CHAPTER 38

EVALUATION OF CATEGORY I/II/III LANDING MINIMUM MAINTENANCE/INSPECTION PROGRAMMES

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1.0 OBJECTIVE

This section provides guidance for evaluating and accepting applications for lower approach and landing minima in respect to the appropriate support programme. Reference: ICAO Annex 6, Chapter 1. Nig. CARs Part 7.2.1.6, 7.2.1.7; CL:O-AWS038;

GENERAL

A. Responsibilities

(1) The Airworthiness Aviation Safety Inspector (ASI) will provide technical support to the Operations ASI and the applicant. The responsibility for monitoring all applicants during the evaluation period should be coordinated between the Avionics and Operations ASIs, to include:

- Approvals
- In-flight evaluation observations
- Surveillance

(2) It is the applicant's responsibility to obtain and submit all documents that establish the eligibility of its aircraft, such as:

- The required maintenance/inspection programme necessary for continued eligibility.
- The applicant's Minimum Equipment List (MEL), with the limitations for Category I operations, if applicable
- An acceptable means for maintaining the reliability of the flight guidance control and associated systems.

B. Qualifications for Low Approach Landing Minimums.

Low approach landing minima are issued to qualified operators operating under the Nigeria CARs. While the operating rules for each of these authorizations may vary significantly, the approved guidelines do not. Approval for low or minima approaches in all categories will require compliance in the following three major areas:

- Airborne equipment and systems
- Flight crew and maintenance personnel qualifications
- Lowered minimum procedures, including a maintenance/inspection programme.

C. Deviations. Commitments to deviations should not be made without coordination between the Airworthiness and Operations ASIs. All requests for deviations must be forwarded to the Director, Airworthiness Standards and Director, Operations and Licensing Standards, by the Operations ASI. The applicant should be advised not to proceed in operating under its lower minimum proposal until the deviation request is resolved.

3.0 CATEGORY I OPERATIONS

The Airworthiness Inspector's responsibilities for Category I authorizations are primarily limited to the evaluation of the flight director and/or auto pilot systems. The assigned Operations Inspector is responsible for determining the overall suitability of an operator's Category I capabilities.

CATEGORY II EQUIPMENT APPROVAL FOR AIRCRAFT CERTIFICATED WITH 9 OR LESS PASSENGER SEATS

A. Lower Approach Minimum Approval. An application for lower approach minimum authority should specify the basis for the aircraft approval to conduct lower minimum approaches. This authority may be based on:

(1) Type certification and the Airplane/Rotorcraft Fight Manual

(2) Supplemental type certification

(3) Any acceptable combination of the above

B. Requirements for Category II Approval

(1) Requirements for Category II approval for general aviation operators should specify:

- Required instruments and items of equipment
- Methods of approval
- Evaluation programme conduct
- Calibration standards
- Maintenance/inspection programmes

(2) ICAO DOC. 9365, or the U.S. -FAA Advisory Circular 91-16, Category II Operations-General Aviation Airplanes, as amended, is available to assist operators in developing and obtaining approval of Category II equipment installations and maintenance/inspection programmes.

C. Operational Evaluation Programmes. Manufacturer's engineering coordination should be requested when necessary, particularly for those aircraft in which the functions and limitations of the automated systems are significant factors for safe operations.

D. Flight Director Systems. ASIs should be aware that single flight director systems with dual displays in which the second display repeats only the ILS information on the pilot's display will not meet the requirements for two ILS receiving systems.

E. Optional Avionics Equipment. Optional avionics equipment installed by the operator will be referred to an authorized engineering source for evaluation. The engineering evaluation can assist in determining if flight-testing is required, what limitations may apply, and whether or not the installation may require a Supplemental Type Certificate. If a Supplemental Type Certificate from the regulatory authority of aircraft manufacturer is required, avionics personnel will assist in the accomplishment of a compliance and conformity inspection, as necessary. Optional equipment that may be installed and require approval include the following:

- Flight director systems
- Automatic throttle control systems
- Auto pilot and approach coupler systems
- Speed control command systems
- System faults detection and warning systems
- Radio altimeters

NOTE: An authorized engineering source may be the engineering department of an aircraft manufacturer or a designated engineering representative certificated by the regulatory authority where the aircraft was manufactured.

F. Alterations: Proposals to alter installed avionics equipment required for a particular category of operation should be carefully reviewed and handled in accordance with established procedures. Each proposal should be evaluated for its effect on system performance, compatibility with the original standard, and compliance with Category II criteria.

(1) When manufacturer-proposed alterations to existing avionics equipment appear to be major, verify the approval status before sanctioning incorporation of the change by the operator. If approval from the manufacturer's regulatory authority for the alteration is not clearly indicated in the manufacturer's instructions, the operator should obtain such approval before performing the alteration.

(2) An ASI should exercise a cautious approach to field approval of alterations. Pressure from any source should not discourage the ASI from verifying that the alteration is being made in accordance with approved technical data and that the technical evaluation is clearly within the scope of the ASI's training, experience and approval authority.

(3) Alterations originating in an operator's engineering department should also be examined carefully and, when necessary, referred to an authorized engineering source.

CATEGORY II-III EQUIPMENT APPROVAL FOR AIRCRAFT TYPE CERTIFICATED FOR 10 OR MORE PASSENGER SEATS

A. Large Aircraft Criteria: Operators using large aircraft should meet all of the requirements that are outlined in ICAO DOC. 9365, or U.S. -FAA Advisory Circular 120-28C. Criteria for Approval of Category III Landing Weather Minima, as amended, or 120-29: Criteria for Approving Category I and Category II Landing Minima for Operators, as amended.

B. Turbojet Criteria: All operators using turbojet aircraft must comply with the aircraft systems evaluation criteria that apply to large aircraft operators. Applicants using turbojet aircraft should also use the aircraft equipment evaluation standards outlined in or the U.S. - FAA Advisory Circular 120-28C or 120-29.

C. Systems Evaluation Approval: Systems evaluation approval should be accomplished in accordance with the U.S. -FAA Advisory Circulars 91-16, 120-28C, or 120-29, as applicable.

D. The aircraft requirements for Category III authorization include requirements for the total aircraft performance and associated systems. The acceptance of an aircraft for this category must be completely based on performance and data approved by the regulatory authority where the aircraft was manufactured.

(1) Upon receiving an operator's request for Category III authorization, the assigned Airworthiness Inspector should immediately contact the type certificating authority where the aircraft was manufactured. This action is to determine whether the aircraft has been approved for such operation and what equipment and systems have been approved. If the aircraft has not been Category III certified, the ASI should request assistance from the appropriate type certificating authority so that an application for a Supplemental Type Certificate can be properly consolidated.

(2) The U.S. FAA Advisory Circular 120-28C, as amended, outlines the requirements for the maintenance programme. The nature of this type of operation will necessitate a detailed evaluation supported by well-defined

maintenance, training, and reliability programmes. All maintenance and reliability supporting documents become part of the accepted programme.

(3) The initial programme should also include appropriate programmes identified in the Maintenance Review Board document. The frequency of maintenance actions may be revised when sufficient experience has been gained to justify a change and when there is no conflict with the certification requirements.

(4) The reliability of systems and/or components set forth as substantiation for the Category IIIa certification becomes the performance criteria for the programme.

(a) Controlled monitoring of Category III system reliability will require that the operator, after initial evaluation, incorporate the pertinent systems and components into the approved reliability programme. If the Category III system reliability exceeds the approved programme, the operator should be allowed a reasonable time period in which to improve the reliability.

(b) The type certificating regulatory authority's Engineering Office should be advised when the monthly removal rate is exceeded and informed of the probable cause. The reliability reporting is a necessity, particularly when operational approval was predicated upon probability analysis.

(5) The maintenance manual should identify all special techniques, maintenance/inspection frequencies, and test equipment requirements to support the programme. It should also specify the method of controlling the operational status of the aircraft. Those technicians qualified to release an aircraft for Category III must be identified.

(6) An approved training and recurrent training programme must be provided. The listing of such personnel must be current. Only those persons trained and qualified should be permitted to perform Category III maintenance/inspections.

(7) The operational demand for Category III airborne systems with exposure to numerous hidden functions requires that the aircraft be either periodically exercised or functionally checked. This is to ensure that all systems are operational and that no dormant failure has occurred. The initial programme should provide either a periodic Category III approach or periodic system functional check.

(8) Until sufficient experience and data is available (excluding the six month's demonstration), it is recommended that the aircraft status period does not exceed 35 days. Failure to exercise the system by simulated Category III approach or functionally checking the system within 35 days should

automatically place the aircraft in a non-Category III status. The aircraft must contain this status until the required functional check is made.

PROGRAMME DEVELOPMENT

A. Initial Development. At the time of formal application, the ASI should begin to monitor development activity. Participation in all meetings with an applicant will usually require coordination with the Operations ASI. It is important for the operator to include all key personnel in any meeting.

B. The Operator's Lower Minimum Programme**.** The operator's lower minima programme must be developed and the procedures used during the evaluation period. Operations Specifications Part D must reflect all special Category II maintenance requirements that were developed to support repetitive evaluation of Category II systems and equipment.

CATEGORY II MAINTENANCE MANUAL REQUIREMENTS

A. The maintenance manual should identify all special techniques, maintenance/inspection frequencies, and test equipment requirements that support the programme. Those technicians qualified to release an aircraft with lower minima should be listed or identified.

B. The operator's procedures must include a method for manual distribution to ensure availability to the appropriate maintenance facility.

C. Operators should be encouraged to show the method of approval of required equipment as listed in the maintenance portion of the manual.

MAINTENANCE/INSPECTION PROGRAMMES

The proposed maintenance/inspection programmes must be tailored to the applicant's operations and maintenance organization. All maintenance and reliability supporting documents become part of the accepted programme.

A. Requirements for Maintenance/Inspection Programmes. ICAO DOC. 9365, or the U.S. FAA Advisory Circulars 120-28C and 120-19, as amended, outline the requirements for the maintenance /inspection programmes. Maintenance/inspection programmes must provide for the proper maintenance and inspection of equipment and aircraft systems.

B. Control and Accountability. Emphasis must be placed on control and accountability of all areas associated with lower landing minima approval. These areas primarily encompass the following:

- Initial and recurrent training on flight guidance control systems
- The use of test equipment

- The difference in aircraft systems between aircraft in an operator's fleet.
- Special procedures for airworthiness release and control of the aircraft approach status.
- Initial and recurrent training in all areas of the lower minima programme
- Training for new personnel and equipment types.

C. Operational Status of the Aircraft. The method for controlling the operational status of the aircraft lower minimum required equipment must ensure that flight, dispatch, and maintenance personnel are kept aware of the current status.

D. Purchase of Avionics Equipment "Package" Installations. General aviation maintenance/inspection programmes may be developed by some manufacturers and repairs stations in conjunction with their Category II avionics equipment installation "package". The contents of such programmes should be thoroughly evaluated for compliance and maintainability with Category II regulations.

E. Re-qualification Procedures. The programme must include procedures for re-qualification of an aircraft for lower minimum following maintenance on any required system. This must include tests after replacements, resetting in rack, and interchange of components.

F. Approval. The ASI will indicate approval of the maintenance programme portion of the operator's Category II manual by signing and dating each page of the programme.

9.0 MAINTENANCE TRAINING PROGRAMMES

Airworthiness Inspectors, during the course of normal surveillance should evaluate the maintenance facilities performing Category II equipment maintenance to ensure that the training provided meets the requirements of lower minimum standards.

EXISTING MAINTENANCE/INSPECTION PROGRAMMES

A. Programmes can be developed to be compatible with the existing maintenance/inspection programme, as long as there is a clear distinction between normal and lower minimum requirements.

B. When an operator's proposal is based on an existing maintenance/inspection programme, the ASI must ensure that all procedures will provide for the lower minimum programme requirements. Caution should be exercised when an applicant has used a programme approved for use by another operator for developing its own.

C. The following areas of the proposal and existing programmes should be closely reviewed:

- The existing reliability programme
- The training programme
- The initial evaluation checks for existing aircraft and for new aircraft.
- The existing parts pool, borrowed parts procedure, and control of spare parts.

D. Existing Reliability Programmes. An operator's existing reliability programme may be accepted when shown to be adequate for its lower minimum operations.

TEST EQUIPMENT AND STANDARDS

A. Performance Standards, Tolerances, and Calibration Procedures

(1) Performance standards, tolerances, and calibration procedures applicable to ILS equipment have been adequately covered by:

- Technical Standard Orders (TSO)
- Radio Technical Commission of Aeronautics (RTCA) documents
- Manufacturer's instruction manuals

(2) These standards or their equivalent are generally considered acceptable for inclusion in maintenance/inspection programmes for equipment operated to landing minima of 220-1/2 (Category I). Such standards may not be adequate for Category II. Those which will not provide category system performance should be revised to provide the required level of performance.

B. Category II Tolerances. In many cases, the tolerances for Category II airborne equipment are more rigid than those for Category I. Therefore, the equipment used to inspect, test, and bench check Category II equipment may require more frequent test and calibration.

C. Established Standards and Tolerances. Standards and tolerance established in the maintenance/inspection programme for testing and calibrating airborne equipment and systems that are required for Category II operations should not be relaxed following programme approval without adequate substantiation that system performance will not be degraded.

D. Self-Test Features. Self-test features may be used for periodic inspections if:

(1) They have been evaluated and found to adequately test the system.

(2) Instructions for their use and interpretation of self-test indications are included in the maintenance/inspection programme portion of the

Category II manual. Inclusion in the approved maintenance/inspection programme will indicate NCAA approval.

MAINTENANCE PERIOD EXTENSIONS - GENERAL AVIATION

A. Application for Extensions

(1) Applications for extensions of maintenance periods for general aviation operators may be considered at the completion of one maintenance cycle of at least 12 calendar months. Application should be made by letter to the NCAA.

(2) The following factors are considered in granting an extension:

- Records of Category II approaches due to malfunctioning equipment
- Number of Category II approaches (actual and simulated).
- Maintenance records of Category II equipment failures.
- Service history of known trends towards malfunctioning
- Unit mean time between failures
- Records of functional flight checks

B. Check, Test, and Inspection Extensions. Extensions to the check, test, and inspection periods may be granted if factors indicate that the performance and reliability of the Category II instruments and equipment will not be adversely affected. General Aviation extension periods, in most cases, would be one calendar month for tests, inspections, and functional flight checks, and four calendar months for bench checks. The operator's programme should include procedures for obtaining the extensions.

C. Increased Extension Periods. The extension periods suggested in paragraph B may be increased at the discretion of the Avionics ASI.

13.0 FUNCTIONAL FLIGHT CHECKS

Some operators have submitted programmes that provide for functional flight checks. This procedure must not be approved unless all airworthiness requirements have been satisfied before dispatch. In no instance can a functional flight check be substituted for the certification by maintenance of complete systems or equipment operation.

REPORTS AND RECORDS - GENERAL AVIATION

A. Responsibilities of Record Keeping. The persons responsible for these reports should be provided training in appropriate parts of the proposed lower landing minimum programme.

B. Category III or any Auto land Category. Operators authorized for Category III, or any Auto land category, should be encouraged to provide reports of airborne equipment malfunctions during actual approaches. The reports may be provided on a yearly basis or at any time the malfunctions significantly affect the Auto land capability.

PROCEDURES

A. Coordination**.** This task requires close coordination with the Operations Aviation Safety Inspector (ASI), the applicant, and an authorized engineering source.

B. REFERENCES

- ICAO DOC. 9365, Chapters 4 and 5.
- U.S. FAA Advisory Circulars 91-16, Category II Operations-General Aviation airplanes, as amended
- U.S. FAA Advisory Circular 120-28C, Criteria for Approval of Category II Landing Weather Minima, as amended
- U.S. FAA Advisory Circular 120-29, Criteria for approving Category I and Category II Landing Minima for FAR 121 Operators, as amended.

C. Review the Maintenance/Inspection Programme. Review the applicant's maintenance/inspection programme to ensure that it contains control and accountability of the following:

(1) All maintenance accomplished on lower minimum required systems and equipment.

(2) All alterations to systems and equipment.

(3) Approach status of each aircraft at all times

(4) Evaluations of self-test, Built-in Test Equipment (BITE) or Automated Test Equipment (ATE) to ensure suitability.

(5) Spare equipment

(6) Maintenance calibration, use of test equipment, record/reporting requirements

(7) Repetitive and chronic discrepancies to ensure the affected aircraft remains out of lower minimum approach status until positive corrective actions are made.

(8) All aircraft in the fleet that have not been evaluated for lower minimum approaches.

D. Review the Existing Maintenance/Inspection Programmes. Ensure that the existing maintenance/inspection programme has procedures for the following:

(1) Identifying chronic discrepancies and corrective action follow-up.

(2) Keeping aircraft with chronic and/or repetitive discrepancies out of a lower minimum status until positive corrective action is taken.

(3) Training maintenance personnel assigned to reliability analysis

(4) Initial evaluation checks for existing aircraft and for new aircraft to the fleet before inclusion in the operator's lower minimum operations.

(5) Identification of all components used in the lower minimum systems in the existing parts pool, parts borrowing procedure, and control of spare parts.

(6) Ensuring that calibration standards for all test equipment used for maintaining lower minimum systems and equipment are met.

(7) Ensuring that each flight crew and persons with operational dispatch authority are aware of any equipment malfunction that may restrict lower minimum operations.

E. Review the Functional Flight Checks. If a functional flight check has been submitted, ensure that the following information is included:

(1) Maintenance clearance and/or concurrence before an aircraft is returned to a lower minimum status, even if the functional flight check was found to be satisfactory.

(2) Request for a flight check by maintenance in the aircraft log

(3) Maintenance entry acknowledging the results and the action taken.

F. Evaluate the Supporting Data. Unless the applicant provides supporting approval data, the Avionics ASI should coordinate with the Operations ASI and the aircraft Type Certificate Holding Region/Country to determine the acceptability of each aircraft for the authorizations requested.

G. Review the Minimum Equipment List (MEL). Appropriate sections of the MEL must be revised to identify Category II required systems and special procedures, if applicable.

H. Review the Personnel Training Requirements. Ensure there are procedures for the following:

(1) Ensuring personnel contracted to perform Category II related maintenance are qualified and the programme requirements are made available to these persons.

(2) Training and/or recurrent training for the air taxi maintenance personnel. Personnel not qualified to perform maintenance on Category II systems and systems and equipment, including flight crew and dispatch, should be trained in the airworthiness release requirements of the lower minimum programme.

16.0 TASK OUTCOMES

The Principal Operations Inspector has the primary responsibility to grant the operator approval for lower minimums. It is the Airworthiness Inspector's responsibility to evaluate and approve the avionics requirements and associated support programmes. Successful completion of this task will therefore consist of coordination with the Operations ASI for providing original Category II and III documentation to the Director, Airworthiness Standards and Director, Operations, Licensing and Training Standards.

17.0 FUTURE ACTIVITIES

None.