



ESWATINI CIVIL AVIATION AUTHORITY

# Advisory Circular

CAA-AC-AWS021A

April 2021

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## QUALIFICATION GUIDELINES FOR SPECIALIZED MAINTENANCE ACTIVITIES; NON DESTRUCTIVE TESTING & WELDING

### 1.0 PURPOSE

This Order is issued to provide guidance to the aviation stakeholders for the assessment of applications of personnel who are engaged in Specialized Maintenance Activities i.e. Non Destructive Testing methods and Aircraft Welding. Specific qualification requirements shall however be determined by respective test equipment and welding equipment manufacturers unless where other overriding instructions are given in this regard.

### 2.0 REFERENCES

Part II Certification - Article 12 Limited rating to AMO of the Civil Aviation Legal Notice 110 (Approved Maintenance Organization) and Part 3 of the First Schedule (Regulation 26 (11)) to the Civil Aviation Article 3.11.

### 3.0 GUIDANCE

#### 3.1 General Information

Part 3 of the First Schedule to AMO regulations requires the Organization's Quality System Procedures to include Qualification procedure for specialized activities such as Non-Destructive Testing, Welding, etc. The procedures shall include minimum requirements for professional qualification and for certifying personnel involved in such maintenance activities. Minimum Requirements shall include;

- a) Initial training,
- b) Skills & experience,
- c) Examinations,
- d) Medical examinations as applicable,

e) Recurrent training

Under the provisions of Personnel Licensing Legal Notice 111 Part IX, the Authority may issue applicable classes of '**Aviation Repair Specialist Authorizations**' to personnel qualified to perform specific methods of NDT and welding.

### 3.2 Levels of Qualification

**3.2.1** According to basic international practices, the following levels of qualification are used in the training and capacity building of NDT personnel;

- a) Trainee,
- b) Level 1
- c) Level 2
- d) Level 3
- e) Instructor (optional)

**3.2.2** Trainee – is an individual who is at the early stages of skills acquisition in the trade. The individual shall be taken through a Training Programme developed by the Organization and approved by the Authority. In addition to theoretical class-room work, the individual shall obtain work experience under the guidance of Level 2 or 3 personnel in the same method studied in the theoretical part. Any guidance from level 1 personnel should be very limited and should be supervised by level 2 or 3 personnel.

**3.2.3 Level 1** – shall have the skills and knowledge to prepare process and perform limited tasks in accordance with written and approved instructions under the supervision of level 2 or 3 personnel. This level shall not have certification authority and should be taken through phases of the approved Training Programme.

**3.2.4 Level 2** – shall have the skills and knowledge to set up test equipment, conduct tests, interpret and evaluate results for acceptance or rejection of parts undergoing test. The individual shall be capable of providing necessary guidance and supervision to Level 1 and Trainee personnel. This level may perform tasks without direct supervision of Level 3 personnel. Unless other considerations are made and approved by the Authority in writing, Level 2 personnel may be granted limited certification authority on dye penetrant testing only.

**3.2.5 Level 3** – shall be qualified to perform applicable processes to a high degree of accuracy. Level 3 personnel shall have certifying authority limited to methods qualified on. The individual should be capable of;

- a) Guiding and supervising all levels below level 3,
- b) Providing direct training,
- c) Practical examination'
- d) Assisting in assessment of personnel for qualification purposes
- e) Be capable of assisting in an audit of subcontracted organizations in the NDT methods of Qualification.

**3.2.6 Instructor** – shall have the skills and knowledge to perform the following;

- a) Plan and organize training,
- b) Present classroom training,
- c) Conduct practical exercises,
- d) Perform On Job Training,
- e) Conduct theoretical and practical examinations,
- f) Participate in the qualifying process for certifying personnel
- g) Develop work instructions,
- h) Be capable of conducting an audit of subcontracted organizations in the NDT methods qualified on.

**3.2.7** Other methods of NDT that can be used include but not limited to;

- a) Acoustic Emission,
- b) Neutron Radiography,
- c) Penetrant Leak Testing,
- d) Thermography,
- e) Holography and
- f) Computer Tomography.

## **4. Aircraft Welding**

### **4.1 Types of Manual Welding**

These shall include but not limited to the following;

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

#### **4.1.1 Parent Metal Groups**

Parent Metal Groups for which qualification may be sought include but are not limited to the following;

- a) Aluminium Alloys,
- b) Magnesium Alloys,
- c) Carbon Steel and Low Alloy Steels,
- d) Corrosion and Heat Resisting Steels,
- e) Nickel Alloys,
- f) Copper based Alloys,
- g) Titanium Alloys.

#### **4.1.2 Qualifications**

Personnel intending to be, or engaged 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 but not limited to 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 Practice and Production

Individuals intending to, or undertaking training in any type of the welding processes shall be provided with professional training at a facility acceptable to ESWACAA. Training provided shall be in accordance with ESWACAA approved Training Programme. Records of such training and associated examinations undertaken shall be maintained and produced to the Authority's inspectors on demand.

#### **4.1.3 Visual Acuity**

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 ESWACAA inspectors.

### **5.0 Other Specialized Maintenance Activities**

**5.1.1** 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.

#### **5.1.2 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). The Authority shall recognize and accept any other training and qualification the Director General of Eswatini Civil Aviation Authority may approve.

## **6.0 IMPLEMENTATION**

### **6.1. Initial implementation of a trade standard**

**6.1.2** AMO's can utilize the trade standards found in Appendix A as one means of satisfying the technical training requirements as it pertains to training, qualifying and authorizing of personnel other than Aircraft Maintenance Engineers License (AMEL's).

**6.1.3** To accomplish this, the AMO shall incorporate the respective trade standards in its entirety as part of the training program in the organization's Maintenance Policy Manual (MPM).

**6.1.4** Once part of the training program, the organization will be able to utilize and implement this training for employees as applicable.

**6.1.5** Trained employees will be able to perform duties as it pertains to the respective trade standards within the organization.

## **6.2. Individuals who currently hold accreditation of a trade standard**

**6.2.1** Organizations can employ individuals who hold accreditation in any of the trade standards found in Appendix A and authorize these persons without further technical training.

**6.2.2** If an organization employs an already accredited individual, it is expected that the organization will have already amended the training program of their MPM to comply with the ESWACAA AC- AWS021 requirements before said individual commences duties pertaining to their trade.

### **Note: AMEL and Maintenance Release requirements**

Technical training, qualifying and authorizing of personnel in accordance with the respective trade standard within an AMO is linked exclusively to work performance and does not extend to the maintenance release of aeronautical products. This privilege will continue to be exercised by an appropriately rated and authorized AMEL or in the case of off aircraft work a person that has been authorized to sign in accordance with the MPM of an AMO.

Recognition of the trade standards identified in this Order does not relate to the requirements for issue of an AMEL. Individuals seeking to obtain an AME License must meet the requirements of Legal Notice 111, Personnel Licensing, part IX.

**Approved by Director General  
Civil Aviation Authority**

## APPENDIX A — ESWACAA ACCEPTED TRADE STANDARDS FOR PERSONNEL WORKING IN APPROVED MAINTENANCE ORGANIZATIONS

The following standards may be referenced and used as one means of demonstrating compliance with the technical training requirements for personnel to perform work within an AMO.

***Note:** Revision numbers and dates are correct at the time of publication of this Order, but should be verified before use.*

*(The structure of the table below is as follows: 1) the organization that has control of the standard can be found in the first line, 2) the third line represents the recognized national and international trade standard and 3) the fourth line gives a brief breakdown of what the standard entails.)*

<b>Aerospace Industries Association (AIA)</b>
<b>NAS 410 Revision 3</b>
NDT:
Levels 1, 2 and 3
a) Eddy current
b) Liquid penetrant
c) Magnetic particle
d) Radiography
e) Ultrasonic methods
<b>Airlines for America (A4A)</b>
<b>ATA Specification 105 Revision 2011.1</b>
NDT:
Levels 1,2 and 3
a) Eddy current
b) Liquid penetrant
c) Magnetic particle
d) Radiography
e) Ultrasonic methods
Trade Standards for Personnel Working in Approved Maintenance Organizations
2013-09-30 7 of 8 AC 573-003 Issue 01
<b>Canadian General Standards Board (CGSB)</b>
<b>CAN/CGSB 48.9712-2006/ISO 9712:2005</b>
Levels 1, 2 and 3
NDT:
a) Liquid penetrant,
b) Magnetic particle
c) Ultrasonic methods

d) Eddy current
e) Radiography

<b>American Welding Society (AWS)</b>
<b>ANSI/AWS D17.1/D17.1M:2010-AMD1</b>
Fusion Welding only

<b>Any NDT and Welding</b> standards from Europe EFNDT (EASA Authority)
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