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ADVISORY

PERSONNEL CERTIFICATION FOR NON-DESTRUCTIVE TESTING OF AIRCRAFT, ENGINES, COMPONENTS AND MATERIALS

1. AUTHORITY

This circular is issued by the Executive Chairman of the Instituto de Aviação Civil de Moçambique (IACM) in pursuance of powers vested in him under Article 31 of Law Nº 21/2009 of 21 September and Article 12 of Resolution 19/2011 of 30 November.

2. PURPOSE

This Technical circular gives guidance on the IACM requirements for the qualification of personnel on Non Destructive Testing (NDT) and Welding.

3. BACKGROUND

3.1 MOZ-CAR Part 145 of the Civil Aviation (Approved Maintenance Organisation) requires that each Approved Maintenance Organisation (AMO) shall provide specialised training, including initial and recurrent, for employees whose duties require a specialized skills.

3.2 The term NDT is used throughout this circular to include, but is not limited to, liquid penetrant, magnetic particle, eddy current, ultrasonic, radiographic and other recognized methods as identified in the following referenced standards and shall be applicable to all NDT methods used by Approved Maintenance Organizations.

4. GENERAL

4.1 **Authorization** (of NDT procedures): The act of signifying approval of NDT procedures by a nominated Level 3.

4.2 **Authorization** (of NDT personnel): A written statement issued by a Nominated Level 3 based on the individual's competence as specified within the certificate.

4.3 **Certificate:** A Document issued under the rules of the certification systems accepted by this circular, indicating that adequate confidence is provided that the named person is competent to perform specified non-destructive testing.

4.4 **Industry Sector:** A particular section of industry or technology where specialized NDT practices are used requiring specific product related knowledge, skill, equipment or training. An industrial sector may be interpreted to mean a product (welds, castings etc.) or an industry (aerospace, petrochemical etc)

4.5 **NDT Technique:** A specific way of utilizing an NDT method. (e.g. ultrasonic immersion technique).

4.6 **NDT Procedure:** A written description of all essential parameters and precautions to be observed when applying an NDT technique to a specific test, following an established standard, code or specification.

4.7 **NDT Instruction:** A written description of the precise steps to be followed in testing to an established standard, code, specification or NDT procedure.

4.8 **NDT Method:** Discipline applying a principle in Non- Destructive Testing. (e.g. ultrasonic method).

4.9 **Nominated Level 3:** An independently certified Level 3 certificate holder, responsible to the Accountable Manager for the airworthiness aspects of NDT work undertaken by that Organization.

4.10 **Qualification:** The proven ability of NDT personnel to meet the requirements of a given specification in terms of physical requirements, training, knowledge and experience necessary to perform the applicable NDT method.

4.11 **Qualification Examination:** An examination administered by an independent certifying body accepted by this circular (see paragraph) which demonstrates the general, specific and practical knowledge of the candidate.

4.12 **Type Certificate:** For the purposes of this circular, Type Certificate includes Type Certificates, Supplementary Type Certificates, Parts Approval Authorizations or Technical Standard Orders Authorizations.

5. PROCEDURES FOR THE QUALIFICATION OF NDT PERSONNEL.

5.1 All Approved Maintenance Organizations involved in any aspects of NDT shall develop and maintain procedures for the qualification and authorization of their NDT personnel. The Authority recognizes and accepts NDT qualifications from the following bodies.

5.2 In Mozambique there is no national certification requirement for aviation NDT personnel to determine that individuals are qualified to perform NDT. However, there are several current international standards acceptable to the IACM that may be used to determine that only qualified personnel perform NDT.

5.3 The Authority recognizes and accepts NDT qualifications from the following bodies.

(1) Recommended Practice SNT-TC-1A: Personnel Qualification and Certification in Non-destructive Testing (2006). This document provides guidelines for employers to establish in-house certification programs for the qualification and certification of NDT personnel.

(2) MIL-STD-410E, Military Standard, Non-destructive Testing Personnel Qualification and Certification (acceptable, although now rescinded).

(3) AIA-NAS-410, Aerospace Industries Association, National Aerospace Standard, NAS Certification & Qualification of Non-destructive Test Personnel. This document has superseded MIL-STD-410E

(4) ATA Specification 105, Air Transport Association, Guidelines for Training and Qualifying Personnel in Non-destructive Testing Methods.

(5) Canadian National Regulations contained in CAN/CGSB-48.9712-95, Qualification and Certification of Non-destructive Testing Personnel.

(6) International Standards Organization (ISO) document: ISO 9712, Non-destructive Testing – Qualification and Certification of Personnel.

(7) EN473 – General Principle for Qualification and Certification of NDT Personnel.

(8) EN4179 – Qualification and approval of personnel for non-destructive testing.

(9) American Society for Non-destructive Testing, Inc. (ASNT), Recommended Practice SNT-TC-1A, Personnel Qualification and Certification in Nondestructive Testing.

5.4 The holder of an appropriately type rated MOZ-CAR Part 66 Aircraft Maintenance licence may issue a Certificate of Release to Service to cover Non-Destructive Testing Inspections on aircraft or components, within the privileges of the licence, only for inspections requiring the use of a field kit for the Colour Contrast Dye Penetrant technique.

Note: Type II penetrant examinations shall not be used for final acceptance examination of aerospace products. In addition, Type II penetrant examinations shall not be used prior to a Type I penetrant examination of the same surface.

6. QUALIFIED STAFF

6.1 Approved Maintenance Organizations undertaking NDT must satisfy the Authority that they have adequate numbers of suitably qualified staff to discharge the responsibilities of the approval.

6.2 AMOs shall nominate in writing, supported with evidence of certification, an individual responsible to the Accountable Manager for the technical supervision of NDT. This individual will hold independent certification at Level 3 in accordance with paragraph 4.C in the appropriate industry sector and will be referred to as the "Nominated Level 3". This position shall be identified within the Maintenance Procedures Manual and any change in this position advised to the Authority.

6.3 Where the Nominated level 3 is not qualified in all methods used by the Organization, then additional Level 3 personnel necessary to provide coverage, shall be independently certified.

6.4 Additional Level 3 Certification holders shall be listed in the MPM or reference made in the MPM to other documents containing the list of Level 3 holders. Any changes to this list are to be notified to the Authority through appropriate amendments.

6.5 The Authority may accept persons external to the AMO as the Nominated Level 3, provided written agreement exists between the individual and the AMO setting out the individuals responsibilities within the AMO.

7. INSPECTIONS AND CERTIFICATION OF INSPECTIONS.

7.1 NDT inspections shall be carried out by personnel approved in accordance with the AMO's written practice. Where NDT procedures are specified by the organization responsible for the design and/or manufacture of the aircraft, material, structure or component, then these must be used, except where change is permitted and authorized as defined in paragraph 6 of this circular. Where non mandatory inspections are to be undertaken, for which the responsible design/manufacturing organization has not specified NDT procedures, then the NDT method, technique, procedure and instruction shall be prepared in accordance with paragraph 7 of this circular and approved by a Level 3 holder qualified in the applicable method.

7.2 Normally certification of inspections will be made by persons who hold Level 2 or above authorizations. However, where an inspection task is determined by the Nominated Level 3 to have clearly defined acceptability and rejection criteria requiring no interpretation, then certification may be made by an authorized Level 1, as detailed within the written procedure.

7.3 Where a Level 3 is required to carry out and certify an NDT inspection then this person must either hold current Level 2 certification in those methods, or be able to provide evidence that they have successfully completed an appropriate Level 2 practical examination and maintained continuity in the application of practical testing, as defined in the reference standards and detailed in the written procedures.

8. NDT Techniques and Instructions and their Approval.

8.1 NDT techniques, procedures and instructions, published and specified by the Type Certificate holder in NDT manuals, Service Bulletins, Approved Drawings etc. constitute airworthiness data.

8.2 Where the airworthiness data published by the Type Certificate holder permits changes (e.g. selection of equipment model, probe type etc.) then such changes must be authorized in writing by a Level 3 qualified in the appropriate method.

8.3 Any other change requires the written agreement of the Type Certificate holder responsible for the design of the product / structure and the acceptance of the IACM before such a change is implemented.

8.4 NDT instructions prepared by a Level 2 holder shall be approved by a Level 3 holder qualified in the applicable method.

8.5 The procedure for the control of all NDT techniques, procedures and instructions, including their preparation and authorization within any AMO, shall be detailed in the Approved Maintenance Organization's approved Quality Procedures within the MPM.

9. Suppliers and Sub-Contractors to Approved Maintenance Organizations.

An AMO utilising suppliers and sub-contractors where NDT processes and welding are involved, shall detail within their written procedures how the AMO ensures that training and approval of such personnel or sub-contractors is controlled. Similarly an AMO that utilizes a sub-contractor to carry out NDT processes and welding on its behalf will detail within its MPM how the requirements of this circular are addressed.

10. Aircraft Welding

10.1 Types of Manual Welding shall include the following;

a) Gas Welding,
b) Braze Welding,
c) Metal Arc Welding,
d) Gas Tungsten Arc Welding,
e) Gas Metal Arc Welding,
f) Plasma Arc Welding

10.2 Parent Metal Groups

(1) Parent Metal Groups for which qualification may be sought include the following;

a) Aluminium Alloys,
b) Magnesium Alloys,
c) Carbon Steel and Low Alloy Steels,

d) Corrosion and Heat Resistant Steels,
e) Nickel Alloys,
f) Copper based Alloys,
g) Titanium Alloys.

10.3 Qualifications

(1) Personnel intending to engage in aircraft welding shall receive professional training in both theoretical and practical training in the particular type of manual welding and parent metal group qualification sought. The training is expected to cover the following subjects;

a) Safety in Welding,
b) Welding Equipment,
c) Theory and Application of Welding Processes,
d) Welded Joints,
e) Welding Metallurgy,
f) Welding Practices and Production

(2) Individuals intending to undertake training in any type of the welding processes shall undergo professional training at a facility acceptable to IACM, and such training shall be in accordance with an approved training programme. Records of such training and associated examinations shall be maintained and produced to the Authority's inspectors on demand.

10.4 Visual Acuity

(1) Personnel engaged in NDT and Welding shall have periodic visual acuity tests performed by appropriately qualified medical practitioners. This is to ensure their vision and colour perception meets the required criteria for the precision and accuracy demanded by the trades. The respective Organizations (employers) shall maintain such medical records in confidence and will be subject to inspection by IACM inspectors.

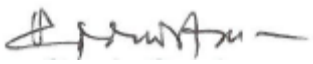
10.5 Other Specialized Maintenance Activities;

Approved Maintenance Organizations engaged in '**Metal Plating** and **Borescope Inspections'** shall also be required to develop training and qualification procedures for personnel performing such functions. All training shall be as guided by equipment manufacturers and where applicable shall be tailored to include specific requirements of aircraft manufacturers.

10.6 Training and Qualification

The Authority shall recognize and accept training standards and qualifications approved or recognized by the European Aviation Safety Agency (EASA) and the Federal Aviation Administration (FAA).

EXECUTIVE CHAIRMAN



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