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DOCUMENT

ESA-Approved Skills Certification Requirements

Electronic Assembly Domain

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APPROVAL

ESA STR 258: ESA-Approved Skills Certification Requirements - Electronic Assembly Domain

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CHANGE LOG

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CHANGE RECORD

Issue 3	Revision Number:0		
Reason for change	Date	Pages	Paragraph(s)
- Updated responsibilities for the ESA Skills Certification Scheme, including the definition of the roles and responsibilities of TEC-M, TEC-Q, ESA Technical Manager, Assessor and Certification Centre Manager. - Updated scope and terminology to distinguish ESA certification activities from in-house re-certification activities. - Replaced ECSS-Q-ST-70-07, ECSS-Q-ST-70-08 and ECSS-Q-ST-70-38 by ECSS-Q-ST-70-61 - Updated the ESA Certification Structure (progression routes for certification) to align with the ECSS-Q-ST-70-61-based certification philosophy, introducing separate certification paths for Wiring, Through-Hole Technology (THT), Surface-Mount Technology (SMT), RF Cable Assembly, Repair and Modification. - Revised certification requirements and progression rules:			

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○ Clarified employer responsibility for training and assessment of practical skills before ESA certification. ○ Added requirement that operators of solder paste deposition, pick-and-place and automatic soldering equipment are trained and certified by their employer and do not require ESA certification. • Updated certificate management requirements: ○ Added requirement to issue Cat 2 and Cat 3 certificates within two weeks of course completion. ○ Added requirement to submit Cat 1 certificates to ESA Technical Manager within two weeks for validation and signature. • Revised recertification provisions: ○ Clarified certificate extension rules. ○ Explicitly prohibited six-month extension of certificates issued by in-house Cat 1 instructors. ○ Clarified recertification requirements for Category 1 personnel. • Expanded withdrawal of certification requirements: ○ Added work interruption exceeding nine months as a cause for loss of certification status. ○ Introduced mandatory NCR reporting and notification requirements to certification centres and ESA. ○ Added responsibilities regarding withdrawal of Cat 1 certifications. • Updated certification centre approval requirements by adding: ○ certification scope, ○ Cat 1 personnel list, ○ authorised signatures, ○ approval validity period, ○ certification centre manager details, ○ ESA interface designation. • Updated annual skills certification centre meeting requirements to explicitly require face-to-face attendance. • Completely revised Annex 1 audit checklist, including: ○ detailed facility and equipment requirements, tooling, consumables and process control assessments, management of certificates, complaints and records, separate evaluation of ESA-approved centres and in-house re-certification activities.			
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- Replaced the former ECSS-Q-ST-70-08 and ECSS-Q-ST-70-38 training structure with a new ECSS-Q-ST-70-61-based training scheme: - Annex 3: ECSS-Q-ST-70-61 Wiring/THT Operator. - Annex 4: ECSS-Q-ST-70-61 SMT Operator. - Annex 5: ECSS-Q-ST-70-61 Inspector. - Added new certification programmes: - RF Cable Assembly Inspector (Annex 7). - ECSS-Q-ST-70-28 Repair and Modification Operator (Annex 9). - ECSS-Q-ST-70-28 Repair and Modification Inspector (Annex 10). - Revised course outlines for: - ECSS-Q-ST-70-18 RF Cable Assembly, - ECSS-Q-ST-70-26 Crimping, - ECSS-Q-ST-70-30 Wire Wrapping, - Category 1 Instructor certification. - Added detailed minimum practical exercises, examination criteria, minimum course durations and recertification requirements across all certification courses. - Updated Category 1 Instructor certification prerequisites, examination content and certification requirements to align with the ECSS-Q-ST-70-61 certification framework. - Updated the list of ESA-approved certification centres: - Added RENEX Electronics Education Centre (Poland).			
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Abstract

This document describes the various activities that skills certification centres undergo to gain and maintain an ESA approval for the certification of electronic assembly operators, inspectors and instructors. The certification courses are in accordance with the ECSS-Q Standards for electronic assembly and processes used for European space projects. Outlines of the course contents are given and the tools needed for these manufacturing processes are described. The courses also provide a basic understanding of the use of materials in the space environment.

This document also harmonises the approach and technical content of the various certification courses offered by ESA-approved skills certification centres, the types of certifications awarded to successful candidates, and the means of progressing or retaining their certified status. In-house organisation for the re-certification of operators and inspectors within suppliers' premises is also described.

1. Introduction

As part of its activities to promote, improve and maintain the quality of work within the space industry, the Mechanical Department with the support of the Product Assurance and Safety Department operates a scheme for the approval of centres to certify and re-certify operators, inspectors and instructors in electronic assembly in accordance with ECSS standards. Manufacturing and assembly methods applied within the space industry for spacecraft electronics are detailed in the various process specifications cited herein.

In developing skills certification centres, ESA's goals are to:

Develop a pool of personnel trained by their employers in best practices for electronic assembly.

Develop a network of organisations capable of providing certification to appropriate standards.

Improve the quality of electronic assemblies used in space projects.

These goals are achieved by:

1. Provision of high-quality certification in electronic assembly techniques at ESA approved certification centres.
2. Assurance that operators, inspectors and instructors obtain a level of technical knowledge and experience through training by their employers to enable certification.
3. Harmonisation of the general policies between centres, notably courses and examinations, by means of the ESA annual certification centres meeting.
4. Continued monitoring, assessment and audit of approved centres by an ESA Technical Manager.

The ESA certification progression schematic does not substitute the internal training and qualification that shall be operated by the Companies (employers) according to company procedures but is considered as a mandatory complement to certify the skills of the personnel to the relevant ECSS standard. As indicated in Figure 5.1 all attendees shall have adequate experience to be entitled to participate in an ESA skills certification course.

2. Scope

This document describes the various activities necessary to become and maintain an ESA-approved skills certification centre for the certification of electronic assembly operators, inspectors and instructors in accordance with the applied standards and process specifications cited herein.

The document also describes the activities necessary to become and maintain an in-house organisation for the re-certification of operators and inspectors.

The document identifies means of retaining certification status of personnel and of potentially progressing through certification categories.

3. Abbreviations

CAT	Category
ECSS	European Cooperation for Space Standardization
ESA	European Space Agency
ESTEC	European Space Research and Technology Centre
MELF	Metal Electrode Leadless Face
MIP	Mandatory Inspection Point
NCR	Non-Conformance Report
PCB	Printed Circuit Board
SMC	Surface Mount Components
VA	Visual Acuity

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4. Related Documents

Skills Certification Centres establish and maintain an effective written programme to certify and recertify all personnel performing any operations described in one or more of the standards and process specifications listed in Table 4.1. ECSS standards are available for download at the ECSS website (<http://www.ecss.nl/>).

Always establish that the version of a standard or process specification is the most recent issue.

ECSS-Q-ST-70-18	The preparation, assembly and mounting of RF coaxial cables
ECSS-Q-ST-70-26	The crimping of high-reliability electrical connections
ECSS-Q-ST-70-28	The repair and modification of printed-circuit boards and solder joints for space use
ECSS-Q-ST-70-30	The wire wrapping of high-reliability electrical connections
ECSS-Q-ST-70-61	High-reliability assembly for surface-mount and through hole connections

Table 4.1 – Electronic assembly standards

5. Skills Certification Scheme

5.1 Approval

TEC-Q with the support of TEC-M has the Approval authority of the ESA skills certification centres. Therefore TEC-M and TEC-Q have the authority to grant the Cat 1 certificates issued by the ESA skills certification centres.

TEC-M and TEC-Q co-sign the Cat 1 certificates.

An ESA Technical Manager is nominated by TEC-M and TEC-Q. The ESA Technical Manager is responsible for the following:

- Ensure that the Skills Certification centres are in compliance with the ESA STR-258.
- Validation of Category 1 certificates.
- Coordinate and conduct audits of certification centres.
- Run the Annual Management meetings.
- Evaluate new certification centre applications for certification.
- Investigate and address complaints of certification centres.

The ESA-nominated Technical Manager has the final authority for granting, extending, reducing or removing the approval status of a skills certification centre or an in-house training/re-certification Instructor.

The ESA Technical Manager can nominate assessor(s) to conduct the audit of the Skills Certification centres. The Assessor must have the technical experience required to perform the audit and acts as focal point of the electronic hardware supplier in compliance with the ECSS-Q-ST-70-61. An Assessor is responsible for the following:

- Coordinate and conduct audits of certification centres.
- Follow-up with certification centres following an audit to ensure any actions raised as part of the audit are closed in a timely manner.
- Recommending extension of certificate validity, or changes in status of certification centres to the ESA Technical Manager.
- Act as focal point of the electronic hardware supplier in compliance with the ECSS-Q-ST-70-61.

The Certification Centre Manager has the following responsibilities:

- Approval of granted certificates by the certification centre he belongs to.
- Attendance to the Annual Skills Certification Centre Meeting.
- Supporting audits of the certification centre by the ESA Assessor or ESA Technical Manager.
- Act as a contact point for the certification centre with ESA Assessor and/or ESA Technical Manager

5.2 Skills Certification

5.2.1 ESA Approved Skills Certification Centres

To be granted or maintain the ESA-approved status, each certification centre shall fulfil the following:

1. Pass the initial assessment or audit (see Annex 1).
2. Make available staff credentials and centre records for internal audit.
3. Submit customer feedback results.

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4. Make available student records (see section 5.5).
5. Submit the list of waivers issued.
6. Describe corrective action to resolve any non-conformances.
7. Maintain resources, facilities, records and provision of certification.

5.2.2 In-house re-certification Instructor

To be granted or maintain an in-house re-certification Instructor, a company shall fulfil the following:

1. Pass the audit (see Annex 1).
2. Make available staff credentials and centre records for internal audit.
3. Submit an outline for each skills training course that may lead to ESA certification by an ESA-approved Certification Centre.
4. Submit an outline for each re-certification course that meets ESA's requirements (see Annexes 3 to 9).
5. Describe corrective action to resolve any non-conformances.
6. Maintain resources, facilities, records and provision of training.

5.3 Certification: Categories and Personnel

5.3.1 Categories

Three types of certifications are awarded by the skills certification centres, as given in Table 5.1.

Category	Title	Conditions of award
Category 1	Instructor	Certificate shall only be issued by an ESA-approved skills certification centre and co-signed by ESA.
Category 2	Inspector	First certificate shall only be issued by an ESA-approved certification centre. Re-certification can be undertaken by either an ESA-approved certification centre or by an in-house training/certification instructor who is ESA certified Instructor (Category 1 certified see above).
Category 3	Operator	First certificate shall only be issued by an ESA-approved certification centre. Re-certification can be undertaken by either an ESA-approved certification centre or by an in-house training/certification instructor who is ESA certified Instructor (Category 1 certified see above)
See 5.9 for list of ESA-approved skills certification centres		

Table 5.1 – Certification: categories and conditions of award

5.3.2 Certificates

Each certification centre or in-house training/certified Cat 1 instructor issues certificates (See Annex 2 for an example of a certificate) in two formats which are standardised across certification centres or in-house training/certified Cat 1 instructor:

1. full A4 page size for display purposes.
2. 'credit card' size, carried by certified Cat 3 and Cat 2 personnel to enable identification at the place of work.
3. In-house certificates must not carry ESA logo.

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4. Certificates shall have a serial number.
5. ESA suppliers shall keep certificates of their personnel in an auditable manner.
6. When operators are certified to perform limited operations or processes, it is stated on the certificate, along with all associated certification records.
7. Each certificate is approved by the signature of the Certification Centre Manager or Category 1 Instructor (whether in the centre or in-house training certified Cat 1 instructor). Category 1 Certificates issued by ESA certification centres shall be countersigned by ESA Mechanical Department and Product Assurance and Safety Department.
8. The Cat 2 and Cat 3 Certificates shall be sent to the employers by the Certification Centres by a maximum of 2 weeks from end of the certification session.
9. The Cat 1 certificates shall be sent by the Certification Centres to ESA Technical Manager for signature by a maximum of 2 weeks after the end of the certification session.
10. Certificates are valid for a period of two years (see also 5.7). The issue and expiry dates are shown on the certificate. A new certificate shall be issued after successful re-certification.

5.3.3 Certified Personnel

The initial certification of every operator and inspector shall be undertaken at one of the approved centres (see 5.9). Re-certification can be performed either at an ESA-approved certification centre or by an in-house ESA-certified Category 1 instructor.

In-house Category 1 personnel are responsible for the training and re-certification of Category 2 and Category 3 personnel but shall not certify them for the first time. Training records shall be maintained by Category 1 instructors as required in 5.5.

In-house Category 1 personnel of a supplier shall train and re-certify only their own employees and contractors, and not those of any outsourcing organisation.

In-house Category 1 personnel of a supplier manufacturing for ESA programmes may train and re-certify employees from outsourcing organisation providing they obtain approval from ESA.

Category 1 personnel of all ESA-approved skills certification centres can certify and re-certify Category 2 and Category 3 personnel.

Category 1 personnel of selected ESA-approved skills certification centres can certify and re-certify Category 1 personnel.

The Applicant for Category 2 and/or Category 3 personnel to perform inspections and processing operations respectively, at the site of the company they are employed by and from shall have had an internal training and proved to have the necessary skills in the relevant process prior to attend to ESA skills certification at an ESA skills certification centre.

Personnel certified by an ESA-approved skills certification centre may maintain their certification status even if/when they change employer pending authorization from ESA.

In-house re-certified personnel do not maintain their certification status if / when they change employer.

Suppliers which provide in-house training/certification for the re-certification of inspectors and operators, shall have at least one Category 1 instructor for each of the processes used by the supplier (see 4 – Related Documents).

5.3.4 Progression of Certified Personnel

Figure 5.1 shows the progression route for certification of personnel. All personnel undergo operator certification (Cat 3) prior to potentially advancing to inspector level (Cat 2) and instructor (Cat 1) level. The certification progression structure shows the possible developments, over a sustained period of time, of the skills, standards and categories.

The progression routes exist to allow ESA suppliers to grow and upskill their workforce as required.

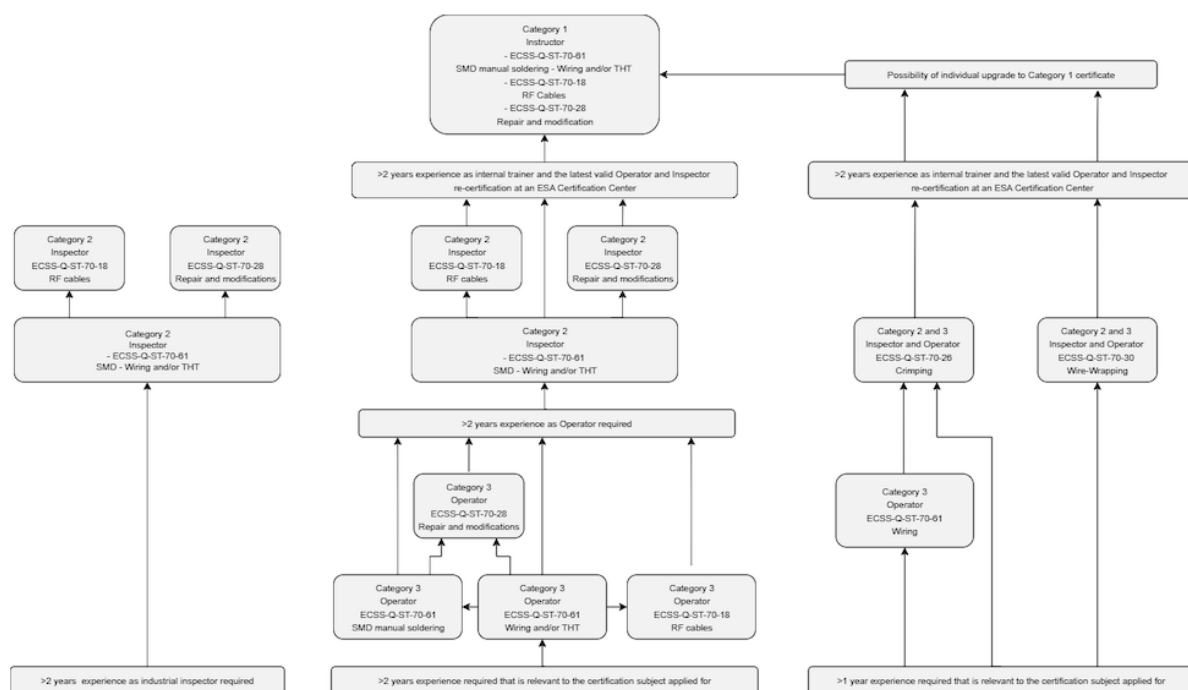


Figure 5.1 – ESA certification Structure –progression routes for certification

A person shall have a minimum of two years full time equivalent experience and be trained and proved to have the necessary skills by their employer in the relevant processes and job role before being admitted on an ESA-approved certification course with the exception for the ECSS-Q-ST-70-30 and ‘-26 certification for which one year is deemed sufficient. When such requirement may be detrimental to business continuity, a waiver system is in place. Please see Annex 13 for an example of a request for a waiver (RFW).

In all cases, whether any requirements have been waived or not, a person attending an ESA approved skills certification course will only receive an ESA certification if they pass both the theoretical and practical examinations relevant to the standards that the courses are based on.

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A person applying for Category 1 certification shall have been working as an in-house trainer for at least two years and that status registered by ESA and have their latest Cat 2/3 certificates issued by an ESA-approved skills certification centre.

Operators of solder paste/ pick and place and Automatic soldering machine are not required to be ECSS certified but to be trained and certified by their employer for their task.

5.4 Visual Acuity

All candidates shall meet the visual acuity (VA) requirements:

1. Near vision: JAEGER 1 or 0.50 mm letters at 35.5 cm or better
2. Colour perception: Normal as determined by means of standard colour plates. i.e. Dvorine pseudo-isochromatic plates, Ishihara plates or equivalent.

Employers shall hold visual acuity forms for all their ESA certified personnel and confirm (by way of a signature of the applicant's manager) that they meet the requirements at the time of the application for a course.

5.5 Training/Certification Records

The certification centres or in-house Cat 1 instructor's (re) certification records shall be maintained for four years (two most recent training/certification cycles).

The certification records, for each course attendee, shall comprise:

1. Trainee fabricated test specimens depicting satisfactory conformance to the applicable process specification.
2. The marked written test papers.
3. Details of the employer and employer's address.
4. Certification Category, with any restrictions clearly noted.
5. Date of certification or re-certification.
6. Completed and employer-countersigned application form, including any waivers, that also shows that the visual acuity requirements are met (see 5.4).

Note: Requirements 4 and 5 may be met by keeping a copy of the certificates issued.

5.6 Certification Programme Evaluation

The certification programme, the associated certification facilities, the certification records and the trainee practical test are reviewed by ESA to assure that each programme is compatible with the relevant standard or process specification (see Annexes 3 to 12 for details of each certification course outline).

Approval of a certification programme can be withdrawn at any time in the event of a nonconformance.

5.7 Maintenance of Certified Status and Recertification

Instructors, inspectors and operators need to demonstrate continuous proficiency and a high standard of workmanship in order to maintain their status of certification. This is demonstrated by re-certification every two years.

Re-certification of operator and inspector personnel is undertaken as follows:

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1. Re-certification courses should be booked six months before the certification end date to avoid lapse in certification.
2. Re-certification shall be undertaken every two years (unless specific and unavoidable circumstances apply).
3. If less than two years since last certification, personnel may attend a re-certification course to have their certification granted for a further two years. Personnel may attend a recertification course up to six months before their certification end date and maintain their anniversary of certification.
4. If there is no mutual availability for a re-certification course, personnel shall ask ESA Centre for an extension of their certificate originally issued by an ESA Centre. The extension may be up to six months to cover the gap between the certification end date and the booked course date. The original anniversary of certification will be maintained.

Note 1: If a person's certificate ends in September of 202x, and they get an extension of up to six months, attend a re-certification course no later than March of 202x+1, their new certificate will expire in September 202x+2.

Note 2: The scanned version of the original certificate will be stamped with the following statement "This certificate is extended from end of xxxx until end of yyyy in accordance with the ESA STR-258 para. 5.7.4".

Note 3: The extension can be provided only by the ESA centre that has issued the original certificate.

5. Extension by six months of certificates issued by in-house Cat 1 is not allowed. Any operator/inspector with an expired in-house certificate are not allowed to work on ESA projects.
6. After certification end-date, there is a two-year lapse period where re-certifications can be taken. In this lapse period the person is no longer authorized to work on ESA projects. If the lapse period is more than two years, then the full certification course shall be attended. The full certification shall be undertaken at an ESA certification centre.
7. If operator or inspector personnel experience a work-period interruption of greater than nine months (responsibility of the employer).
8. Insufficient proficiency for a particular standard or process specification.
9. There is a reason to question proficiency of workmanship.
10. Development of new techniques that need new skills.

Instructors are certified and recertified as follows:

1. In-house training personnel gain their certification for Category 1 by attending a course at an ESA-approved skills certification centre approved for Category 1 certification (see Table 5.2).
2. ESA-approved skills certification centres' personnel gain their first Category 1 certification by attending a course at an ESA-approved skills certification centre.
3. Category 1 personnel shall be re-certified every two years in an ESA-approved skills certification centre.
4. If less than two years since last certification, personnel may attend a re-certification course to have their certification extended for a further two years. Personnel may attend a recertification course up to six months before their certification end date and maintain their anniversary of certification.
5. If there is no mutual availability for a re-certification course, personnel shall ask ESA Centre for an extension of their certificate. The extension may be up to six months to cover the gap

between the certification end date and the booked course date. The original anniversary of certification will be maintained.

6. ESA skills certification centres Cat 1 shall recertify in an ESA skills certification centre different than the one they are working for.

5.8 Withdrawal of Certified Status

It is the responsibility of the employers to invalidate the certifications in the following circumstances.

1. The certificate holder no longer meets the visual acuity requirements (see 5.4).
2. The quality of work does not meet the standard or process specification.
3. There is a reason to question proficiency of workmanship.
4. Repetitive manufacturing defects.
5. The operator (Cat 3) and/ or inspector (Cat 2) has a work interruption of more than 9 months.

It is the responsibility of the employer to inform the ESA Skills certification centre that provided the certification of the withdrawal of the certificate. An NCR shall be issued by the employer that details the cause of the non-compliance.

It is the responsibility of the ESA skills certification centre to list all NCRs received by their customer. The ESA skills certification centre shall inform ESA Technical Manager in case a Cat 1 certificate is withdrawn and the reason of it.

5.9 Certification Centres

Table 5.2 lists ESA-approved skills certification centres. All ESA-approved skills certification centres can certify and re-certify Category 3 and Category 2 personnel. Category 1 certification and re-certification is only awarded by centres marked γ . Re-certification of Category 2 and 3 personnel can also be accomplished through in-house training (see 5.3).

Courses in English are available at the centres marked *

The maximum number of attendees per certification course is limited to ten for ESA-approved certification centres. For in-house training/certification, the maximum of attendees per training/certification course is limited to six.

Country	ESA approved skills certification centre	Skills certification Manager contact
Denmark	Hytek * Sofievej 61 DK-9000 Aalborg	Tel. +45 9811 7003 Contact: Mr. P. Juul hytek@hytekaalborg.dk
France	Institut de Soudure (IS) Industrie Bâtiment Rousseau 22 Avenue des nations F-93420 Villepinte	Tel. +33 (1) 49903622 Contact: Mr. P. Aloe P.Aloe@isgroupe.com
Germany	Institut für Elektronik GmbH (IFE) γ * Friedrichshafener Strasse 2 D-82205 Gilching	Tel. +49 8105 7795936 Contact: Mr. L. Schöberle leo.schoeberle@ife-technology.de
	Zentrum für Verbindungstechnik in der Elektronik (ZVE) γ Fraunhofer Research Institution for Microsystems and Solid-State Technologies EMFT, Argelsrieder Feld 6, D-82234 Weßling/ Oberpfaffenhofen	Tel. +49 (0) 89 54759-456 Contact: Dr.-Ing. F. Ansorge frank.ansorge@emft.fraunhofer.de
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Switzerland	Swiss Welding Institute (SWI) Rue du Nord 3 1400 Yverdon-les-Bains	Tel. +41 24 557 73 90 Contact: Mr. R. Müller info@swi.ch
UK	ASTA Technology UK Ltd γ * Anglesea Building Room A2.13 Anglesea Road Portsmouth PO1 3DJ	Tel. +44 (0) 23 9284 2049 Contact: Mr I. de Oliveira Junior isocrates.deoliveirajunior@port.ac.uk

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γ Approved centre for Category 1 certification *Courses in English available
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Table 5.2 – ESA-approved skills certification centres for electronic assembly techniques

6. Approval of Certification Centres

6.1 Application for Approval

To apply for ESA-approval, a potential skills certification centre shall submit the following information to the ESA nominated Technical Manager:

1. Supporting letter from an ESA delegate.
2. Geographical and language coverage of the applicant centre.
3. An assessment of the potential market for the centre in terms of sustainability.
4. Business plan.
5. An assessment of whether the centre has access to the resources (human and physical) needed to meet the standards.
6. Documented procedures and instructions relating to the operation of the certification programme.
7. Supporting letter from an electronic manufacturer from the proposed geographical and / or language coverage.
8. Report detailing the experience in electronic assembly and training and certification.

An assessment of the information provided is undertaken by ESA in order to approve the application of a new centre.

6.2 Review and Monitoring

6.2.1 Periodic Review

The audit of the skills certification centres shall be conducted in compliance with the audit form (see Annex 1).

Both ESA-approved certification centres and in-house training/certification operated by an ESA instructor shall be audited at least once every four years by ESA.

6.2.2 Complaints

Complaints may fall into the following categories:

1. A complaint by a trainee about a skills certification centre. This should be sent to ESA and the certification centre.
2. A failure traced to unsatisfactory work by a certified operator or inspector. It is the responsibility of the employer and/or ESA, based on objective evidence related to mandatory inspection points (MIPs) and non-conformance reports (NCRs) to raise a complaint.

In both cases the ESA-nominated Technical Manager investigates the complaint and reports back to the skills certification centre and the complainant regarding the action to be taken to resolve the issue.

6.3 ESA Approval, Change and Withdrawal of Approval Status

6.3.1 ESA Approval

Based on a review of the centre's documentation and an ESA audit, approval is granted if the skills certification centre has passed an audit and there are no major actions outstanding.

Approval is awarded in the form of a letter signed by the ESA, giving:

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1. Details of the skills certification Centre, e.g. name of the centre and abbreviated address.
2. A list of certifications that the centre is authorized to provide.
3. The list of the Cat 1 personnel of the skills certification Centre.
4. Name of the Certification Centre Manager.
5. Name of the ESA interface.
6. List of the authorised signatures of certificates.
7. Validity period of the certification.

6.3.2 Extension

A skills certification centre shall apply to extend its certification portfolio (scope) by submitting details of a new course to the ESA for assessment.

6.3.3 Reduction

The approval scope can be reduced either by the skills certification centre (notification to ESA in writing), or as a result of complaints and audits.

The scope can be reduced if:

1. The capability of a skills certification centre has been reduced in terms of personnel or facilities.
2. Corrective actions with respect to a particular Approval have not been satisfactorily implemented.

6.3.4 Withdrawal

Approval can be withdrawn either by application from the certification centre in writing, or because of complaints and audit outcomes:

1. The skills certification centre loses its staff or closes.
2. Assigned major corrective actions with respect to the provision of the certification service have not been cleared as agreed with the ESA (e.g. Non-conformances with the ESA STR-258).
3. The certification centre representatives do not attend the annual skills certification centres meeting.

7. Annual Skills Certification Centre Meeting

A face-to-face meeting of all ESA-approved skills certification centres is organised by ESA every year. The meeting shall be attended by the certification centre manager and by all Category 1 instructors from each centre.

Additional meetings aimed at maintaining currency of certification are held whenever a major revision of any standard is introduced.

8. Maintenance of Records by ESA

8.1 Assessment Records

ESA generates and maintains a file for each skills certification centre comprising the two most recent audit reports and associated corrective action clearance records.

8.2 Certified Personnel List

Each skills certification centre generates and maintains a list of certified operators, inspectors and instructors (see 5.5).

8.3 Certified Instructors List

A list of Category 1 certified instructors is maintained by ESA.

ANNEX 1

CHECKLIST FOR THE ASSESSMENT, AUDIT AND MONITORING OF ESA-APPROVED SKILLS CERTIFICATION CENTRES FOR ELECTRONIC ASSEMBLY AND IN HOUSE RE-CERTIFICATION CENTRE)

1) INTRODUCTION

This document serves as a checklist for the assessment, audit and monitoring of ESA-Approved skills certification centres and in-house training/certification centres (Electronic Assembly Techniques).

Audits are undertaken at least once every four years.

This audit has been organized to assess the suitability of the ESA skills certification centre or in-house training/certification centre shown below. Records of evidence viewed shall be provided in the check list.

2) ADMINISTRATION

ESA 'Assessor' for the Approval is:

Certification Centre contact (present during assessment/audit):

Name of Centre:

Address of Centre:

Contact details

Telephone:

E-Mail:

Date of Audit:

3) DESCRIPTION OF CENTRE

a) Managing Director of Centre:

b) ESA-Centre Manager:

c) Quality certificates of the ESA Approved Skills centre:

d) Centre is ESA accredited for certification and/or re-certification in accordance with the following:

e) ESA-Approved Instructor(s) are employed by the Centre:

Name of Cat 1 and associated certification status and certification centres where they got their certification:

f) Date of last recertification of the Cat 1:

g) Were any RFWs issued for ESA skills certification centre personnel?

h) Teaching infrastructure/classrooms are adequate (Y/N):

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Requirements:

Equipment/Tool	Details	Compliant/Not Compliant	Action
Lightening	1. Solder area 2. Lead forming area 3. Degolding/pretining area 4. Inspection area		
Soldering tool			
Desoldering tool			
Degolding bath	Temperature:		
Pretining bath	Temperature:		
Cleaning bath			
Temperature control for solder iron and degolding and pretining bath			
Microscope available for soldering	Min/Max magnification		
Inspection tool	Min/Max magnification		
ESD wrist			
Gloves or finger cots			
Use of fume extraction			
Lead forming tool			
Availability of components			

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Equipment/Tool	Details	Compliance/Not Compliant	Action
Well maintained tools			
Classification of the room (clean room, grey room, not classified)			
Labelling of the consumable (solder wire, flux, cleaning solvent,...)			
Expiry date of consumable			
Availability of consumable			

Suggestions:

Equipment/Tool	Details	Good to have	Recommendation
ESD bench			
ESD chair			
ESD floor			
ESD blouse			
ESD control at entrance of the room			

- i) Procedures exist to cover the certification of each Process, those include:
- Written detailed component preparation, assembly procedures, inspections, etc...
 - Examples of acceptable/rejected workmanship described in the process standards.
 - Process for signature of the certificates (signature owner, maximum duration for signature with regards to completion of the certification).
 - Management of complains.
- j) Course Outlines exist describing aims; experience and pre-requisites; duration and syllabus. preferred individual course outlines are distributed by ESA as shown in Annexes 3 – 10 of this document.
- k) ESA-approved examination suggestions are followed; for instance, the question papers and the certification centre printed circuit board.
- ECSS-Q-ST-70-26: X questions
- ECSS-Q-ST-70-61 Cat 3: X questions

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ECSS-Q-ST-70-61 Cat 2: X questions
 ECSS-Q-ST-70-30: X questions
 ECSS-Q-ST-70-18: X questions
 ECSS-Q-ST-70-28: X questions

l) Course fees are established (Y/N):

4) RECORDS

- a) The centre shall maintain records of personnel certification and performance for 4 years:
 - Certificate in compliance with Annex 2.
 - The introduction letter will identify the following:
 - That the certificate is the property of ESA skills certification centre.
 - That any interruption of more than 9 months invalidates the certificate.
 - In case of notified problems, the company shall inform ESA skills certification centre.
 - ESA skills certification centres inform ESA in case complaints are made by their customer whatever is the nature of the complaint.
 - b) Details of the employer together with either the employer's address or the address of the candidate.
 - c) The application form is kept with the applicant dossier.
 - d) A RFW is issued in case the application is not in compliant with the ESA STR-258.
 - e) Certification category attained.
 - f) Date of certification or re-certification.
 - g) Marked written test papers (examination) exist and are suitably stored.
 - h) Trainee-assembled test specimens exist and are suitably stored.
 - i) Information regarding withdrawal of certified status (see also 7b).
- 3 causes for suspension:
- Visual Acuity requirements not met,
 - Generic poor solder or inspection quality (information from ESA, from the customer or third party),
 - Abuse of certification status (Cat 2 being not Cat 2).
- j) A list of Certified Operators, Inspectors and Instructors exists.

5) CERTIFICATES issued by ESA Approved Skills Centres

- a) Certificates having ESA-agreed layouts and logos are issued to operators, inspectors and instructors who have successfully completed the individual certification.
- b) Details of the certification (processes, standard identification) and validity dates are stated on the certificate.
- c) Authorisation signatures exist on the certificates.

6) CERTIFICATES Issued by In-house Cat 1

- a) Certificates for recertification having ESA-agreed layouts without ESA logos are issued to operators, inspectors who have successfully completed the individual re-certification.
- b) Details of the re-certification (processes, standard identification) and validity dates are stated on the certificate.
- c) Authorisation signatures exist on the certificates.

7) ADDITIONAL FACTS

- a) Courses are presented in which language(s)?
- b) Centre has adequately assessed the marketing of courses (related to sustainability of centre)?
- c) A website or booklet summarising the ESA-approved course outlines exists:
It should contain a description of what is meant by Certification to Categories 3, 2 and 1;
 - any pre-requisites for the candidates;
 - the course fees,
 - addresses of local hotels or residences and details of the preferred means to reach the Centre (including a local map).
- d) Centre has the resources (human and physical) to meet the standards.
- e) The Centre Manager and Cat 1 have attended the Annual Skills certification Centre Meetings.
- f) A list of Certified Instructors (Category 1) is forwarded to the ESA nominated Technical Manager.

8) INVESTIGATION OF COMPLAINTS

- a) Have formal complaints been received?
- b) Where a trainee complains about a certification centre: ESA nominated Technical Manager will investigate and take any action and may withdraw centre Certification.
- c) Did an employer inform the centre about unsatisfactory work performed by a certified operator or inspector (e.g. related to space hardware failures, rejected workmanship at mandatory inspection points (MIPS) or non-conformance reports (NCRs)?
If so, the responsible ESA Centre Manager shall take action and may withdraw operator or inspector certification.
- d) Was the feedback form from the students considered for improvement? To provide example(s).

9) INSPECTION OF WORKMANSHIP OF THE TEST SPECIMENS

Auditors will take a sample of stored specimens and inspect it.

10) SUMMARY OF FINDINGS AND CORRECTIVE ACTIONS NECESSARY11) CONCLUSION TO THIS ASSESSMENT, AUDIT AND MONITORING EXERCISE

Based on this Assessment Report, the ESA assessor recommends to the ESA Technical nominated Manager:

AWARDS ESA APPROVAL of the Skills certification Centre

AWARDS AN EXTENSION to the scope of the Approval provided by the Centre

REDUCES OR WITHDRAWS the Approval provided by ESA to the Centre:

CONDITIONALLY SUITABLE providing completion of actions.

12) SIGNATURES

Audit assessment carried out by: (ESA Technical Manager or Assessor):

In the presence of Centre Manager:

Date:

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ANNEX 2

EXAMPLE OF ESA CERTIFICATES

Please note that in-house re-certification certificates must not carry ESA logo.

ESA-Approved Skills Certification Centre Logo	 → THE EUROPEAN SPACE AGENCY
Certificate Serial No. 0000	
CERTIFICATE this is to certify that John Smith <i>is authorised to perform operations in conformance with ECSS-Q-ST-70-61 [wiring, THT (70-08), SMT (70-38)], ECSS-Q-ST-70-28, ECSS-Q-ST-70-18, ECSS-Q-ST-70-26 and ECSS-Q-ST-70-30</i> (Category 3) Date of issue: <i>January 2022</i> Date of expiry*: <i>January 2024</i> _____ <i>Name</i> ESA-certified Instructor or centre Manager * Any interruption of certified activities of more than 9 months invalidates the certificate	

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ESA-Approved Skills
Certification Centre
Logo



→ THE EUROPEAN SPACE AGENCY

Certificate Serial No. 0000

CERTIFICATE

this is to certify that

John Smith

is authorised to inspect assembly operations in conformance with ECSS-Q-ST-70-61 [Wiring (70-08), THT (70-08), SMT (70-38)], ECSS-Q-ST-70-28, ECSS-Q-ST-70-18, ECSS-Q-ST-70-26 and ECSS-Q-ST-70-30

(Category 2)

Date of issue: *January 2022*

Date of expiry*: *January 2024*

Name

ESA-certified Instructor or centre Manager

* Any interruption of certified activities of more than 9 months invalidates the certificate

ESA-Approved Skills
Certification Centre
Logo



→ THE EUROPEAN SPACE AGENCY

Certificate Serial No. 0000

CERTIFICATE

this is to certify that

John Smith

is authorized to instruct, examine, inspect and perform, according to ESA-STR-258 and in conformance with ECSS-Q-ST-70-61 [wiring, THT (70-08), SMT (70-38)], repair and modification in conformance with ECSS-Q-ST-70-28, RF cable assembly operations in conformance with ECSS-Q-T-70-18, crimping operations in conformance with ECSS-Q-ST-70-26 and wire-wrapping operations in conformance with ECSS-Q-ST-70-30

(Categories 1, 2 & 3)

Date of issue:

Date of expiry*:

Name

ESA-certified Instructor or Centre Manager

Name

ESA-Structure, Mechanisms and Materials Division (TEC-M)

Name

ESA-Technical Reliability and Quality Division (TEC-Q)

* Any interruption of certified activities of more than 9 months invalidates the certificate

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ESA-Approved Skills Certification Requirements - Electronic Assembly Domain

→ THE EUROPEAN SPACE AGENCY

Date 26/06/2026

ANNEX 3

ESA Course Outline: ECSS-Q-ST-70-61 Hand soldering Operator for Through Hole Devices, Wires, Terminals, solder cups and cables

This ESA-approved course provides requirements on materials and processes needed to assemble reliable electronic hardware limited to through hole technology and confirms the practical skills and theoretical knowledge necessary to fulfil the task of ESA Soldering Operator.

These requirements are designed to ensure process consistency and acceptable workmanship standards resulting in the production of high-reliability hand-soldered connections.

ECSS-Q-70-61 limited to, Material selection, preparation prior mounting and soldering, components mounting requirements prior soldering, attachment of conductors to terminals, solder cups and cables, Manual Assembly to terminals and through hole devices and post soldering process and inspection requirements, forms the basis for this course.

This course is intended for Production Operators with the objective to confirm practical hands-on experience necessary to ensure reliable soldered connections.

All necessary tools and equipment are supplied, although delegates are welcome to bring their own hand tools if desired.

1. COURSE AIMS

- To review and understand the requirements of ECSS-Q-ST-70-61.
- To identify the factors which influence the quality, reliability and performance of a solder joint
- To confirm correct hand-assembly methods and reliably produce joints to the standards demanded by ECSS-Q-ST-70-61 for wire and THT
- To confirm the skills required for successful placement and hand soldering of leaded components and terminals and wiring
- To confirm the ability to examine and analyse faults associated with solder joints in accordance with ECSS-Q-ST-70-61C

2. EXPERIENCE AND PRE-REQUISITES

- Intended for Production Operators.
- Applicants must be trained on the standard and the company processes by the company instructor. The achievement of a sufficient skills levels shall be assessed by the employers in all aspects before applying for the course.
- minimum of 2 years with electronic components and manual assembly processes
- a positive attitude to high quality workmanship
- an application form countersigned by the employer must be submitted by the applicant and approved by the ESA Centre before booking would be accepted.
- a conforming visual acuity certificate held by the employer and certified by countersignature on the course application form.

3. COURSE CONTENT

- Introductions & orientation, including safety, facilities, routines and break times.
- Course introduction: what we will be studying, how, why and when.
- Review of specification framework: relevant ECSS specifications; release status and how to access them.

- **ECSS-Q-70-61 Study:**
 - Scope, Terms & Definitions, Principles & Prerequisites.
 - Preparatory conditions.
 - Materials selection.
 - Preparation for soldering.
 - a. Demonstrate the use of cutters, strippers, anti-wicking tools and solder pot for the preparation of wires; the class can then prepare their own wires for subsequent terminal soldering exercises.
 - b. Preparation of components, lugs and terminals such as degolding and pretining. Components that will be assembled at later stage.
 - c. Mounting of components prior soldering and assembly of conductors to terminals, solder cups and cables.
 - d. Component lead forming,
 - e. Assembly of previously prepared wires to terminals (turret terminal, Bifurcated bottom, side and top routes) that have been previously degolded and pretined with excess of solder being wicked off,
 - f. Assembly of hook connection,
 - g. Assembly of a wire in a solder cup used for connector,
 - h. Assembly of three wires using the splicing procedure. Assembly of a wire to a cable shield,
 - i. Assembly of heat shrinkable sleeve,
 - Assembly to PCBs
 - Final Inspection

4. PRACTICAL TEST

- a) Demonstrate the use of cutters, strippers, anti-wicking tools and solder pot for the preparation of wires; the class can then prepare their own wires for subsequent terminal soldering exercises.
- b) Preparation of components, lugs and terminals such as degolding and pretining. Components that will be assembled at later stage.
- c) Component lead forming,
- d) Assembly of previously prepared wires to terminals (turret terminal, Bifurcated bottom, side and top routes) that have been previously degolded and pretined with excess of solder being wicked off,
- e) Assembly of hook connection,
- f) Assembly of a wire in a solder cup used for connector,
- g) Assembly of three wires using the splicing procedure.
- h) Assembly of a wire to a cable shield,
- i) Assembly of heat shrinkable sleeve,
- j) Assembly of 3 large axial-leaded components

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- k) Assembly of 3 small axial-leaded components (glass bodied) using various stress-relief forms and spacing
- l) Assembly of 3 radial-leaded components (horizontal and vertical mounting)
- m) Assembly of 3 metal-can (e.g. TO92) components using appropriate lead forms
- n) Assembly of 2 DIL components, one mounted on a high-heat-capacity site
- o) Solder terminal to board using Sn96 solder, then assembly of wire(s) to it using Sn63 solder
- p) Solder wire tails from above terminal, into plated through holes
- q) Solder 2 connectors one being a Sub-D connector and one wired connection
- r) Final Inspection

5. PRACTICAL TEST CONDITIONS FOR CERTIFICATION:

All students are required to achieve successfully a minimum of 80% of the assembly after a maximum of 1 rework per package. Additional rework can be requested to achieve a 100% successful assembly.

MULTIPLE-CHOICE THEORY:

- **Wiring limited certification:** All students are required to achieve a minimum of 80% of 25 questions.
- **THT and wiring certification:** All students are required to achieve a minimum of 80% of 30 questions.

6. CERTIFICATE

In accordance with this document, a category 3 Certificate will be awarded on successful completion of the course.

The certificate is valid for two years.

7. DURATION

Minimum 35 hours (Wiring and THT)

Minimum 21 hours (Wiring limited)

8. RECERTIFICATION

To renew certification for a further two years, attendance at a:

Wiring and THT: minimum 14 hours recertification course is required

Wiring limited: minimum 7 hours recertification course is required

ANNEX 4

ESA Course Outline: ECSS-Q-ST-70-61 Hand soldering Operator for SMT

This ESA-approved course develops an understanding of the practical advantages to be gained in designing and building using surface mount technology. The course has a practical bias including hand soldering as well as the methods of applying solder paste and available reflow heat sources. The course follows the requirements of ECSS-Q-ST-70-61, “High-reliability assembly for surface-mount and through hole connections. This course objective is to confirm practical hands-on experience necessary to ensure reliable soldered connections. All necessary tools and equipment are supplied.

1. COURSE AIMS

- To review and understand the requirements of ECSS-Q-ST-70-61.
- To identify the factors which influence the quality, reliability and performance of a solder joint
- To confirm correct hand-assembly methods and reliably produce joints to the standards demanded by ECSS-Q-ST-70-61 for SMT
- To confirm the skills required for successful placement and hand soldering of leadless surface-mount components
- To identify methods of applying solder paste and gain practical experience of metered dispensing
- To become familiar with a range of reflow heat sources and their effect on the solderability of surface mount devices
- To demonstrate the advantages of surface-mount assembly.
- To confirm the ability to examine and analyse faults associated with solder joints in accordance with ECSS-Q-ST-70-61C

2. EXPERIENCE AND PRE-REQUISITES

- Intended for Production Operators.
- Prior to taking this course, applicants shall hold ECSS-Q-ST-70-61 THT + wiring certificate.
- Applicants must be trained on the standard and the company processes by the company instructor. The achievement of a sufficient skills levels shall be assessed by the employers in all aspects before applying for the course.
- Minimum of 2 years with electronic components and assembly processes
- a positive attitude to high quality workmanship
- an application form countersigned by the employer must be submitted by the applicant and approved by the ESA Centre before booking would be accepted.
- a conforming visual acuity certificate held by the employer and certified by countersignature on the course application form.

3. COURSE CONTENT

- Introductions & orientation, including safety, facilities, routines and break times
- Course introduction: what we will be studying, how, why and when

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- Review of specification framework: relevant ECSS specifications; release status and how to access them
- Review of specification framework: relevant ECSS standards; release status and how to access them
- **ECSS-Q-70-61 Study:**
 - Scope, Terms & Definitions, Principles & Prerequisites
 - Preparatory conditions,
 - Materials selection
 - Preparation for soldering
 - Mounting of components
 - Cleaning of PCB assemblies
 - Final Inspection

4. PRACTICAL TEST SMT (Assembly onto ESA-approved certification PCB)

As a minimum the following components covered by the standard shall be assembled:

- a) 6 Chip Capacitors (sizes 0603 and/or 0805 and 1825 and/or 2220 and 2225);
- b) 4 Chip resistors (sizes 0805 and 2512);
- c) 4 Chip resistors (sizes 0201 and/or 0402);
- d) 2 Tantalum capacitors;
- e) 2 Cylindrical components (D-Melf or DO213);
- f) 1 FP 14 or SOIC 14 and/or 1FP 16 or 1 SOIC 16;
- g) 2 SOT 23
- h) 2 LCC3 or 2 LCC4
- i) 1 LCC16 or LCC20
- j) 1 QFP208 (pitch 0,5 mm) or 1 QFP100 (pitch 0,5 mm)
- k) 1 PLCC20 or 1 PLCC32DPAK

Corrective instructions will be given as required.

- a) Clean the board and complete own-board inspection
- b) Review own-board inspection with Instructor
- c) Undertake maximum one rework when required

5. PRACTICAL TEST CONDITIONS FOR CERTIFICATION:

All students are required to achieve successfully a minimum of 80% of the assembly after a maximum of 1 rework per package. Additional rework shall be requested to have a 100% successful assembly.

6. MULTIPLE-CHOICE OPERATOR THEORY TEST

All students are required to achieve a minimum of 80% of 25 questions.

7. CERTIFICATE

In accordance with this document, a category 3 Certificate will be awarded on successful completion of the course.

The certificate is valid for two years.

8. DURATION

Minimum 28 hours.

9. RECERTIFICATION

To renew certification for a further two years, attendance at a minimum 14-hour recertification course is required.

ANNEX 5

ESA Course Outline: ECSS-Q-ST-70-61 Inspector

This ESA-approved course develops an understanding of an ability to interpret, specifications covering high-reliability and high-quality electronic assemblies, and ensures that sufficient knowledge is gained to make confident decisions within the parameters of the specifications with an understanding of the use of materials in the space environment.

These requirements are designed to ensure process consistency and acceptable workmanship standards resulting in the production of high-reliability hand-soldered connections. ECSS-Q-ST-70-61 High-reliability assembly for surface-mount and through hole connections form the basis for this course.

This course is intended for Production Inspectors, and for Operators wishing to extend their certification to Inspection. Engineers and Technicians from Quality Assurance, Design and Manufacturing can also benefit from the course.

1. COURSE AIMS

- To review and understand the requirements of ECSS-Q-ST-70-61.
- To identify the factors which influence the quality, reliability and performance of a solder joint.
- To develop ability to examine and analyse faults associated with solder joints in accordance with ECSS-Q-ST-70-61.
- To be able to inspect and evaluate electronic assemblies according to ECSS-Q-ST-70-61.

2. EXPERIENCE AND PRE-REQUISITES

- Familiarity with electronic components and assembly processes.
- Good practical and observational skills.
- A positive attitude to high quality workmanship.
- Applicants must be trained on the standard and on the company processes by the company instructor. The achievement of a sufficient skills levels shall be assessed by the employers in all aspects before applying for the course.
- 2 years of inspection experience.
- Hold a Category 3 certificate for ECSS-Q-ST-70-61 in the domain for which the certification is requested.
- An application form countersigned by the employer must be submitted by the applicant and approved by the ESA Centre before booking would be accepted.
- A conforming visual acuity certificate held by the employer and certified by countersignature on the course application form.

3. COURSE CONTENT

- Introductions & orientation, including safety, facilities, routines and break times.
- Course introduction: what we will be studying, how, why and when.
- Review of specification framework: relevant ECSS standards; release status and how to access them.

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- ECSS-Q-ST-70-61 Study:
 - Scope, Terms & Definitions, Principles & Prerequisites
 - Component designations
 - Preparatory conditions, Materials selection
 - Preparation for soldering
 - Mounting of through holes components and wires
 - Attachment of conductors to terminals, solder cups and cables
 - Mounting of Surface Mounted components
 - Typical satisfactory and unsatisfactory solder connections
 - View Inspection slides

4. EXAMINATION

- Inspection of assembled PCBs populated with components below •

A selection of different types of components covered by the standard shall be inspected, as a minimum:

- PCB having been assembled during ECSS-Q-ST-70-61 Cat 3 certification with defects
 - a. Degolding/ pretinning/ lead forming
 - b. Assembly of PTH components
 - c. Assembly of conductors to terminals
 - d. Assembly of bifurcated terminals
 - e. Assembly of terminals such as hook terminals, pierced terminals
 - f. Assembly of solder cups
 - g. Assembly of wire and cable interconnection
 - h. Assembly of wires on the PCB
 - i. Assembly of coax cables to PCB
 - j. Assembly of terminals to PCBs
 - k. Assembly of SMDs
- All students shall identify 100% of defects present on the inspected boards.
- Multiple-choice inspector test:
 - **Wiring limited certification:** All students are required to achieve a minimum of 80% of **25** questions.
 - **THT and wiring certification:** All students are required to achieve a minimum of 80% of **50** questions.

5. CERTIFICATE

In accordance with this document, a category 2 Certificate will be awarded on successful completion of the course.

The certificate is valid for two years.

6. DURATION

Wiring certification: minimum 16 hours

Wiring and THT certification: minimum 28 hours

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SMT, THT and wiring certification: minimum 35 hours

7. RECERTIFICATION

To renew certification for a further two years, attendance at a:

Wiring: minimum 7 hours

Wiring and THT certification: minimum 10 hours

SMT, THT and wiring certification: minimum 14 hours

ANNEX 6

ESA Course Outline: RF Cable Assembly Operator ECSS Standard ECSS-Q-ST-70-18

This ESA-approved course is designed to review the practical skills and theories associated with the solder assembly, formation and preconditioning of semi-rigid RF cables. The course is based on the Solder Assembly requirements of ECSS-Q-ST-70-18, “The Preparation, Assembly and Mounting of RF Coaxial Cables”.

This course is intended for Production Operators, Quality Assurance Engineers and Design and Manufacturing Engineers.

This course objective is to confirm practical hands-on experience necessary to ensure reliable soldered connections. All necessary tools and equipment are supplied although delegates are welcome to bring their own hand tools if desired.

1. COURSE AIMS

- To review and understand the requirements of ECSS-Q-ST-70-18.
- To identify the factors which influence the quality, reliability and performance of the assembly and its solder joints.
- To verify appropriate skills and correct hand assembly methods.
- To be able to examine and analyse faults associated with the assembly.

2. EXPERIENCE AND PRE-REQUISITES

- Applicants must be trained on the standard and the company processes by the company instructor. The achievement of a sufficient skills levels shall be assessed by the employers in all aspects before applying for the course.
- an application form must be submitted, countersigned by the employer and approved by the ESA Centre before booking would be accepted.
- a conforming visual acuity certificate held by the employer and certified by countersignature on the course application form.
- Hold a Category 3 certificate for ECSS-Q-ST-70-61 limited wiring

3. COURSE CONTENT

- Introductions & orientation, including safety, facilities, routines and break times
- Course introduction: what we will be studying, how, why and when
- Review of specification framework: relevant and ECSS specifications; release status and how to access them
- ECSS-Q-ST-70-61 general topics and the part specific for preparation and wiring of the specification
- Presentation of ECSS-Q-70-18:
 - Check tools & RF Toolkit
 - Cable forming
 - Cable preconditioning
 - Dimensional checking
 - Degolding & pretinning

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- Connector types
- Soldering methods
- Connector & dielectric trimming
- Centre pin soldering
- Degolding connector body
- Cable construction
- Own-work Inspection
- Review own-work Inspection
- Section end product if appropriate
- Clean-up & Check Tools
- Certification

4. EXAMINATION

- **Practical test:** Build of an RF cable, inspect own work.

All students are required to achieve successfully a minimum of 100% of the assembly after 1 rework.

- **Multiple-choice operator theory test:** All students are required to achieve a minimum of 80% of 20 questions.

5. CERTIFICATE

In accordance with this document, an ESA approved, category 3 certificate will be awarded on successful completion of the course. Candidates already holding a valid ECCS-Q-ST-70-61 (wiring) category 2 Inspector's certificate will be eligible to receive a category 2 certificate for this subject.

The certificate is valid for two years.

6. DURATION

Minimum 21 hours

7. RECERTIFICATION

To renew certification for a further two years:

Minimum 7 hours

ANNEX 7

ESA Course Outline: RF Cable Assembly Inspector ECSS Standard ECSS-Q-ST-70-18

This ESA-approved course develops an understanding of an ability to interpret, specifications covering high-reliability and high-quality electronic assemblies, and ensures that sufficient knowledge is gained to make confident decisions within the parameters of the specifications with an understanding of the use of materials in the space environment.

These requirements are designed to ensure process consistency and acceptable workmanship standards resulting in the production of high-reliability hand-soldered RF cable connections. ECSS-Q-ST-70-18 RF Cable Assembly Inspector form the basis for this course.

This course is intended for Production Inspectors, and for Operators wishing to extend their certification to Inspection. Engineers and Technicians from Quality Assurance, Design and Manufacturing can also benefit from the course.

1. COURSE AIMS

- To review and understand the requirements of ECSS-Q-ST-70-18.
- To identify the factors which influence the quality, reliability and performance of a solder joint.
- To develop ability to examine and analyse faults associated with solder joints in accordance with ECSS-Q-ST-70-18.
- To be able to inspect and evaluate electronic assemblies according to ECSS-Q-ST-70-18.

2. EXPERIENCE AND PRE-REQUISITES

- Familiarity with electronic components and assembly processes.
- Good practical and observational skills.
- Positive attitude to high quality workmanship.
- Applicants must be trained on the standard and the company processes by the company instructor. The achievement of a sufficient skills levels shall be assessed by the employers in all aspects before applying for the course.
- 2 years of inspection experience.
- Hold a Category 2 certificate for ECSS-Q-ST-70-61 in the domain for which the certification is requested.
- An application form countersigned by the employer must be submitted by the applicant and approved by the ESA Centre before booking would be accepted.
- A conforming visual acuity certificate held by the employer and certified by countersignature on the course application form.

3. COURSE CONTENT

- Introductions & orientation, including safety, facilities, routines and break times.
- Course introduction: what we will be studying, how, why and when.

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- Review of specification framework: relevant and ECSS specifications; release status and how to access them.
- ECSS-Q-ST-70-61 general topics and the part specific for preparation and wiring of the specification.
- Presentation of ECSS-Q-70-18.

4. EXAMINATION

- **Inspection of assembled RF cables**

All students shall identify 100% of defect present on the assembled semi rigid cables.

- **Multiple-choice inspector test:**

All students are required to achieve a minimum of 80% of **25** questions.

5. CERTIFICATE

In accordance with this document, a category 2 Certificate will be awarded on successful completion of the course.

The certificate is valid for two years.

6. DURATION

Minimum 14 hours

7. RECERTIFICATION

To renew certification for a further two years.

Minimum 7 hours.

ANNEX 8

ESA Course Outline: Crimping Operator/Inspector ECSS Standard: ECSS-Q-ST-70-26

This ESA-approved course provides basic information on the use of materials in the space environment and is designed to review the practical skills and theories associated with the Crimping Processes. The course is based on ECSS standards ECSS-Q-ST-70-26 “The Crimping of High-Reliability Electrical Connections”.

This course is intended for Production Operators. Engineers from Quality Assurance, Design and Manufacturing also benefit from the course. The course provides practical hands-on experience. All necessary tools and equipment are supplied, although delegates are welcome to bring their own hand tools if they wish.

1. COURSE AIMS

- To review and understand the requirements of the ECSS-Q-ST-70-26.
- To identify the factors which influence the quality, reliability and performance of Crimped connections.
- To develop correct assembly and testing methods.
- To confirm ability to identify and analyse faults associated with these termination methods.

2. EXPERIENCE AND PRE-REQUISITES

- Minimum 1 year experience with electronic crimping.
- Applicants must be trained on the standard and the company processes by the company instructor. The achievement of a sufficient skills levels shall be assessed by the employers in all aspects before applying for the course.
- A positive attitude to high quality workmanship.
- an application form must be submitted, countersigned by the employer and approved by the ESA Centre before booking would be accepted.
- a conforming visual acuity certificate held by the employer and certified by countersignature on the course application form.

3. COURSE CONTENT

- Introductions & orientation, including safety, facilities, routines and break times.
- Course introduction: what we will be studying, how, why and when.
- Review of specification framework: relevant ECSS standards; release status and how to access them.
- Theory of solderless connection methods.
- Knowledge of critical parameters affecting quality and function of connections.
- Presentation of ECSS-Q-ST-70-26:
 - Tools & gauges
 - Crimp formats
 - Wire and terminal selection and preparation
 - Tensile testing sample connections

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- Dispersive crimping
- Use of spreadsheet; variance and process capability
- Analysis of results
- Compactive crimping
- Analysis of results
- Own-work Inspection
- Clean-up & Check Tools
- Certification

Prior the practical test each applicant will make a crimp that will be used to define the optimal setting. A curve with all samples will be drawn to determine the optimum setting.

- Inspection by the student of all the crimp to see the difference.
- Tensile test will be operated by the instructor.
- Inspection by the student of all the failed crimp to see the difference.

4. EXAMINATION

Cat 3

- **Practical test:** Samples are generated,

As a minimum:

- a. 4 contacts with single wire,
- b. 4 contacts with 2 wires,
- c. 4 splice or lug.

For each configurations the candidate shall produce the samples using the qualified setting defined by Certification Centre and assess as if a start of shift set.

- Results are recorded and analysed.

All students are required to achieve successfully 100% of the assembly.

Cat3/Cat2

- **Practical test:** Samples are generated,

As a minimum:

- a. 4 contacts with single wire,
- b. 4 contacts with 2 wires,
- c. 4 splice or lug.

For each configurations the candidate shall produce the samples using the qualified setting defined by Certification Centre and assess as if a start of shift set.

- Results are recorded and analysed.

- Crimped workmanship inspection

All students are required to achieve successfully 100% of the assembly.

Multiple-choice theory test:

- All Cat 3 students are required to achieve a minimum of 80% of a minimum 25 questions.
- All Cat 3/Cat 2 students are required to achieve a minimum of 80% of min 35 questions.

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5. CERTIFICATE

In accordance with this document, an ESA approved, category 2 and 3 Certificate will be awarded on successful completion of the course.

The certificate is valid for two years.

6. DURATION

Cat 3: Minimum 14 hours

Cat 3/2: Minimum 14 hours

7. RECERTIFICATION

To renew certification for a further two years, attendance to a 1-day recertification course is required.

ANNEX 9

ESA Course Outline: Repair and modification of printed circuit boards assemblies for space applications Operator ECSS Standard: ECSS-Q-ST-70-28

This ESA-approved course is designed to review the practical skills and theories associated with the Repair and Modification of Printed circuit boards assemblies. The course is based on ECSS standards ECSS-Q-ST-70-28 “Repair and Modification of Printed circuit boards assemblies for space application” associated with the requirements of the ECSS-Q-ST-70-61C.

This course is intended for Production Operators. Engineers from Quality Assurance, Design and Manufacturing also benefit from the course. The course provides practical hands-on experience. All necessary tools and equipment are supplied, although delegates are welcome to bring their own hand tools if they wish.

1. COURSE AIMS

- To review and understand the requirements of the ECSS-Q-ST-70-28 associated with the requirements of the ECSS-Q-ST-70-61.
- To identify the factors which influence the quality, reliability and performance of repair and modification operation of printed circuit board assemblies.
- To make a range of repair and modification of printed circuit board assemblies, to understand hand-assembly methods necessary to produce reliable repair and modification in compliance with ECSS-Q-ST-70-28 and ECSS-Q-ST-70-61.
- To confirm ability to examine and analyse faults associated with repair and modification solder joints in accordance with ECSS-Q-ST-70-28 and ECSS-Q-ST-70-61.

2. EXPERIENCE AND PRE-REQUISITES

- Intended for Production Operators and Inspectors.
- Hold a Category 3 for ECSS-Q-ST-70-61 SMT and/or Wiring and THT.
- Applicants must be trained on the standard and the company processes by the company instructor. The achievement of a sufficient skills levels shall be assessed by the employers in all aspects before applying for the course.
- a positive attitude to high quality workmanship.
- an application form countersigned by the employer must be submitted by the applicant and approved by the ESA Centre before booking would be accepted.
- a conforming visual acuity certificate held by the employer and certified by countersignature on the course application form.

3. COURSE CONTENT

- Introductions & orientation, including safety, facilities, routines and break times.
- Course introduction: what we will be studying, how, why and when.
- Review of specification framework: relevant ECSS standards; release status and how to access them.

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- Review of basic requirements and criteria for repairs and modification.
- Removal of conformal coating.
- Solder joint removal and unclenching.
- Repair of damaged gold-plated areas.
- Repair of damaged conductor tracks.
- Repair of lifted conductor tracks.
- Repair of lifted conductors and terminal areas.
- Replacement of terminal posts.
- Wire to wire joints.
- Addition of components (leaded components, SMD components).
- Removal and replacement of axial and multi lead components (DIL-DIP).
- Removal and replacement of flat pack components (leads cut and without leads cut).
- Modification of component connections (Leaded devices: cutting a lead and not cutting leads and wiring, SMD: Addition of a wiring connection).
- Cutting of internal tracks of a multi-layer printed circuit board.
- Removal of components using different techniques.

4. EXAMINATION

Practical exercises (Assembly onto ESA-approved certification PCB)

A selection of different types of repairs and modification covered by the standard shall be fitted, typically:

- a. Optional: repair of a lifted track.
- b. Repair of a lifted pad.
- c. Interruption of a track.
- d. Repair of track.
- e. Implementation of a modification including of either ceramic chip capacitor, ceramic chip resistor or tantalum chip capacitor, with use of patch PCB as applicable.
- f. Wire to wire joints.
- g. Removal and replacement of chip components.
- h. Addition of leaded components.
- i. Addition of leaded component on another component lead.
- j. Addition of a chip resistor bonded and wired.
- k. Wiring of a chip resistor and/or Melf assembled on its pad.
- l. Bonding and soldering a DIL upside down.
- m. Removal and replacement of multi lead through hole components (DIL-DIP, TO can).
- n. Removal and replacement of flat pack or SOIC components or QFP component.
- o. Modification of component connections.
- p. Through hole leaded component: cutting a lead and wiring.
- q. SMD such as FP or QFP or SOIC not cutting leads and wiring.
- r. Assembly of a chip capacitor with associated wire soldered at the same time than chip.
- s. Removal of parts shall be done using different methods.

Corrective instruction will be given as required.

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- Undertake rework as required.
- Clean the board and complete own-board Inspection.
- Review own-board inspection with Instructor.
- Undertake rework as required.
- Review own-board inspection with Instructor.

All students are required to achieve successfully a minimum of 80% of the assembly after a maximum of 1 rework per package. Additional rework shall be requested to have a 100% successful assembly.

- All students are required to have identified a minimum of 100% of defect on the inspected boards.

Multiple-choice operator test:

All students are required to achieve a minimum of 80% of **25** questions.

5. CERTIFICATE

In accordance with this document, an ESA approved category 3 Certificate will be awarded on successful completion of the course for Operators.

The certificate is valid for two years.

6. DURATION

Minimum 35 hours

7. RECERTIFICATION

To renew certification for a further two years, attendance at a minimum of 14 hours recertification course is required.

As a minimum the following shall be performed.

- a. Interruption of a track.
- b. Repair of track.
- c. implementation of a modification including of either ceramic chip capacitor, ceramic chip resistor or tantalum chip capacitor, with use of patch PCB as applicable.
- d. Removal and replacement of chip components.
- e. Addition of leaded components.
- f. Addition of a chip resistor bonded and wired.
- g. Wiring of a chip resistor and/or MELF assembled on its pad.
- h. Removal and replacement of multi lead through hole components (DIL-DIP, TO can).

ANNEX 10

ESA Course Outline: Repair and modification of printed circuit boards assemblies for space applications. Inspector ECSS Standard: ECSS-Q-ST-70-28

This ESA-approved course is designed to review the practical skills and theories associated with the Repair and Modification of Printed circuit boards assemblies. The course is based on ECSS standards ECSS-Q-ST-70-28 “Repair and Modification of Printed circuit boards assemblies for space application” associated with the requirements of the ECSS-Q-ST-70-61C.

This course is intended for Production Inspectors, Quality inspectors, Engineers from Quality Assurance, Design and Manufacturing also benefit from the course. All necessary tools and equipment are supplied.

1. COURSE AIMS

- To review and understand the requirements of the ECSS-Q-ST-70-28 associated with the requirements of the ECSS-Q-ST-70-61.
- To identify the factors which influence the quality, reliability and performance of repair and modification operation of printed circuit board assemblies.
- To confirm ability to examine and analyse faults associated with repair and modification solder joints in accordance with ECSS-Q-ST-70-28 and ECSS-Q-ST-70-61.

2. EXPERIENCE AND PRE-REQUISITES

- Intended for Production Inspectors and Quality Inspectors.
- Hold a Category 2 for ECSS-Q-ST-70-61.
- Applicants must be trained on the standard and the company processes by the company instructor. The achievement of a sufficient skills levels shall be assessed by the employers in all aspects before applying for the course.
- a positive attitude to high quality workmanship.
- an application form countersigned by the employer must be submitted by the applicant, and approved by the ESA Centre before booking would be accepted.
- a conforming visual acuity certificate held by the employer and certified by countersignature on the course application form.

3. COURSE CONTENT

- Introductions & orientation, including safety, facilities, routines and break times.
- Course introduction: what we will be studying, how, why and when.
- Review of specification framework: relevant ECSS standards; release status and how to access them.
- Review of basic requirements and criteria for repairs and modification.
- Removal of conformal coating.
- Solder joint removal and unclenching.
- Repair of damaged gold-plated areas.
- Repair of damaged conductor tracks.
- Repair of lifted conductor tracks.

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- Repair of lifted conductors and terminal areas.
- Replacement of terminal posts.
- Wire to wire joints.
- Addition of components (leaded components, SMD components).
- Removal and replacement of axial and multi lead components (DIL-DIP).
- Removal and replacement of flat pack components (leads cut and without leads cut).
- Modification of component connections (Leaded devices: cutting a lead and not cutting leads and wiring, SMD: Addition of a wiring connection).
- Cutting of internal tracks of a multi-layer printed circuit board.
- Removal of components using different techniques.
- Inspection of modification and repairs.

4. EXAMINATION

- Inspection of assembled PCBs populated during the certification of the ECSS-Q-ST-70-28 certification.
- Review board inspection with Instructor.
- All students are required to have identified 100% of defect on the inspected boards.

Multiple-choice operator test:

All students are required to achieve a minimum of 80% of **25** questions

5. CERTIFICATE

In accordance with this document, an ESA approved category 2 Certificate will be awarded on successful completion of the course for Inspector.

The certificate is valid for two years.

6. DURATION

Minimum 21 hours

7. RECERTIFICATION

To renew certification for a further two years, attendance at a 14-hour recertification course is required.

ANNEX 11

ESA Course Outline: Wire-Wrapping Operator/Inspector ECSS standard: ECSS-Q-ST-70-30

This ESA-approved course provides basic information on the use of materials in the space environment and is designed to review the practical skills and theories associated with the Wire Wrapping Processes. The course follows the requirement of the ECSS-Q-ST-70-30 “The Wire Wrapping of High-Reliability Electrical Connections”.

This course is intended for Production Operators. The course provides practical hands-on experience. All necessary tools and equipment are supplied, although delegates are welcome to bring their own hand tools if they wish.

1. COURSE AIMS

- To review and understand the requirements of ECSS standard.
- To identify the factors which influence the quality, reliability and performance of Wire Wrapped connections.
- To confirm correct assembly and testing methods.
- To confirm ability to identify and analyse faults associated with these termination methods.

2. EXPERIENCE AND PRE-REQUISITES

- Minimum 1-year electronic wiring.
- a positive attitude to high quality workmanship.
- an application form countersigned by the employer must be submitted by the applicant and approved by the ESA Centre before booking would be accepted.
- a conforming visual acuity certificate held by the employer and certified by countersignature on the course application form.

3. COURSE CONTENT

- Introductions & orientation, including safety, facilities, routines and break times.
- Course introduction: what we will be studying, how, why and when.
- Review of specification framework: relevant ECSS standard; release status and how to access them.
- Theory of solderless connection methods.
- Knowledge of critical parameters affecting quality and function of connections.
- Wire-Wrap Tools.
- Wire-wrap posts and wire selection.
- Wire Wrapping.
- Logging and analysis of results.
- Own-work Inspection.
- Clean-up & Check Tools.
- Certification.

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4. EXAMINATION

- **Practical test:** Samples are generated and inspected.
 - a. Assembly on a post of dimension 0.64X0.64 with a wire of AWG30
 - b. Assembly on a post of dimension 0.64X0.64 with a wire of AWG28

All students are required to achieve successfully a minimum of 100% of the assembly.

Multiple-choice operator theory test: All students are required to achieve a minimum of 80% of 25 questions.

5. CERTIFICATE

In accordance with this document, an ESA approved, category 3 and category 2 Certificate will be awarded on successful completion of the course.

The certificate is valid for two years.

6. DURATION

Minimum 14 hours.

7. RECERTIFICATION

To renew certification for a further two years, attendance at a 1-day recertification course is required.

ANNEX 12

ESA Course Outline: Instructor CATEGORY 1

This ESA-approved course verifies the practical skills and theoretical knowledge necessary to fulfil the task of ESA Category 1 Instructor.

1. COURSE AIMS

- To review and understand the content of ESA STR-258.
- To build on existing knowledge of those specifications that the delegate will be required to instruct. These will be taken from the following: 70-18, 70-26, 70-28, 70-30, 70-61.
- To develop instructional and demonstration skills.
- To enable the delegate to manage a certification course, its documentation and the archiving of records and certificates.

2. EXPERIENCE AND PRE-REQUISITES

- Ability to instruct, demonstrate and present.
- At least two years of experience as an inhouse trainer, this must be recorded by the company.
- Possession of a valid Category 2 and Category 3 certificates with a minimum of one recertification as Cat 3 and Cat 2.
- The last re-certification shall be issued by an ESA-approved skills certification centre.
- An application form must be submitted, countersigned by the employer and approved by the ESA-approved Centre before a booking would be accepted.
- A conforming visual acuity certificate held by the employer and certified by counter signature on the course application form.

3. COURSE CONTENT

Week 1

- Introduction and selection of Demonstration and Mini Lecture subjects.
- Presentation of ECSS-Q-ST-10-09;
 - multiple-choice inspector test
- Presentation of ECSS-Q-ST-70-61;
 - multiple-choice test* without available documents (book closed).
- Presentation of ECSS-Q-ST-70-28;
 - multiple-choice test* without available documents (book closed).
- Presentation of ECSS-Q-ST-70-18;
 - multiple-choice test* without available documents (book closed).
- Presentation of ECSS-Q-ST-70-26;
 - multiple-choice test* without available documents (book closed).
- Presentation of ECSS-Q-ST-70-30;
- Multiple-choice test* without available documents (book closed).

* according to those subjects that the participant will be required to instruct.

Week 2

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- Review of ESA STR-258;
 - Multiple-choice test
- Practical assembly exercises as required by each relevant standard (see individual course descriptions).
- Prepare and deliver practical demonstrations for each subject/standard aimed to be certified in.
- Prepare mini lectures for any revisions to relevant standards.

4. CERTIFICATE

In accordance with this document, an ESA Certificate authorising the holder to instruct and examine in selected subjects, will be prepared, on successful completion of the course. This certificate will be submitted to the ESA Technical Manager for validation. After validation, the certificate will be sent to the participant.

The certificate is valid for two years.

Additional subjects can be added after Category 1 certification, at the time of the re-certification.

5. DURATION

Minimum 10 days.

6. RECERTIFICATION

To renew certification for a further two years, attendance at a recertification course is required. This course should be between five and nine days, depending on the number of the subjects re-certifying in.

Instructors who continued to actively practice Inspection and Operator skills and processes in the period since last recertification will maintain their certification in categories 1, 2 and 3.

Instructors who did not continue to actively practice their Inspection or Operator skills will have the new certificates amended to show Category 1 and 2 or Category 1 and 3, respectively.

Instructors who did not actively practice their Inspection and Operator skills will have the new certificates issued as Category 1 only.

ANNEX 13

Request for a waiver template:

ESA-Approved Skills Certification Centre Name / Logo	REQUEST for WAIVER	RFW Nr.: YYYY-Serial No Date: Issue:	Page 1 of 1
	PROGRAMME: ESA Skills Certification		Recurring Yes ☐ No ☐
TITLE:		COURSE SUBJECT:	ECSS:
SPECIFICATION AFFECTED: ESA STR-258			
SECTION:			
DESCRIPTION OF WAIVER:			
NEED FOR AND JUSTIFICATION OF WAIVER: <i>To be filled by Applicant Company</i>			
ESA Centre Position: <i>To be filled by ESA Centre Manager or Instructor on receipt of the form from the Company.</i>			
Participant Employer's Position: <i>To be filled by Applicant Company</i>			
ESA Centre SIGNATURES			
Centre Manager Date:		Centre Instructor Date:	
ESA-ESTEC SIGNATURES			
Approved			
Disapproved	Name:	Date:	

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ANNEX 14

ESA Course Application Forms:

ESA (Re)-Certification Course Application Form – Operator (Cat 3) & Inspector (Cat 2)

The purpose of this form is to assess a candidate's suitability prior to completion of a Certification Booking Form.

Name _____ Position _____
 Department _____ Company _____
 Address _____ Telephone _____
 _____ Email _____

Please fill in the following table for the courses that require registration

ESA Course applied for			
Please enter "C" for certification or "R" for re-certification, as required	Operator Cat 3	Inspector Cat 2	Date of last re-certification and ESA Certification Centre
ECSS-Q-ST-70-61 Wiring			
ECSS-Q-ST-70-61 THT			
ECSS-Q-ST-70-61 SMD			
ECSS-Q-ST-70-18			
ECSS-Q-ST-70-28			
ECSS-Q-ST-70-26			
ECSS-Q-ST-70-30			

The candidate for recertification shall declare any work period interruption greater than 9 months during the period of certification time.

Signatures: _____ (Applicant)

Date: _____

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If you are only Re-certifying in the subjects already held, please skip the next step.

If applying for any first time Certification, please enter details of your experience as an Operator or an Inspector. **Certification courses require a minimum of 2 years of relevant experience for the ECSS-Q-ST-70-61, 70-28, 70-18 and a minimum of 1 year experience for the ECSS-Q-ST-70-26 and 70-30. Experience only counts if your role requires daily involvement with the respective activities.** Please enter the number of years of experience in the corresponding box(es) below.

Experience	Operator	Inspector
THT Solder assembly		
Wiring assembly		
SMT Solder assembly		
RF Cables		
Crimping		
Wire wrapping		

It is the responsibility of the employer to train and qualify their personnel prior to proposing their application for an ESA certification.

Acceptance on, and attendance of, an ESA (re-)certification approved course does not guarantee that the participant will be ESA certified by the end of the course.

The employer is responsible for and shall hold a valid Visual Acuity record for the applicant.

Signatures: _____ (Applicant) _____ (Applicant's Manager)

Date: _____ (Manager's printed name)

ESA Course Application Form

Please email the completed and signed form to: <email address>

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ESA-STR-258 issue 3

ESA (Re-Certification) Course Application Form – Instructor (Cat 1) – STR-258

The purpose of this form is to assess a candidate's suitability prior to completion of a Certification Booking Form.

Name _____ Position _____
 Department _____ Company _____
 Address _____ Telephone _____
 _____ Email _____

If you are only recertifying in the subjects already held, please complete the table below:

ESA Instructor Recertification Subjects applied for				ESA School in which the first Cat 1 certificate was awarded	Is the Instructor still active as an Inspector and/or Operator? [No, I, O, I&O]
Please enter "R" for re-certification, as required	Instructor Cat 1	Inspector Cat 2	Operator Cat 3		
ECSS-Q-ST-70-61 Wiring					
ECSS-Q-ST-70-61 THT					
ECSS-Q-ST-70-61 SMD					
ECSS-Q-ST-70-18					
ECSS-Q-ST-70-28					
ECSS-Q-ST-70-26					
ECSS-Q-ST-70-30					

For first time Instructor Application, please complete the table below against relevant subjects:

ESA Instructor Certification Subjects applied for		ESA Operator history Category 3			ESA School where you gained your first certificate	ESA Inspector history Category 2		ESA School where you gained your first certificate
Please enter "C" for certification, as required	Instructor Cat 1	Year of first certifi- cation	(Two) Most recent (re)- certification Year(s)	Year of first certifi- cation		(Two) Most recent (re)- certification Year(s)		
ECSS-Q-ST-70-08								
ECSS-Q-ST-70-38								
ECSS-Q-ST-70-18								
ECSS-Q-ST-70-28								
ECSS-Q-ST-70-26								
ECSS-Q-ST-70-30								

If you are applying for a Category 1 course in an ESA Certification Centre where you did not gain your first Cat.3/Cat.2 certificates, please provide evidence of your first certifications in both categories in an attachment. »

ESA Course Application Form

Please email the completed and signed form to: <email address>

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ESA-STR-258 issue 3

First time certification for Category 1 requires that applicants have at least two years of experience as an internal trainer and that they are recorded as such by ESA. Acceptance on, and attendance of, an ESA approved course does not guarantee that the participant will be ESA certified by the end of the course. ESA certification is granted on exceeding the minimum workmanship standards and minimum pass criteria for the theoretical examination for each subject and category applied for. The employer is responsible for and shall hold a valid Visual Acuity record for the applicant. >>

Signatures: _____ (Applicant) _____ (Applicant's Manager)
Date: _____ (Manager's printed name)

ESA Course Application Form

Please email the completed and signed form to: <email address>

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ESA-Approved Skills Certification Requirements - Electronic Assembly Domain

→ THE EUROPEAN SPACE AGENCY

Date 26/06/2026