadline.

Applicant's should plan their certification programme in advance and early consultation with the CAA will ensure all issues are dealt with well before the planned start-up date. Having said this, the time involved for certification is dependent on the quality and completeness of the application and exposition.

EM 145.9 Issue of certificate

There are several requirements to be met for the issue of the certificate. Primarily, the applicant must meet the requirements of Subpart B of Part 145 to be issued a certificate.

To be assessed as meeting the requirements of Subpart B the applicant's documentation will be checked for compliance with the rules and suitability for the type of maintenance tasks the applicant is proposing to carry out.

After the documentation is accepted as satisfactory, an entry inspection of the applicant's facilities and resources will be made and will normally include interviews with key staff members.

Once the CAA is satisfied with the organisation and the applicant's nominated senior persons have been assessed as fit and proper as required by the Act, the certificate is issued. A certificate will normally be issued for a limited period on completion of which, a full compliance audit will be conducted before full certification is given. The length of the initial induction period will depend on the type of maintenance work proposed, the adequacy of resources, and the experience of the applicant and their staff.

EM 145.11 Privileges of certificate holder

The certificate is issued with ratings reflecting the level of maintenance the organisation will be considered competent to perform.

Ratings available for maintenance organisations are—

- A1 for the maintenance of aircraft with a MCTOW of more than 13 610 kg as defined in the organisation's exposition
- A2 for the maintenance of aircraft with a MCTOW of more than 5 700 kg but less than 13 610 kg as defined in the organisation's exposition
- A3 for the maintenance of aircraft not included in A1 or A2 but with a certificated seating configuration of 10 seats or more, as defined in the organisation's exposition
- A4 for the maintenance of aircraft with a MCTOW of 5 700 kg or less and 9 seats or less as defined in the organisation's exposition
- A5 for the maintenance of aircraft with a MCTOW of 5 700 kg or less which are type accepted in the restricted category and are not included in A3 or A4 ratings
- C1 for the maintenance of aircraft engines and propellers as defined in the organisation's exposition
- C2 for the maintenance of components as defined in the organisation's exposition
- C3 for the maintenance of aircraft electrical equipment as defined in the organisation's exposition
- C4 for the maintenance aircraft instrument equipment as defined in the organisation's exposition
- C5 for the maintenance aircraft radio equipment as defined in the organisation's exposition
- E1 for the conduct of aircraft maintenance engineer licence rating training
- P1 for the maintenance of aircraft and components involving processing not otherwise included in any of the above ratings and as defined in the organisation's exposition.

Whilst the ratings are general abilities, the detailed capability of an organisation should be stated in their exposition. This detailed capability will largely be dependent on the facilities the organisation has access to and the experience of the personnel the organisation employs. An applicant should not detail activities the organisation will not be able to provide when issued with a certificate. Future intentions should not be included in the application.

The Director may prescribe limitations and conditions on a maintenance organisation certificate. These limitations placed upon the certificate may include models from a type certificate, limitations based on the applicable requirements of Part 43, Part 66, or general qualifications on the maintenance activities considered appropriate.

EM 145.13 Duration of certificate

The initial issue of a certificate will normally be for a period of six months to enable the organisation to demonstrate compliance with their exposition and Part 145. Prior to the expiry of the initial certificate the CAA will conduct a full compliance inspection of the organisation and, if satisfactory, a longer duration certificate, usually two years, will be issued.

The initial compliance audit should ensure that the organisation is complying with their exposition and that the exposition accurately reflects the organisation's activities. Future audits will examine similar compliance requirements and any other relevant matters.

Certificates which expire, or are revoked, must be returned immediately to the CAA Airworthiness Authority.

Suspended certificates should also be forwarded immediately to the CAA for endorsement.

EM 145.15 Notification of ceasing maintenance

If an organisation decides to cease maintenance activity, this rule requires the certificate holder to notify the CAA. A letter should be sent to the CAA Airworthiness Authority, together with the certificate, within 30 days of ceasing activity.

As well as ensuring the CAA has an accurate picture of the aircraft maintenance organisations in operation in Papua New Guinea, this rule ensures continuing airworthiness responsibilities are addressed when a maintenance organisation ceases to operate.

EM 145.17 Renewal of certificate

The rule specifies a period of 30 days before the certificate expires for application for renewal. The certificate holder should make provision for this in the exposition. The renewal of a maintenance organisation certificate may be delayed if the organisation's application is not forwarded with the required lead-time.

An organisation should allow sufficient time for the renewal process to be planned and carried out. The time involved will vary according to the type of maintenance activity the organisation is certificated for and carrying out, as well as the period the certification has been in force.

Where a certificate has been in force for the full two years, a re-entry application and audit process will be required to be followed. This process will ensure that all facets of the organisation comply with Part 145 and the latest revision of its exposition. The extent of this re-entry process will depend on the organisation's conduct to date, any changed circumstances, and results of safety audit findings over the period of validity.

Subpart B – Certification Requirements

EM 145.51 Personnel requirements

145.51(a)(1)

The intent of the rule regarding the responsibility and authority of the Chief Executive is to ensure that:–

- the maintenance activities carried out by the organisation can be financed
- those activities are carried out in accordance with Part 145
- the organisation complies with the requirements of Part 145.

It is clear that this person needs to have the authority to ensure the activities of the operation can be financed. A suggested method of demonstrating this could be by presenting an annual business forecast, or have as a part of compliance with rule 145.69(a)(3), the authority to finance the operation clearly defined as part of the Chief Executive responsibilities.

The Chief Executive must assure that the exposition complies with the rules. The exposition amendment procedures should cover this.

The Chief Executive must also be assured that maintenance is conducted in compliance with the exposition. Ensuring compliance with the exposition is the responsibility of the senior persons under rule 145.51(a)(2) and the assurance that the Chief Executive requires could be shown through the medium of the internal audit reports or inspections.

This person will need to demonstrate during initial application and at any other time, that they have the knowledge to control the organisation.

If an organisation has several independent business units then it may be appropriate to apply for certification independently. If this is the case a Chief Executive will be required to be identified for the maintenance unit

specifically.

If, on the other hand, an organisation retains one identity the Chief Executive should be clearly shown to have an appropriate level of authority. This may occur where an organisation is certificated for other tasks such as manufacture or design and only one core exposition is used for all administrative functions.

145.51(a)(2)

The rule identifies what are considered the critical members of an organisation who will exercise an appropriate level of control, direction, and responsibility, to ensure the continued effectiveness of the operation. The applicant's nominated senior persons must be employed, contracted or otherwise engaged to work sufficient hours such that the individual can fulfil the management functions associated with the size and scope of the applicant's business.

The responsibilities of senior persons are as follows—

Maintenance control

Responsibility for ensuring that—

- all maintenance including any defect rectification carried out during base maintenance, on the line or at outstations is carried out according to the standards specified in the organisation's exposition
- all work on aircraft components is carried out to the standards specified in the organisation's exposition
- all the standards and procedures specified in the organisations exposition in relation to the organisation's component and materials stores are complied with
- all required data is available and accessible to all staff who require access to it, to carry out their tasks
- all data is at the latest revision status
- all required maintenance records are kept in a manner acceptable to the authority, and that the records are retained for the required time
- any corrective action relating to the provision of maintenance resulting from internal quality assurance activity is speedily and fully carried out

Personnel authorisations

Responsibility for ensuring that—

- personnel meet the initial and on-going training and qualification criteria defined in the exposition
- staff are authorised appropriately for performing certifications on behalf of the organisation
- personnel are assessed as meeting the prerequisite requirements for authorisation, including technical competence
- any corrective action relating to personnel authorisation resulting from internal quality assurance activity is speedily and fully carried out

Internal quality assurance

Responsibility for ensuring that—

- the organisation remains in compliance with Part 145
- the exposition and the associated procedures remain adequate for the scope of the organisations activities
- any exemptions required are processed in accordance with the organisation's procedures and

Part 11

- support systems effectively provide for the activities of any internal quality assurance personnel
- any corrective action relating to the exposition, procedures, qualifications, personnel, or support systems resulting from the internal quality assurance programme is quickly and effectively carried out

For large organisations, separate people are considered necessary for each of the functions listed in this rule. Additional positions nominated might include Chief Engineer, Base Maintenance Manager, Line Maintenance Manager, Workshop Manager, Technical Services Manager, and Supply Manager. Titles may vary between organisations but the requirement is for management representatives for maintenance control, personnel authorisations, and internal quality assurance.

An organisation may choose to appoint managers for all or any combination of these areas of responsibility. It must be clearly stated in the exposition which particular area of responsibility each nominated senior person has been allocated. Whatever areas of responsibility they are allocated, the managers will be ultimately responsible to the Chief Executive. To be accepted, nominated managers should have adequate knowledge and satisfactory experience relevant to their area of responsibility. In addition, technical managers will be expected to have certifying experience on aircraft or equipment similar to that for which the organisation seeks certification.

Persons nominated for these positions are expected to have at least six years experience relevant to their area of responsibility. Lesser experience may be accepted where the area of responsibility is restricted, such as in component shops, or where the nominated persons have undergone a recognised course of training relevant to the position.

However, this approach is clearly not appropriate to medium and small organisations and the Director may exercise some discretion if the size and scope of the applicant's organisation indicates that combining of some responsibilities is acceptable. An applicant requesting this discretion should consult with the CAA during the initial meetings.

Where positions are combined the applicant will be required to provide evidence to demonstrate the person has sufficient time and resources to be reasonably expected to fulfil the responsibilities for the positions, considering the size and scope of the applicant's business. Individuals undertaking one or more functions in the organisation should have a clear understanding of the division of the responsibilities and be able to demonstrate this to the CAA.

Some functions should not be combined as they conflict with responsibilities assigned to the intended positions, for example, the functions of Chief Executive and Quality Assurance.

145.51(a)(3)

An organisation must show that it has sufficient staff to complete all its planned maintenance activities. Where more than one maintenance contract is held, including any for work done outside of Papua New Guinea, the total workload must be considered. It may be necessary to have a man-hours plan to illustrate the sufficiency of staff, and this should relate to any hangar-visit plan which is produced. Man hours dedicated to the Quality Assurance function must also be considered when assessing staffing requirements.

A sufficient number of authorised persons is required at all times to ensure that all maintenance activities are performed in accordance with acceptable methods, techniques and practices.

145.51(b)

The competence of all staff should be determined on the basis of—

- academic qualifications
- licences, certificates or approvals held
- employment records
- written, oral, or practical examination

The organisation should provide for the assessment and maintenance of the levels of competency of all personnel.

145.51(c)

At the time of application the applicant must consider how they will deal with transfer of the senior person functions, to other suitable and qualified persons during periods of absence. Although the rule does not make provision for or have any requirement for the situation where a senior person may be absent for a prolonged period of time, or vacates the position it is advisable to provide for this in advance. Consideration should also be given to a situation where a senior person has been incapacitated. This would in effect cause the position to be vacant for the period of incapacitation and would require a substitute person to meet the requirements of this Part. In the event that the responsibilities and functions are transferred to another person they would also be required to be fit and proper, and have at least the experience and qualifications of the person they replace.

In the event an applicant chooses not to provide for the situation where a senior nominated person vacates a position, it should be remembered that the Director has to be notified of such a situation and the certificate holder will also be called to provide details of the contingency arrangements to be implemented pending a permanent solution being achieved.

It should be noted that where a change of senior person is proposed, rule 145.103(d) requires the prior notification of the change and acceptance by the Director.

In accepting such contingency arrangements, the Director may impose limitations or conditions of a temporary nature for the period of the contingency as provided for in Part 145.103(e). The conditions or limitations imposed by the Director in all cases will be clearly stated to the certificate holder in writing, and could be as simple as providing a time frame for events to take place or a total suspension of maintenance activity.

EM 145.53 Maintenance personnel duty time limitations

This rule requires an applicant to establish procedures to ensure personnel making release to service certifications are fit to make such certifications. The limitations specified in the rule have been established as reasonable criteria to prevent undue fatigue. Any alternative scheme proposed by the applicant should show an equivalent level of fatigue management.

EM 145.55 Facility requirements

Hangars and workshops

For some minor maintenance of aircraft, such as transit checks or defect rectification, hangars are not essential. However, it must be shown that hangar accommodation is available to the organisation for such maintenance when the weather is inclement or when rectification requires significant depaneling or disassembly of the aircraft.

Hangarage of sufficient size must be permanently available for all other maintenance of aircraft. If the hangar is not owned by the applicant then it must be shown that the organisation has control of the use of the hangar. Depending on the size of the organisation, and the throughput of work, the applicant may be required to produce a visit plan to show that it can accommodate the aircraft it intends to maintain. Aircraft component maintenance workshops should be large enough to accommodate the size and numbers of components it plans to maintain regularly.

The working accommodation must protect aircraft and components from the normal weather conditions which can be expected over any twelve month period. Hangar structures and aircraft component workshops must prevent the ingress of airborne contamination such as rain, hail, ice, snow, wind and dust. Hangar and workshop floors should be sealed to minimise dust generation and to facilitate cleaning. Work areas used for different purposes should be sufficiently segregated to prevent cross-contamination.

Office accommodation

Office accommodation must be provided for management, planning, technical records, quality, certifying and

other staff. The accommodation must be adequate to allow staff to carry out their designated tasks in a way which contributes to the safe maintenance of aircraft or aircraft components. Aircraft maintenance staff should be provided with facilities where they can study maintenance instructions and complete maintenance records properly.

It is acceptable to combine any or all of the above office accommodation, but staff must still be able to carry out their assigned tasks without undue distraction from other activities in the same office. Where offices are housed within hangars the accommodation shall allow both technical and administrative work to be carried out effectively.

Working environment

The working environment, for maintenance carried out under this rule, is any condition which may affect the safety or quality of the work. The maintenance organisation must at least comply with the conditions prescribed in the appropriate manufacturer's maintenance manuals, repair manuals or other technical publications which detail the work. Civil Aviation Rules cannot set conditions for workplace safety, these are prescribed elsewhere in Health and Safety and Employment legislation.

Temperature of the working environment should allow hand tools to be used without discomfort, and allow complex maintenance operations to be accomplished safely. Where particular temperatures are required for processes, these should be able to be maintained, and the staff should be protected from temperature extremes.

Lighting should be arranged to give a level of illumination at least the equivalent of normal daylight at any time of the day. Special lighting may be required for complex or detailed task performance. Lighting should allow normal colour vision and discrimination.

Structures and machinery should not contribute to contamination of aircraft and components by the generation or release of fumes, ozone or similar. Airborne contamination should be kept to a minimum by means of dust suppression measures and by extraction. Some components may need protection from natural lighting, or from ultra-violet radiation.

The level of noise should not be permitted to rise to the point where it causes distraction to staff while carrying out their duties. Where it is impracticable to control the noise at source, affected staff must be provided with the necessary personal protection equipment to prevent distraction during their work.

Where maintenance is performed outside of hanger or workshop facilities, the working environment must be maintained as near as possible to conditions prevailing inside. The working conditions should not in any way be detrimental to the quality of the work being carried out. Consideration must be given to temperature, to light, to moisture, and to hail, ice, wind, dust, or any other airborne contamination. Where necessary rain, wind and dust protection and artificial lighting should be provided. Where the environmental conditions deteriorate to an unacceptable level, the particular maintenance task must be suspended until satisfactory conditions are re-established.

Storage facilities

Secure and separate storage facilities must be provided for serviceable and for unserviceable aircraft components, equipment and materials so that the integrity of the release documentation is maintained. There should be separate quarantine, bond, and commercial storage areas. Petrochemicals and other hazardous substances should be stored away from each other and located so that there is no possibility of contaminating any maintenance operation.

Dangerous Goods Regulations administered by the Department of Labour, may be applicable to the storage of some products.

Storage facilities for aircraft components must be clean, well ventilated and stable. Conditions of temperature and humidity should be maintained to minimise the effects of condensation. Manufacturers' standards and recommendations should be followed for specific items.

Storage racks should be provided to give appropriate conditions for all items stored. For large items, racks should be sufficiently strong and designed in such a way as to provide adequate support so that distortion of components does not occur during storage. For small items, bins should be provided so that the items are protected against damage from larger or heavier items, and so that they are easier identified and located.

Aircraft components should, wherever possible, be stored in their original packaging to minimise damage and corrosion during storage. Packaging should be checked periodically to ensure its integrity.

An organisation must establish procedures to adequately control items which are subject to shelf life or special storage conditions.

EM 145.57 Equipment, tools and materials

An applicant for Part 145 certification must show that all tools and equipment, specified in the manufacturers' technical documentation, are readily available to meet the intended scope of the certificate. Where a manufacturer specifies a particular tool, or item of equipment, that tool or item of equipment must be used, and must either be permanently on hand or available as required in accordance with documented arrangements in the exposition.

An organisation must show that it has sufficient access equipment, inspection platforms and, where applicable, aircraft servicing docks to properly inspect the aircraft it intends to maintain.

An organisation must hold the raw materials, aircraft components, and expendables recommended by the aircraft, or component manufacturer of the equipment to be maintained. Alternatively, it may be shown that there is an established provisioning procedure.

An organisation must provide, for the aircraft or components maintained, all the tools, equipment, and test equipment necessary to measure, calibrate, or test an aircraft, aircraft system or aircraft component to an acceptable standard.

Tools and equipment must be controlled so that their location is always known. There must be a procedure to ensure that at shift changes, or when aircraft leave the organisation, there is no possibility that tools or equipment remain on the aircraft.

In order to control tools, equipment and test equipment, organisations must have a procedure to inspect, service and, where appropriate, calibrate such items regularly. A clear system of identification for all tooling, equipment and test equipment must be provided. There must be a means of indicating to users when the next inspection, service or calibration is due. The identification method must also have a means to show whether the item is unserviceable for any reason which may not be obvious to the user.

A register and record of calibrations must be maintained for all precision tooling and equipment. The standards to be used for all calibrations must be clearly defined and must be acceptable to the authority.

Inspection, service or calibration periods must be as recommended by the equipment manufacturer except where an organisation can show, by statistical means, that a different period is appropriate in particular circumstances.

Information on calibration will be published as an AC at a later date.

EM 145.59 Maintenance control procedures

This rule details the maintenance control elements of a maintenance organisation. These elements ensure that acceptable methods, techniques, and practices are assured at each step of maintenance including—

- supply, inspection, and testing
- control of maintenance activities
- contractual arrangements
- certification of release to service and issue of other documentation
- control of technical data and related documentation

Supply, inspection and testing

The organisation must establish procedures necessary to ensure the integrity of all parts, equipment, and materials used in the maintenance of aircraft. These procedures must ensure that all products used during maintenance meet the required specification and should include checks for correct in-coming release documentation, identification data, and physical condition. Segregation of serviceable parts and materials from unserviceable items must be established to ensure the integrity required and procedures for quarantining non-conforming items.

Maintenance activities

An organisation must have maintenance procedures to cover all aspects of its operation.

Certificated organisations are permitted to carry out certain work outside the premises which form part of their documented facilities. This flexibility allows them to meet the need for unscheduled maintenance which arises as the result of unserviceability. An organisation can also use this provision to accomplish scheduled maintenance of a minor nature away from the acceptable facilities. An example of this type of maintenance would be a short time-period AD compliance which occurs more frequently than the normal inspection cycle.

To gain this flexibility an organisation must have procedures to control the work to be carried out away from the established facilities. The procedures must ensure that the conditions under which such maintenance is carried out reproduce, as closely as possible, the conditions which would apply if the maintenance was carried out at the organisation's base location.

Contractual arrangements

A maintenance organisation providing maintenance services to an air operator on a contractual basis must establish procedures to manage those contractual obligations. The contract document and associated procedures should show how the operator contracts its tasks to the maintenance organisation and how responsibilities for maintenance are allocated between the operator and the maintenance organisation. The maintenance organisation's procedures should show how it complies with its contractual obligations in respect of the air operator's maintenance control system.

A summary of the items which may need to be addressed and the means of compliance with this rule in regard to contracts with air operators will be found in Appendix B.

A maintenance organisation must also establish procedures to control any maintenance carried out by subcontractors. These procedures need to define relative responsibilities and the mechanisms for extending the organisation's quality system to include the activities carried out by the subcontractor. Further detail on the use of subcontractors is provided in Appendix C.

Release to service

Details of the procedures for controlling the certification of release to service for aircraft and components should be specified in the exposition. These procedures should identify those persons or positions authorised to make the various certifications.

Technical data

Organisations must hold copies of all technical data which is necessary to maintain the types of aircraft or aircraft equipment for which they are certificated. This could include data which is issued by the CAA, any other aviation authority, the type certificate holder, supplemental type certificate holder, or other applicable design organisation. Any additional data that is identified in a type certificate holder's documentation should also be held.

Organisations must have procedures to ensure relevant airworthiness data is made available to all personnel who may need access to such data to do their work. The data must be available close to the work area and stored and presented so that staff can access it easily. When computer systems are used, the number of terminals must be adequate for the size of maintenance activity being carried out and the number of staff involved. When microfilm or microfiche readers or printers are used, the same requirement is applicable. There must be a procedure to control the amendment and distribution of the data.

Some examples of technical data which may be required to be held are—

- Civil Aviation Act 2000
- Civil Aviation Rule Parts 21, 39, 43, 66, 91 and 145
- Civil Aviation Rule Parts 121, 125 or 135 as applicable
- Advisory Circulars associated with 21,39, 43, 66, 91, 145, and 121, 125 or 135 as applicable
- Country of origin Airworthiness Directives and the PNG Register of ADs issued under Part 39
- Type Certificate Data Sheets
- Manufacturers' Maintenance Manuals
- Repair Manuals
- Overhaul Manuals
- Parts Catalogues
- Supplementary Structural Inspection Manuals
- Service Bulletins
- Modification Leaflets
- Non-destructive Inspection (NDI) and other specialised process manuals.
- Operators Maintenance Programmes

An organisation must establish procedures to monitor the amendment status of all data held, to ensure that all data are maintained to the latest amendment. Where an amendment service is available it must be subscribed to, and the associated procedure must ensure that all amendments are received and incorporated. Where revision data is obtained by subscription, then evidence of the supply contract should be controlled and made available.

An organisation must hold any data classified as mandatory by the Director.

If an organisation produces its own data there must be a procedure for producing and controlling it. This could be maintenance data that has been transcribed from other sources into the organisation's own format, such as customised worksheets, maintenance cards, or computer based data. To obtain the CAA's acceptance it is essential that accuracy of transcription is assured. There must be procedures for authorisation, production and checking of such documents.

EM 145.61 Authorisation procedures

This rule requires an organisation to establish procedures to issue company authorisations to

- perform maintenance on aircraft and components
- supervise maintenance activities
- certify release to service after maintenance
- certify conformity of major modifications and repairs
- perform any other certification function in the organisation.

The authorisation procedures form the cornerstone of the organisation's personnel control.

For issue of an authorisation to release an aircraft or component to service the rule requires the person to hold an aircraft maintenance engineer licence issued in accordance with Part 66.

For issue of an authorisation to certify conformity of major modifications and repairs, the rule requires the person to have completed a course of training relevant to modification and repair conformity and have passed an examination acceptable to the Director. The course of training and the associated examination run by the CAA for issue of an Inspection Authorisation issued under Part 66 satisfies this requirement.

The rule does not specify qualifications or other criteria to be met for the issue of an authorisation to perform maintenance, supervise maintenance, and make certifications other than release to service. These must be established by the organisation to reflect standards and procedures they wish to adopt for the maintenance activity involved.

Phases of authorisation

There are three phases to the authorisation—

- qualification, where the persons qualifications are assessed against the requirements of Part 145 and other applicable Parts
- training, where a person must have completed an acceptable course of training
- assessment, where that person is assessed for their technical competence to hold the authorisation and familiarity with organisational procedures.

Qualification

In most cases the appropriate aircraft maintenance engineer licence will indicate by its rating coverage the level of qualification of a person. In the case of personnel without a licence, the rule specifies the qualification required.

The organisation must define in its exposition, the level of experience and training required for the person to be competent to certify for a particular area of maintenance. The non-licensed personnel provisions are not intended to replace or override the normal licensing requirements and should, under no circumstances, cover the full scope and privileges of a licence. The provisions therefore apply only in the following circumstances—

- to authorise qualified persons to certify for maintenance other than releasing aircraft to service
- to allow unlicensed persons to certify for work of limited scope and of a repetitive nature

Training

Initial training may be carried out by the Part 145 organisation if the scope of approval allows such training, by a Part 141 training organisation, by the manufacturer, an organisation approved by the Authority of a foreign Contracting State, or a combination of these options. The Part 145 organisation will need to establish the curriculum and standards for training and the pre-qualification standards for training. Pre-qualification standards are intended to ensure that the trainee has a reasonable chance of successfully completing the course. Achievement of the required standard should be confirmed by examination at the completion of training.

Initial training should cover basic theory about the type of aircraft or equipment on which the trainee is to be employed. For certifying engineers, the training should be sufficient to lead to the issue of a type rating on the particular aircraft to be certified. It should also provide instruction on the relevant parts of the organisation's exposition, particularly lines of responsibility and maintenance procedures.

The organisation must establish procedures to ensure authorisation holders are given continuation training which includes instruction on any new aircraft types or changed maintenance methods, and any changes to an organisation's procedures as detailed in its exposition. Training programmes should be devised so that trained staff are readily available to take up certifying or supervisory positions as required. The temporary use of non-qualified staff to fill these positions, because of lack of available qualified staff due to illness, holidays, cessation of employment or otherwise, will not be acceptable to the CAA.

Assessment

An organisation must have procedures for assessing the competency of staff holding authorisations. These procedures should include assessment of qualifications, training received, and experience relative to the authorisations sought.

To be acceptable, planners, supervisors, certifying staff, and technicians should be assessed for competence by on-the-job evaluation, examination relevant to their particular role within the organisation and by reference to job descriptions.

For example an assessment should establish that—

- planners are competent to interpret maintenance requirements into maintenance tasks, and to recognise that they have no authority to deviate from the aircraft maintenance programme
- supervisors are competent to ensure that all maintenance tasks are carried out according to the relevant technical data, or to take appropriate reporting action where this is not done or where the particular maintenance task cannot be carried out
- certifying staff are competent to determine when an aircraft, or an aircraft component, is acceptable for release to service
- technicians are competent to carry out maintenance tasks, to the standard specified in the relevant technical data, and will notify supervisors of any difficult encountered or any additional discrepancies found while carrying out a task

Evidence of authorisation

The evidence of authorisation may take whatever form suits the certification system used by the organisation. It must be in a style which makes the privileges clear to both the authorised individual and to any authorised person who may be required to examine it. Where codes are used to define the scope of certification the interpretation document must be readily available.

Certifying staff are not required to always carry their authorisation, but they should be able to produce it within a reasonable time at the request of an authorised person. Authorised persons may be the organisation's quality assurance staff, maintenance supervisors, managers or authorised staff of the CAA. Other persons who may need to check the certification authority are the quality assurance personnel of another certificate holder when work is being carried out under contract.

EM 145.63 Continued airworthiness

The maintenance organisation has a responsibility to ensure that the products maintained are monitored in regard to investigation and analysis of defect incidents.

Defects that have no effect on safety, in any form, do not come under the definition of defect incidents and as such are not subject to this rule. These include defects which if corrected may aid production or make the item easier to use, resulting in an economic advantage to operating and maintenance organisations.

Defects that may result in injury, accidents, or hazards to other aviation activities are considered defect incidents. Under this rule, the maintenance organisation has a responsibility to keep the users of products which they maintain and the designer of those products informed of defect incidents.

The organisation must also establish procedures to ensure the defect reporting requirements of Part 12 are complied with.

The procedures required may form part of a totally integrated quality control system.

EM 145.65 Records

This rule requires the maintenance organisation to establish procedures to identify, collect, maintain and store records. These procedures should be documented in the exposition and subject to the quality assurance system.

Properly executed and retained records provide owners, operators, and maintenance personnel with information essential for the control of aircraft maintenance. These records are necessary to schedule maintenance in due time, to ensure maintenance is carried out to required standards, to correct defects efficiently, and to eliminate the need for re-inspection and re-work to establish airworthiness. Records are necessary to prove that all the requirements of Part 145 and other relevant Parts have been met and must be retained to provide evidence to that effect.

Maintenance records

Maintenance organisations must keep records of all maintenance work, which they have carried out, for five years from the date that work was released to service.

Maintenance records can be either paper or computer based or any combination of these. Paper systems must use robust material which can withstand normal handling and filing. Records may be microfilmed, photocopied, carbon-copied or magnetically copied for any purpose, but the original record must be retained for the required period and must remain legible throughout the required retention period.

Computer systems may be used to control maintenance, or to record and control details of maintenance work carried out, or both. General guidance for those using computer systems for recording maintenance is provided in Appendix A.

FAA AC21-35 contains more information on computerised record systems.

Staff records

A certificated maintenance organisation must establish procedures to ensure records are kept of all staff authorised to certify under its authority. The following minimum information should be kept in respect of each certifying person—

- name
- date of birth
- qualifications
- initial training
- continuation training
- experience
- qualifications relevant to the authorisation
- privileges of the authorisation
- date of first issue of the authorisation
- the expiry date of the authorisation
- identification number of the authorisation

The records may be kept in any format but must be controlled by the organisation's quality assurance senior person. Safeguards must be put in place to ensure that the records cannot be altered in an unauthorised way. Personal information must not be accessible to unauthorised persons. Organisations should take account of Privacy of Information legislation in the management of personal information.

The persons to whom the records relate should be given access, on request, to his or her own records. The CAA is an authorised person in respect of any aviation documents and records. When the CAA is assessing eligibility for initial or continued approval, or when it has cause to doubt the competence of a particular certifying person, it may access those records.

An organisation should keep the records for at least five years after the individual has ceased to be in its employment, or after withdrawal of the authorisation, whichever is sooner. In addition certifying persons, on

leaving an organisation, must be provided with a complete record of company certification authorisations which they have held.

Operator's records

Operators and maintenance organisations are required to retain maintenance records for different reasons, and thus for different periods. Aircraft operators must retain records which define the maintenance history of the aircraft for the life of the aircraft. This includes the records of any component fitted to the aircraft.

The operator must keep, for the lifetime of the aircraft, records of—

- the total time in service of each airframe, engine, propeller or rotor
- the status of life limited parts of each airframe, engine, propeller, rotor or other aircraft component
- the time since last overhaul of all items installed on the aircraft which are required to be overhauled on a specified time basis
- the inspection status of the aircraft, including the time since the last inspection required by the maintenance programme under which the aircraft and its components are maintained
- the status of applicable airworthiness directives (AD), including the method of compliance, the AD identification and revision date. If the AD is repetitive, the time and date when it is to be next accomplished
- records of all modifications or major repairs made to the airframe, its installed engines, propellers, rotors or other aircraft components
- records of all routine inspections carried out and rectification of defects

The maintenance organisation must establish procedures to ensure this information is passed to the aircraft operator to ensure that operator is able to meet their obligations in regard to records.

Storage of maintenance records

The maintenance organisation should establish procedures to ensure the records required to be maintained under this rule are protected from fire, flood, falsification and theft. As a minimum precaution the records should be stored in lockable and fireproof metal containers or in a fireproof room. Computer back-up disks or tapes should be stored in a different location to that containing the working disks or tapes. Tapes should be protected from demagnetisation. The base records used to create the computerised records need to be secured from loss.

When a Part 145 certificated organisation permanently ceases its maintenance activities, all retained maintenance records covering the last five years shall be distributed to the last operator of the aircraft or component. If it is impossible to trace the operator then the records shall be stored as directed by the CAA.

Lost records

Organisations must have adequate systems to secure and protect records. However, lost or destroyed records can be reconstructed by—

- reference to other records which reflect the time in service
- research of records held by other maintenance organisations
- reference to records maintained by individuals

When these things have been done and the records are still incomplete, the owner or operator should make a statement in the new record describing the loss. The best estimate of the time in service should be established based on the research carried out. The reconstructed records should be submitted to the CAA for acceptance. The CAA may require further maintenance to be carried out before acceptance of the

reconstructed records.

EM 145.67 Internal quality assurance

An applicant must establish an internal quality assurance system that meets the requirements of this rule.

The requirements of this rule are common to all certificated organisations which require an internal quality assurance system, for example all the organisations to which the 140 series and 170 series Parts apply.

Detailed information on what is required for an internal quality assurance system is contained in PNG AC 10-1.

EM 145.69 Maintenance organisation exposition

This rule requires an applicant for a maintenance organisation certificate to establish an exposition.

The purpose of an exposition is to express the Chief Executive's requirements for the conduct of the organisation, to set out the means by which an organisation defines its operation, and to show both its employees and the CAA how it will conduct its day-to-day business in compliance with Part 145.

An exposition must assure the CAA that the organisation is in documentary compliance with the rule. Hence before the CAA grants an organisation entry into the system, the exposition must be accepted by the Director.

Makeup of exposition

An exposition may be produced as a single volume or any number of separate manuals. Depending on an organisation's structure and size, separate manuals could cover—

- Management and Policy
- Personnel
- Maintenance Procedures
- Stores
- Document control
- Quality Assurance
- Contractual Arrangements with Air Operators.

If the exposition comprises more than one volume, the make up of the exposition and the content of individual manuals must be described in the management part of the exposition.

Procedures should be established to ensure Managers hold copies of those parts of an exposition which affect their areas of responsibility and staff are familiar with those parts of an exposition which affect their area of employment.

Content

The exposition should be constructed to address each element of 145.59. The structure should reflect the hierarchy of Part 145 such that the exposition progressively moves from higher level organisational material such as policy, scope of approval, and duties of senior persons to more detailed procedures.

Structuring the exposition according to the flow of the rules in Part 145 should be avoided, the result will not be a user friendly document.

The level of detail should be consistent with the size and complexity of the organisation and the maintenance activity undertaken.

Exposition acceptance

The acceptance of an organisation's exposition by the Director will be one step in the process of Part 145 approval. Unless an exposition is accepted by the Director, a Maintenance Organisation Certificate cannot be issued. Evidence of acceptance of the exposition is the issue of a Certificate, however the CAA will normally stamp the log of pages to signify that they have found the exposition acceptable at a particular status.

Multiple certification

When an organisation seeks certification under more than one Civil Aviation Rule Part each of which requires an exposition, it may be possible for some parts of the exposition to be common to each certificate. For instance, if the same management set-up is used for each certificate, the management and policy part of the exposition could be common. Equally all of the quality assurance procedures for one or more certificates could be placed in one manual.

Whatever format of exposition is chosen, it must be possible to clearly show how the requirements of each Part are satisfied. It is desirable that a compliance matrix is provided showing where compliance is shown in the exposition for each Part. This matrix should distinguish between those requirements which are common and those which are specific.

Any difficulty in establishing compliance will require more investigation time to be expended, and can only result in delays and additional cost to an applicant.

Subpart C — Operating Requirements

EM 145.101 Continued Compliance

To ensure that all members of the organisation have access to the exposition, a certificated organisation is required to provide copies of its exposition at all places where work is normally carried out.

For continued compliance with the conditions of its Part 145 certificate, the organisation must comply with all the procedures detailed in the exposition and continue to meet the standards and conditions, which were required for initial certification.

The organisation must also comply with any reasonable requests from the Director to undergo audits and inspections. The Director is empowered by the Civil Aviation Act to make such requests.

The CAA operates a safety audit programme for all participants in the aviation system. For large organisations the safety audit programme will normally be agreed between the CAA and the organisation at the time of issue of the certificate. The programme will be reviewed each year to agree the following year's programme.

For smaller organisations the safety audit will be part of the total industry safety monitoring schedule and visits will be notified in advance. These arrangements will allow for forward planning by both the CAA and the certificated organisations.

Additionally, random checks of aircraft and documentation at aerodromes, flight lines, and maintenance bases will sample the industry's safety performance.

An organisation's policy and procedures will be accepted by the CAA during the entry process. These policies and procedures, documented in the organisation's exposition, will form the agreed performance standard for an organisation's safety audit programme. This safety audit programme will initially examine the certificate holder's internal quality assurance system. Any deficiency found at this level will result in a broader and deeper investigation until the causal factors of the deficiency are identified. The on-going frequency and depth of audit will depend directly on the performance of the organisation.

The CAA's level of confidence in an organisation will be raised when it is found to comply with its documented procedures. The CAA can then consider reducing the frequency and depth of the audit programme, with consequent financial savings for the organisation. Conversely where the level of confidence is low, due to non-compliance, the level of auditing and the consequent cost to an organisation may be expected to increase. Whenever it is discovered, through an audit or other reporting method, that an organisation is not

conforming with its procedures, or complying with the Part 145 rules, the Director may suspend or revoke the certificate.

EM 145.103 Changes to certificate holder's organisation

A certificated organisation must always ensure that its exposition continues to be an accurate description of its activities. When it makes changes to its personnel, structure, location, or documented procedures, it must ensure that the exposition is amended to take account of the changes. It must ensure that its exposition is amended promptly, and that an amendment service is provided to all exposition holders, including the CAA.

Changes requiring prior approval

An organisation must put in place procedures to ensure that, before any of the changes listed in rule 145.103(d) occur, prior acceptance of the CAA has been gained. The CAA may then prescribe conditions to be applied, either during the change-over period, or permanently, if it does not consider that the new conditions will achieve the same level of safety.

These transitional conditions allow an organisation to continue to operate while not fully meeting the conditions of its approval. It can then negotiate with the CAA the permanent changes which are needed. Without this dispensation the approval would be effectively invalidated as the company would no longer comply with its exposition and thus not comply with the other requirements of Part 145.

The CAA may, at any time, require the organisation to amend its exposition if it considers that this is necessary in the interests of safety.

To summarise—

- an organisation may make changes to its exposition to reflect changes in its operating procedures.; amendment of its exposition is accepted as notification to the authority; and
- certain designated changes require prior acceptance by the CAA; and
- the CAA may require the organisation to make changes to its exposition if such changes are considered necessary in the interests of safety.

A situation may occur where a certificated maintenance organisation is unable, through temporary loss of facilities, equipment or personnel, to maintain the conditions under which it was certificated. As long as the situation is temporary, and the organisation makes a commitment to the CAA not to carry out maintenance for which it no longer has the necessary resources, the CAA will not move to amend or revoke its certificate.

Appendix A - Computerised Maintenance Records

This Appendix gives guidance on the use of computer-based records in the recording of aircraft maintenance data. It provides information on the matters to be considered when writing procedures for the use and control of computer maintenance records. To maintain the integrity of maintenance records when computers are used to record some or all of the information, the following guidelines must be considered—

- To avoid data loss in the case of power interruptions the computer system must be protected by design features which can recover data lost by such power outages. The design features may be hardware – uninterruptable power supplies – or software, or may be part of the procedures for use
- Software procedures should be documented to make allowance for the effects of power surges and complete shutdowns. Some re-entry of data will be allowed in the recovery procedures
- The data contained within the system should be protected from unauthorised access by a security system which prevents access to the database software and the computer hardware or both. The software security system should record and report unauthorised access or attempts at access. Such recording would normally be software based, but it may be a procedural item for human users. The security system may be physical security where an individual PC is used which can be locked away
- Where available, the database should incorporate an audit trail which records all programme and data manipulation. Where an audit trail facility is not built-in the procedures should include instructions to maintain data integrity. Such instructions may be as extensive as rebuilding the database from real data from the last good back-up made
- Copies of all data records should be retained at a secure location for the period that similar records are required to be retained in a paper-based operation
- The process of entering data should be verifiable against the original record. Such verification could be as simple as the operator being able, and required, to validate the screen image, or as complex as independent quality control procedures. The verification procedures will be stricter for larger systems
- A system operation manual should be made available to all persons authorised to operate the system. The manual should nominate the person within the organisation who has responsibility for the management of the computer system. The manual should have a technical reference to the hardware and the software and detailed operating procedures, based on daily operations, for every keyboard operation or other input. The manual should detail and standardise all abbreviations and acronyms used. The organisation should restrict the use of abbreviations and acronyms to those published by the Air Transport Association of America (ATA)
- The system should include provision for the recording or storage of amendments to an acceptable aircraft maintenance programme. This historical record will, upon retrieval, provide a complete chronological history of the system of maintenance and recording. Failing that, a back-up of the operating system and the data is to be made and held for the required life of the associated recorded data
- A back-up disk or tape of the data should be produced, as a minimum, once every day that the system is operated. Those systems which record every keystroke may be able to justify a lesser back-up frequency. A back-up of the operating software should be held at a separate location. When changes to the operating system software are made, the old system back-up is to be kept for the life of the recorded data that was associated with that operating system
- The back-up tape or disk should be stored in a secure location remote from the system installation. Access to the back-up should be controlled. The recommended regimen for back-up of data is that a daily back-up is made of the data and held for 14 days. The back-up for each of the thirteen days can then be overwritten in order. The back-up for the fourteenth day is kept for at least 12 weeks before re-use
- Where the system includes periodic dumping of data, held on consolidated disks for storage, the system operations manual should include procedures which ensure that the system software is not corrupted
- Work cards produced by the system should—

- identify the level of authorisation required for certification purposes
- be identified and controlled individually and as asset up until the time that they are issued
- be controlled and accounted for by the end of the maintenance activity
- The normal testing period for a new computer system will depend on the complexity of the system. During the testing period the traditional hard copy documentation should be maintained concurrent with the computer system
- A register should be established containing a list of all—
 - problems
 - subsequent actions
 - solutions encountered during the life of the computer system. During the testing period the entries in the register should be used to evaluate the validity of the predetermined end of testing date

FAA AC21-35 contains more information on computerised record systems.

Appendix B - Contracts With Air Operators

Introduction

Appendix B details the procedures which should be followed when an air operator arranges with a maintenance organisation for that organisation to carry out some or all of its maintenance tasks. This information will be of use to maintenance organisations certificated under Part 145 and wishing to carry out contracted maintenance tasks for air operators.

Responsibilities

The aircraft operator is responsible for all aspects of the maintenance of the aircraft, including both planning and carrying out the maintenance. This includes responsibility for—

- properly planning all necessary maintenance
- providing adequate documentation, such as operator's maintenance manuals, aircraft maintenance, repair and parts manuals, maintenance schedules and associated recording documents, necessary, to ensure that the planned maintenance can be properly carried out and recorded
- providing aircraft reliability programmes, and control of development of maintenance schedules
- airworthiness occurrence control including reporting and control of defects
- complying with all applicable airworthiness directives
- assessing, and actioning as appropriate, all manufacturers' service bulletins or other service recommendations
- providing adequate and trained technical and other staff so that the maintenance can be properly carried out
- providing adequate accommodation, equipment, tools, and facilities so that the planned maintenance can be properly carried out
- providing, accepting, and storing aircraft spares
- making the aircraft available to the persons who are to perform the maintenance whenever maintenance is due and giving adequate technical direction for all work to be carried out
- carrying out necessary servicing of aircraft and aircraft components
- completing all required flight records and logbooks and actioning any entries which require such action
- maintaining all aircraft documents such as aircraft flight manuals and associated minimum equipment lists at the current status

The operator may choose to contract other persons or organisations to carry out any or all of the above tasks. However, contracted arrangements for accomplishing these tasks do not absolve the operator from the final responsibility for ensuring the safe operation and continuing airworthiness of the aircraft.

General conditions

When establishing a contract between an air operator and a maintenance organisation to carry out any of the above listed tasks the following general conditions should be considered—

- The air operator will be responsible for satisfying the CAA that the maintenance organisation is able to satisfy the terms of the contract
- A formal agreement should be established between the two parties in accordance with this advisory circular defining which functions are to be contracted. This agreement should form a part of the exposition of each party

- The operator must nominate a senior person from within the company to liaise with the contracting organisation on contract matters
- The Operator's internal quality system should have responsibility for auditing the performance of the contract organisation in respect of the contracted tasks
- An arrangement by which more than one maintenance organisation is nominated by an operator in respect of a particular aircraft type will not normally be acceptable to the CAA, other than for tasks carried out at route stations
- In its assessment of the arrangements made by the Operator for the sub-contract of any of the listed tasks, the CAA may require to examine all technical agreements between the parties. The contract should form a part of the exposition of each organisation
- Any proposal to significantly change the contract or technical agreements requires the prior acceptance of the CAA and should be notified as soon as practicable. This could be, for example, an intention to change to another maintenance organisation, or a significant organisational, procedural or technical change to an agreement. Delayed notification may result in the changes not being processed in time for the intended date of change

Contracting to a foreign organisation

Where an air operator wishes to contract all or part of its maintenance tasks to a foreign maintenance organisation not holding Part 145 certification, the following items should be considered—

- A formal agreement should be established between the two parties, in accordance with this advisory circular, defining which tasks are to be contracted

Where the arrangements provide only for rectification of defects at route stations, a formal maintenance agreement need not be established.

- The maintenance organisation which is to be used should be acceptable, for the tasks to be contracted, by the Responsible Authority of an ICAO Contracting State
- The national airworthiness standard, under which the maintenance organisation has been accepted, must be known by the CAA to be comparable with that existing in PNG
- The arrangements should provide for the CAA to inspect the facilities at any of the nominated locations if it makes a request to do so
- Details of the proposed maintenance arrangements should be forwarded to the CAA for acceptance. The operator's exposition should be amended to include this information
- The method of certifying individual maintenance tasks and the responsibilities of nominated signatories must provide equivalence to PNG certification requirements. The signatories should be persons employed by the foreign maintenance organisation
- All work must be completed and certified in accordance with the PNG air operator's exposition
- All necessary maintenance manuals or equivalent technical literature should be provided

Detailed content of the maintenance agreement

The formal written agreement should consider the following items, as appropriate for the particular arrangement—

- Organisational Structure – The general divisions of responsibility between the two parties for the overall support of the aircraft, compliance with statutory regulations and other relevant requirements
- Co-ordination between the two parties – Contact points for the interchange of airworthiness matters
- Responsibilities for any secondary authorisations and sub-contracted tasks such as NDT, aircraft weighing or painting

- Provision of adequate numbers of suitably trained and qualified engineering personnel
- Planning of maintenance manpower allocation and control
- Procedures for developing and carrying out reviews and amendments to the maintenance schedule. Arrangements for authorising schedule variations
- Preparation of documentation needed to implement schedule requirements
- Procedures for the assessment and incorporation of Service Bulletins, modifications and manufacturers technical programmes
- Management and operation of reliability programmes
- Provision of covered accommodation for aircraft undergoing maintenance
- Provision of tools and equipment for scheduled and unscheduled tasks
- Component and material control – The provision of spares, their source, acceptance and storage. Particular attention must be paid to the provision of replacement parts and components for defect rectification
- Control, distribution and amendment of technical manuals, publications and drawings
- Compilation and control of technical records, compliance with Airworthiness Directives, component life control, and completion of logbooks
- Defect control and management – Control of deferred and repetitive defects
- Arrangements for line station support and the rectification of defects away from base
- Provision of Engineering Instructions, management and technical
- Airworthiness occurrence control and reporting
- Responsibilities for quality assurance, definition of the quality assurance programme. Responsibilities of both parties for effective follow-up of QA reports
- Operators name and Air Operator Certificate number. Name and CAA certificate number, if any, of the sub-contracting organisation
- Title and reference number of the Exposition or Engineering Manual in which the sub-contracting arrangements are described

Written agreements should clearly defined what responsibility for action is allowed to the maintenance organisation without prior consultation, and what tasks require operator agreement.

Whenever an aircraft is presented for scheduled or unscheduled maintenance, it is essential that a precise indication is given of the inspections required. All known defects must be documented, together with any additional work required – after consultation with the maintenance organisation as necessary.

Appendix C - Maintenance Organisation Subcontracting

Introduction

Appendix C gives an acceptable means of complying with the requirements of Part 145 when work is carried out for the Part 145 organisation by a sub-contracting organisation or person not certificated in accordance with Part 145. This work is considered to be an extension of the work carried out by the Part 145 organisation and under the control of its quality management system. The responsibility for providing the necessary documentation for all maintenance carried out and authorisation of staff certifying that maintenance rests with the contracting Part 145 organisation.

General conditions

The following general conditions apply for sub-contracted maintenance—

- When maintenance is carried out under the sub-contract control system the Part 145 certificate has been temporarily extended to include the sub-contractor for the duration of that maintenance. Those parts of the sub-contractor's facilities, personnel, and procedures, involved with a certificated Part 145 maintenance organisation's products must meet Part 145 requirements for that time
- Any maintenance organisation certificated to Part 145 may sub-contract maintenance to a non-certificated organisation provided that there is provision in its exposition for such sub-contracting
- A Part 145 maintenance organisation does not need to have its own facilities to carry out all maintenance that it wishes to sub-contract. It does need to have its own expertise to decide that the sub-contractor meets the necessary standards and that any maintenance is carried out to the acceptable maintenance instructions
- A Part 145 maintenance organisation may find it necessary to include in its documentation several specialist sub-contractors to enable it to be acceptable to maintain a particular product. To approve such a sub-contract the Director will need to be convinced that the Part 145 maintenance organisation has the necessary expertise and procedures to control such sub-contractors

Examples could be specialist welding, specialised plating, painting or non-destructive testing.

- A Part 145 maintenance organisation is responsible for all maintenance carried out by its sub-contractors. Where a Part 145 organisation fails to control a sub-contractor it may put at risk part or all of its own Part 145 certification
- The extent of sub-contracting is only limited by the expertise and procedures of the Part 145 maintenance organisation
- Approval to sub-contract is shown by the Director accepting the exposition containing a specific section on the control of sub-contractors and a list of the sub-contractors

Procedures

Where procedures for the control of sub-contractors are being created, the following items should be considered—

- A pre-assessment procedure under which the certified organisations' sub-contract control section should visit a prospective sub-contractor

This visit will determine whether those parts of the sub-contractor that it wishes to use meet the requirements of Part 145 before any maintenance is placed with the sub-contractor.

- A procedure to ensure the upgrade of the relevant parts of the sub-contractor to meet the intent of Part 145, if the contractor does not meet the requirements
- An assessment of the extent that the Part 145 maintenance will use the sub-contractor's facilities

Usually the Part 145 certificated maintenance organisation will require its own paperwork, maintenance instructions, material and spare parts to be used. It may permit the use of tools, equipment and personnel from the sub-contractor as long as such tools, equipment and personnel meet the requirement of Part 145.

- Where the product can be fully inspected on receipt, procedures for the Certificate of Release to Service to be issued by the certifying staff of the Part 145 organisation
- Where the product cannot be inspected on receipt, procedures for inspection during production at the sub-contractors facility

The product may not be able to be inspected on receipt, either because there are intermediate inspection stages or because the component is complex. The Quality Assurance function of the Part 145 organisation must be transferred into the sub-contracting organisation. Such activities should be fully explained in the exposition to show that there is adequate control of the process.

- Where inspection and certification are carried out at the sub-contractors facility, procedures for the Certificate of Release to Service to be issued either by staff of the contracting Part 145 organisation or of the sub-contractor

Certifying staff in either case must be qualified and authorised by the contracting organisation following the procedures in its exposition.

- Procedures for the control of sub-contractors, to record visits to sub-contractors, to have a corrective action follow-up plan, and to show when sub-contractors are being used
- Procedures for the audit of the sub-contract control section and sample sub-contractors by the Part 145 maintenance organisation's quality assurance staff

The contract with sub-contractors should make it clear that the right of CAA staff to carry out a safety audit of the certificated organisation applies equally to any listed sub-contractor.