PROCEDURE FOR QUALIFICATIONS

ESCC 12100

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1002	Document upissued to incorporate editorial changes per DCR.

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1 INTRODUCTION

This document sets the procedures to be followed by the ESCC bodies to conduct ESCC qualifications.

ESCC qualification provides for the quality assessment of components, manufacturers and component technologies to establish confidence in their performance, reliability and suitability for space use. The system employs different quality assessment techniques suited to varying industrial component manufacturing and production methods. These are as follows:

- Qualification Approval.
- Capability Approval.
- Technology Flow Qualification.

ESCC qualifications are conducted in accordance with an Annual Qualification Programme (AQP) prepared by the Component Technology Board (CTB) and approved by the Space Components Steering Board (SCSB). The qualification process is supervised by the Executive and successfully completed qualifications are certified by ESA who act as the ESCC Certification Body.

Components, component technologies and component manufacturers certified under the system are eligible for listing either in the Qualified Parts List (QPL) or Qualified Manufacturers List (QML).

2 SCOPE

This document describes the roles and responsibilities of the organisations involved in ESCC qualification and the procedures to be followed.

This document applies to the SCSB, CTB, Executive and ESA.

3 DEFINITIONS AND ABBREVIATIONS

3.1 DEFINITIONS

Qualification	A collective term to describe the overall process leading to the certification of EEE components, technologies or manufacturers' lines to ESCC quality assessment requirements.
Executive	A collective term used to describe the ESCC organisation that comprises resources provided by ESA and national space agencies with the responsibility for the Executive Task.

3.2 ABBREVIATIONS

The following abbreviations are used in this document:

AQP	Annual Qualification Programme
CTB	Components Technology Board
EEE	Electrical, Electronic and Electro-mechanical
EPPL	European Preferred Parts List
ESA	European Space Agency
ESCC	European Space Components Coordination
Executive	ESCC Executive
PID	Process Identification Document
PSWG	Policy and Standards Working Group
QML	ESCC Qualified Manufacturers List
QPL	ESCC Qualified Parts List
SCSB	Space Components Steering Board
TRB	Technical Review Board

4 RELATED DOCUMENTS

4.1 APPLICABLE DOCUMENTS

The following documents are applicable to the extent specified herein:

ESCC 12101	Procedure for the ESA Certification of Qualifications
ESCC 12102	Procedure for Non-conformance Management
ESCC 12200	ESCIES Management Procedure

4.1.1 Applicable ESCC Basic Specifications

No. 20100	Requirements for the Qualification of Standard Electronic Components for Space Applications
No. 20200	Component Manufacturer Evaluation
No. 22600	Requirements for the Evaluation of Standard Electronic Components for Space Applications
No. 22700	Requirements and Guidelines for the Process Identification Document
No. 22800	ESCC Non-conformance Control System
No. 24300	Requirements of Capability Approval of Electronic Component Technologies for Space Applications
No. 25400	Technology Flow Qualification of Electronic Components for Space Application

4.2 REFERENCE DOCUMENTS

ESCC 00000 Charter of the European Space Components Coordination

5 RESPONSIBILITIES

Each ESCC Organisational Body shall generate and use internal working procedures sufficient to implement those aspects of this ESCC Procedure for which they are responsible.

5.1 COMPONENTS TECHNOLOGY BOARD

The CTB shall:

- Prepare the ESCC Annual Qualification Programme (AQP).
- Identify the resources and commitment from amongst the participating organisations necessary for the implementation of each item to be included in the AQP.
- Monitor the implementation of the AQP and report progress and any problems to the SCSB.

5.2 SPACE COMPONENTS STEERING BOARD

The SCSB shall:

- Approve the Annual Qualification Programme.
- Monitor the overall progress of implementation of the AQP and the performance of responsible bodies.

5.3 EXECUTIVE

The Executive shall:

- Support the CTB in documenting the component qualification needs of the Participating Organisations and in preparing the proposed AQP.
- Implement the ESCC AQP and co-ordinate all activities related to the implementation of the AQP and the qualification and certification of EEE components, manufacturers and component technologies.
- Prepare periodic progress reports, including the reporting of any problems, to the CTB concerning the implementation of the AQP.
- Manage the qualification maintenance programmes.
- Supervise qualified component manufacturers and those under qualification.

5.4 EUROPEAN SPACE AGENCY

ESA shall:

- Undertake the responsibilities of the ESCC Certification Body.

5.5 MANUFACTURER

A Manufacturer, agreeing to participate in ESCC, shall in respect of his products:

- Support the formulation of the AQP.
- Cooperate in the practical implementation of the AQP as appropriate and conform to the rules, requirements and supervisory practices of the ESCC Qualification System.
- Report non-conformances to ESCC requirements in accordance with the requirements of ESCC 22800.
- Undertake to maintain the availability of ESCC qualified parts to the space market for an agreed period following certification.
- Undertake to inform the Executive in advance of a planned discontinuation of qualified parts and to provide for last time orders.

6 ANNUAL QUALIFICATION PROGRAMME

6.1 PLANNING PROCEDURE

6.1.1 CTB

The CTB shall draw up an AQP which sets out to provide for the timely availability of qualified parts meeting the declared needs of users. The CTB shall plan the AQP on a yearly basis so as to release the approved programme to the Executive, for implementation, at the end of the preceding calendar year. To achieve this, the CTB shall:

- Publish and disseminate a schedule for AQP planning based on the CTB meeting schedule and the supporting activities.
- Manage successive drafts of the AQP in a controlled manner.
- Identify from its overall strategic programme and work plans suitable candidate items for inclusion in the AQP.
- Take due note of the status of unqualified items listed in the EPPL with regard to their inclusion in the AQP.
- Take due note of parts approaching obsolescence and plan for replacement parts, as necessary, for inclusion in the AQP.
- Elicit additional inputs from the PSWG, the Executive and other appropriate organisations, external to the CTB, which utilise or provide ESCC components or otherwise contribute to ESCC activities.
- Identify the funding sources for the qualification of the proposed items.
- Identify the target timeframe to qualify the proposed items.
- Identify the proposed qualification methodology.
- Verify the component manufacturers eligibility.
- Verify the component manufacturers willingness to participate and to support subsequent procurements for an agreed minimum period.
- Identify the declared users (organisations/programmes) and predicted volumes and time scales.
- Identify target pricing for procurements.
- Prioritise the items in the AQP.
- Ensure that there is an underlying justification for the inclusion of items.

The CTB shall submit the final draft of the proposed AQP to the SCSB for approval.

6.1.2 Executive

The Executive shall:

- Support the CTB in the formulation of the AQP by advising on the availability of resources to manage the proposed programme.
- Provide advice to the CTB on the status of the existing AQP activities from previous years programmes as they influence proposed new items.

6.1.3 SCSB

The SCSB shall:

- Review the AQP submitted by the CTB, determine any changes required and formally approve the final programme.
- Instruct the CTB to deliver the approved programme to the Executive for implementation.

6.2 IMPLEMENTATION PROCEDURE

6.2.1 Executive

The Executive shall implement the AQP. To achieve this, the Executive shall:

- Prepare an allocation of resources against the planned programme utilising ESA and national space agency resources appropriately.
- Merge the current AQP with previous AQPs so as to be managed as a single qualification programme.
- Ensure each individual qualification programme item within the combined AQP retains the AQP year as part of its identification.
- Initiate new qualification items by taking the necessary contractual steps to agree and kick off the programme with the component manufacturer involved.
- Manage the qualification activity in accordance with the particular ESCC requirements for the qualification methodology to be applied (see Qualification, Capability Approval and Technology Flow procedures hereafter).
- Maintain an overview of the status of all running AQP items and report this to the CTB at regular intervals aligned to the CTB meeting schedule.
- Publish status information to the extent authorised by the PSWG in ESCIES (refer to ESCC Document 12200).
- Verify completed qualification activities.
- For successfully completed qualification activities submit a qualification application to ESA for review, approval and certification.
- Following ESA approval send the qualification certificate to the manufacturer and make the appropriate entry in the QPL or QML.

6.2.2 CTB

The CTB shall:

- Advise the Executive concerning issues arising from the AQP status reports.
- Provide guidance when problems occur or when changes in user needs impact the utility of running AQP items.

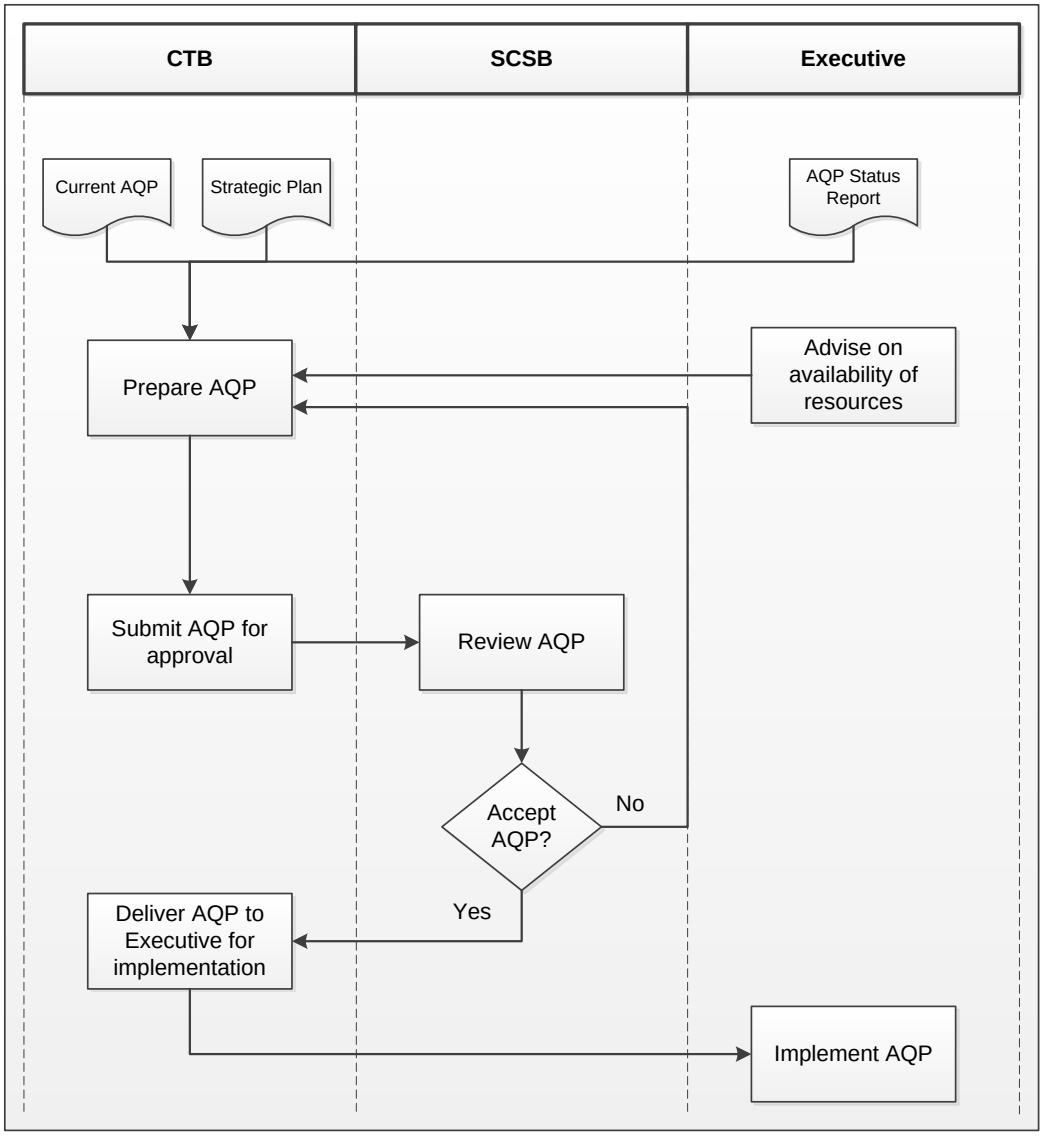
6.2.3 ESA

ESA shall:

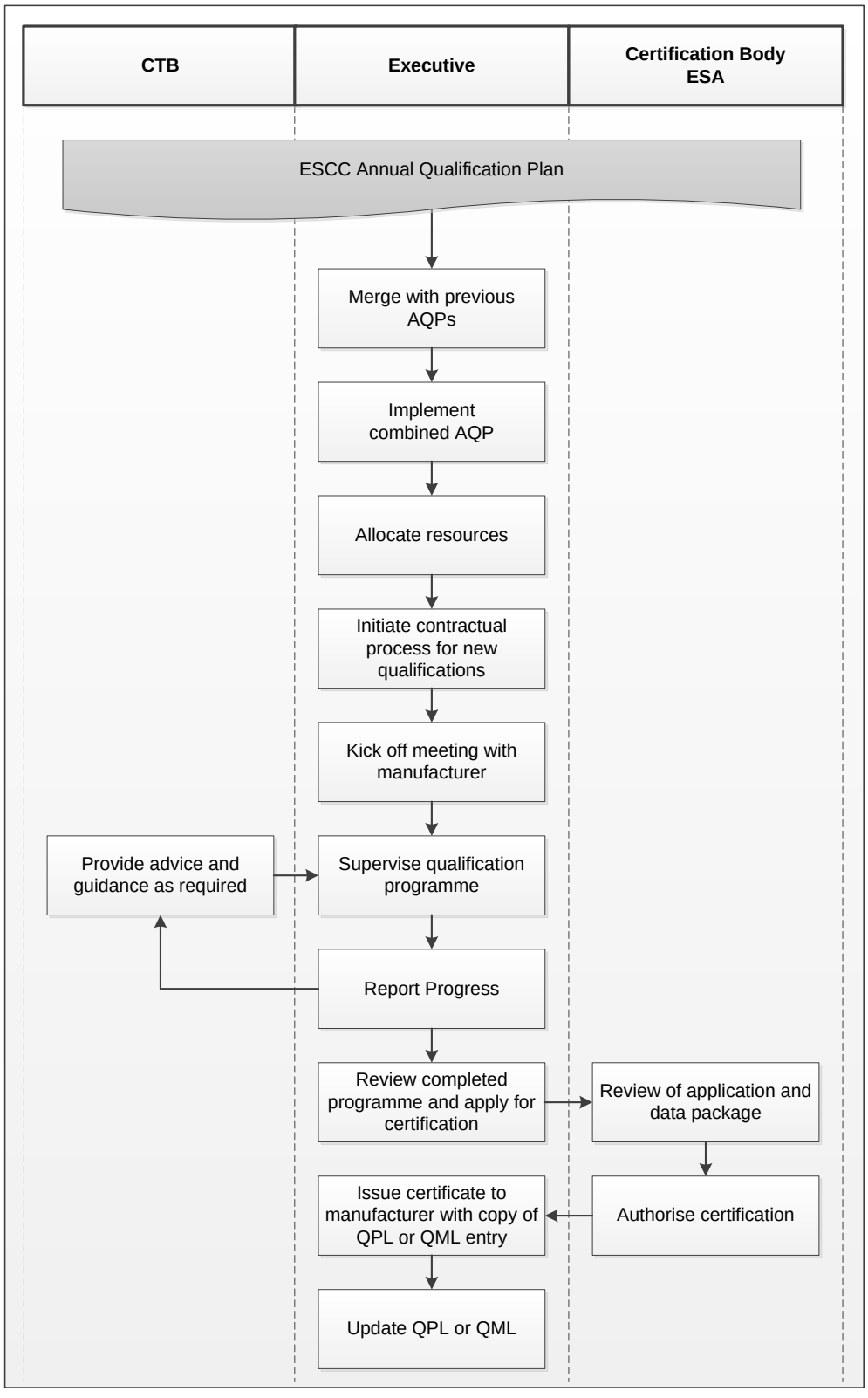
- Provide certification for those manufacturers that have successfully completed the required AQP qualification activities.
- Instruct the Executive to issue a certificate to the manufacturer and make the appropriate entry in the QPL or QML.
- Provide the ESCC Qualification Certificate and shall sign the certificate through the office of the Head of the Product Assurance and Safety Department.

6.3 AQP FLOWCHARTS

6.3.1 AQP Planning



6.3.2 Implementation



7 QUALIFICATION OF STANDARD ELECTRONIC COMPONENTS FOR SPACE APPLICATION

7.1 GENERAL

Qualification Approval is the ESCC quality assessment technique designed to certify that individual components, ranges of components or structurally similar components are of appropriate performance and reliability for use in space applications. The approach is applicable to components of standard design, as defined in ESCC Basic Specification No. 20100, which are in continuous or repetitive lot by lot production.

7.2 PROCEDURE

7.2.1 Executive

The Executive shall:

- Manage the qualification programme in accordance with ESCC Basic Specification No. 20100.

To achieve this, the Executive shall:

- Appoint a manager for the qualification programme to be the primary point of contact with the manufacturer.
- Perform an evaluation of the manufacturer in accordance with ESCC Basic Specification No. 20200.
- Appoint an audit team leader and audit team.
- Manage the audit, corrective action plan and associated audit closeout.
- Review existing data and agree an evaluation test programme with the manufacturer, if required, in accordance with ESCC Basic Specification No. 22600.
- Review and accept the Process Identification Document (PID) in accordance with ESCC Basic Specification No. 22700.
- Agree the Generic and Detail specification, managing any required changes through the appropriate ESCC procedures.
- Review the results of the evaluation and confirm their acceptance to the manufacturer.
- Commence the qualification testing programme.
- Process non-conformances in accordance with ESCC Basic Specification No. 22800.
- Review the qualification test report for acceptance.
- Verify the successful results of the qualification testing.
- Apply to ESA for certification.
- Report the successful outcome of the Qualification Approval to the CTB.
- List the qualification in the QPL.
- Subsequent to the Certification of the Manufacturer manage reported non-conformances affecting the validity of a qualification in accordance with ESCC 12102.
- Maintain and extend the validity of the qualification approval in accordance with ESCC Basic Specification No. 20100.

7.2.2 ESA

ESA shall:

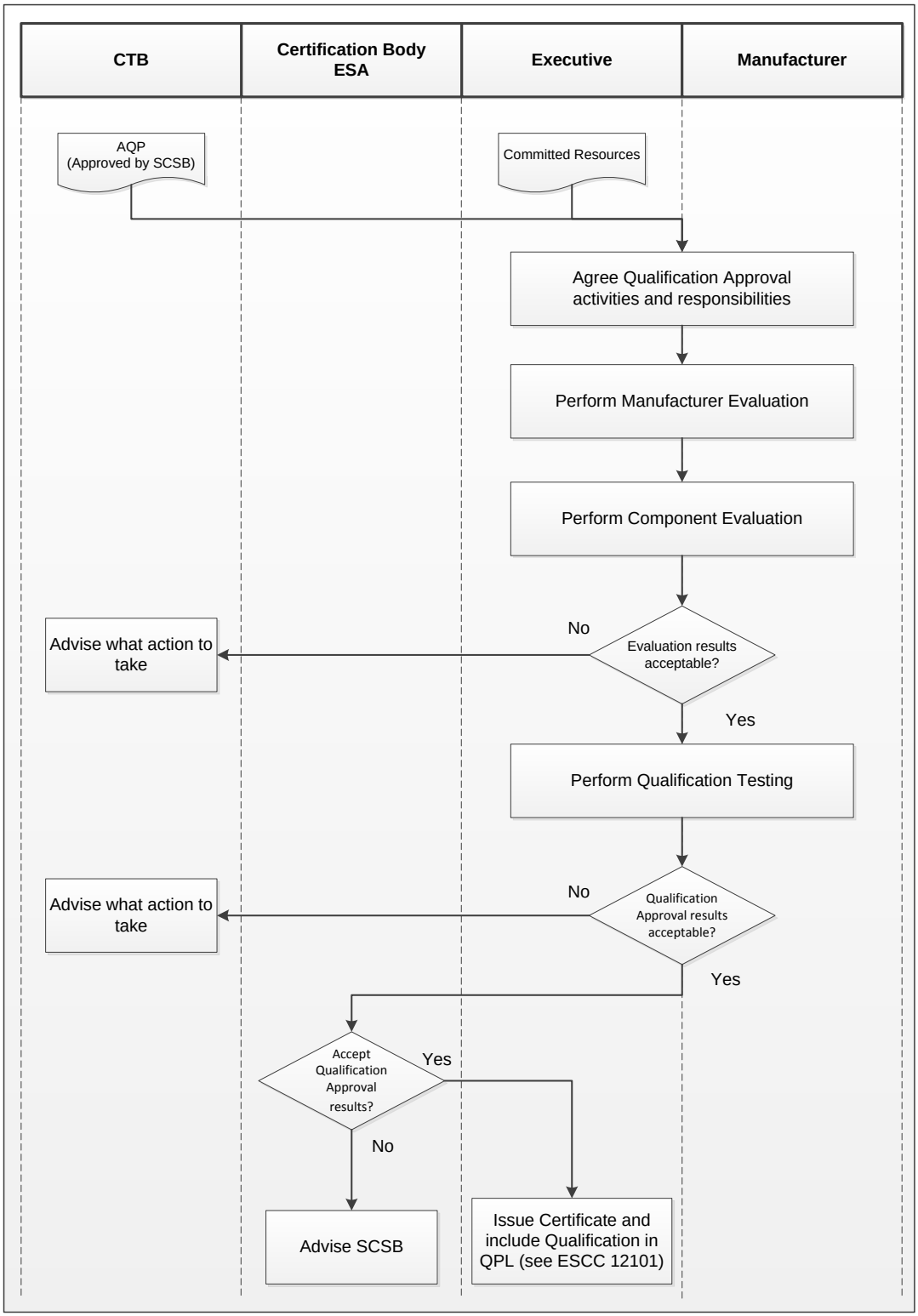
- Authorise the certification of manufacturers as recommended by the Executive.

7.2.3 Manufacturer

The Manufacturer shall:

- Apply for Qualification Approval in accordance with ESCC Basic Specification No. 20100.
- Conform to the requirements of ESCC Basic Specification No. 20100.

7.3 QUALIFICATION FLOWCHART



8 CAPABILITY APPROVAL OF ELECTRONIC COMPONENT TECHNOLOGIES FOR SPACE APPLICATION

8.1 GENERAL

Capability Approval is the ESCC quality assessment technique designed to certify that a manufacturing capability within a specified technology domain is of appropriate performance for use in space applications. The system is applicable to components manufactured in relatively small quantities for use in unique applications where manufacturers technology, materials and processes are used to fabricate components customised to specific user requirements.

8.2 PROCEDURE

8.2.1 Executive

The Executive shall:

- Manage the capability approval programme in accordance with ESCC Basic Specification No. 24300.

To achieve this, the Executive shall:

- Appoint a manager for the Capability Approval programme to be the primary point of contact with the manufacturer.
- Review and accept the Capability Approval Request and the associated data package.
- Perform an evaluation of the manufacturer in accordance with ESCC Basic Specification No. 20200 to additionally include the manufacturer's design facilities.
- Appoint an audit team leader and audit team.
- Manage the audit, corrective action plan and associated audit closeout.
- Review and accept the manufacturer's capability abstract.
- Review and accept the Process Identification Document (PID), including the definition of the test structures, in accordance with ESCC Basic Specification No. 22700.
- Review existing data and agree an evaluation test programme with the manufacturer.
- Examine and approve the schedule for the production and testing of components and test structures.
- Agree the Generic and Detail specification, managing any required changes through the appropriate ESCC procedures.
- Agree specifications for test structures not covered by an ESCC Detail specification.
- Review the results of the evaluation and confirm their acceptance to the manufacturer.
- Commence the Capability Approval Testing.
- Review and agree the test programme and manufacturing and testing schedule.
- Process non-conformances in accordance with ESCC Basic Specification No. 22800.
- Review the Capability Approval test programme report for acceptance.
- Verify the successful results of the Capability Approval Testing.
- Apply to ESA for certification.
- Report the successful outcome of the Capability Approval to the CTB.
- List the Capability Approval in the QPL.
- Subsequent to the Certification of the Manufacturer manage reported non-conformances affecting the validity of the capability Approval in accordance with ESCC 12102.

- Maintain and extend the validity of the Capability Approval in accordance with ESCC Basic Specifications No. 24300.

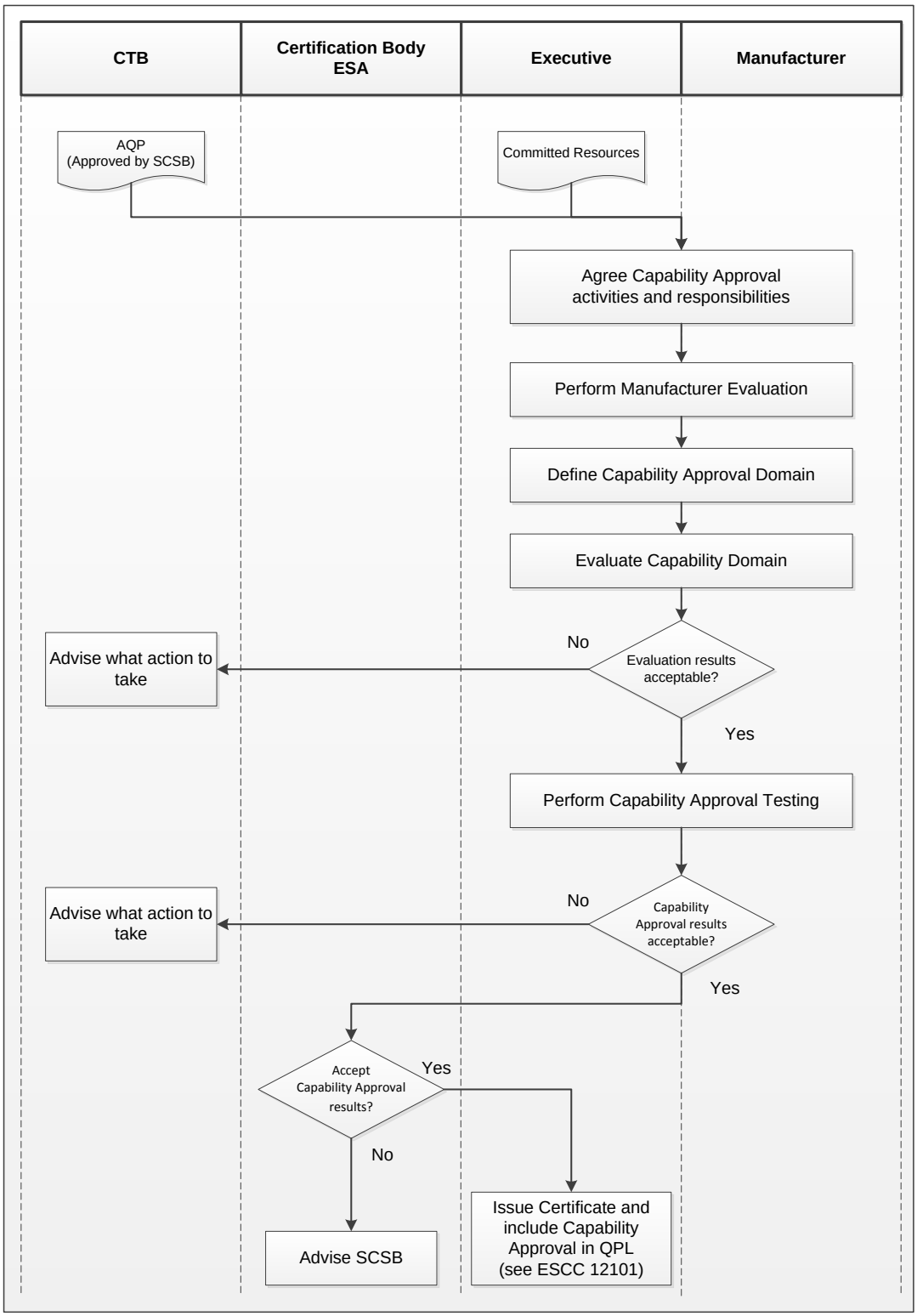
8.2.2 ESA
ESA shall:

- Authorise the certification of manufacturers as recommended by the Executive.

8.2.3 Manufacturer
The Manufacturer shall:

- Apply for Capability Approval in accordance with ESCC Basic Specification No. 24300.
- Conform to the requirements of ESCC Basic Specification No. 24300.

8.3 CAPABILITY APPROVAL FLOWCHART



9 TECHNOLOGY FLOW QUALIFICATION OF ELECTRONIC COMPONENTS FOR SPACE APPLICATION

9.1 GENERAL

Technology Flow Qualification is the ESCC quality assessment technique developed to ensure the reliability and performance of space components whilst maximising the benefits of the manufacturers' best practices.

The Technology Flow Qualification system is designed for component manufacturing technology flows that combine effective quality management techniques with stable and reliable technologies that are supported by quality improvement and Technical Review Board (TRB) principles. Technology Flow Qualification is suitable for both standard continuous lot by lot production components and non-standard components that have design features customised to specific user requirements.

9.2 PROCEDURES

9.2.1 Executive

The Executive shall:

- Manage the Technology Flow Qualification programme in accordance with ESCC Basic Specification No 25400.

To achieve this, the Executive shall:

- Appoint a manager for the Technology Flow Qualification programme to be the primary point of contact with the manufacturer.
- Assist the manufacturer concerning the Technology Flow and Certification requirements.
- Review the Technology Flow application for acceptance.
- Review the Technology Flow Evaluation Test Programme for acceptance.
- Review and accept Process Identification Document (PID) in accordance with ESCC Basic Specification No. 22700.
- Review the Pre-validation package for acceptance.
- Appoint an audit team leader and audit team.
- Determine if Pre-Audit visit is necessary.
- Perform an evaluation of the manufacturer in accordance with ESCC Basic Specification No. 20200.
- Manage the audit, corrective action plan and associated audit closeout.
- Review the results of the evaluation and confirm their acceptance to the manufacturer.
- Acknowledge Technology Flow Certification.
- Review Technology Flow Qualification Programme for acceptance.
- Process non-conformances in accordance with ESCC Basic Specification No. 22800.
- Provide surveillance during the Technology Flow Qualification Test Programme.
- Review Technology Flow Qualification report for acceptance.
- Verify the successful results of the Technology Flow Qualification testing.
- Apply to ESA for Technology Flow Certification and Qualification.
- List qualified technology and part types in the QML.
- Report the successful outcome of the Technology Flow Qualification to the CTB.

- Subsequent to the Certification of the Manufacturer manage reported non-conformances affecting the validity of a qualification in accordance with ESCC 12102.
- Maintain and extend the validity of the Technology Flow Qualification in accordance with ESCC Basic Specifications No. 25400.

9.2.2 ESA

ESA shall:

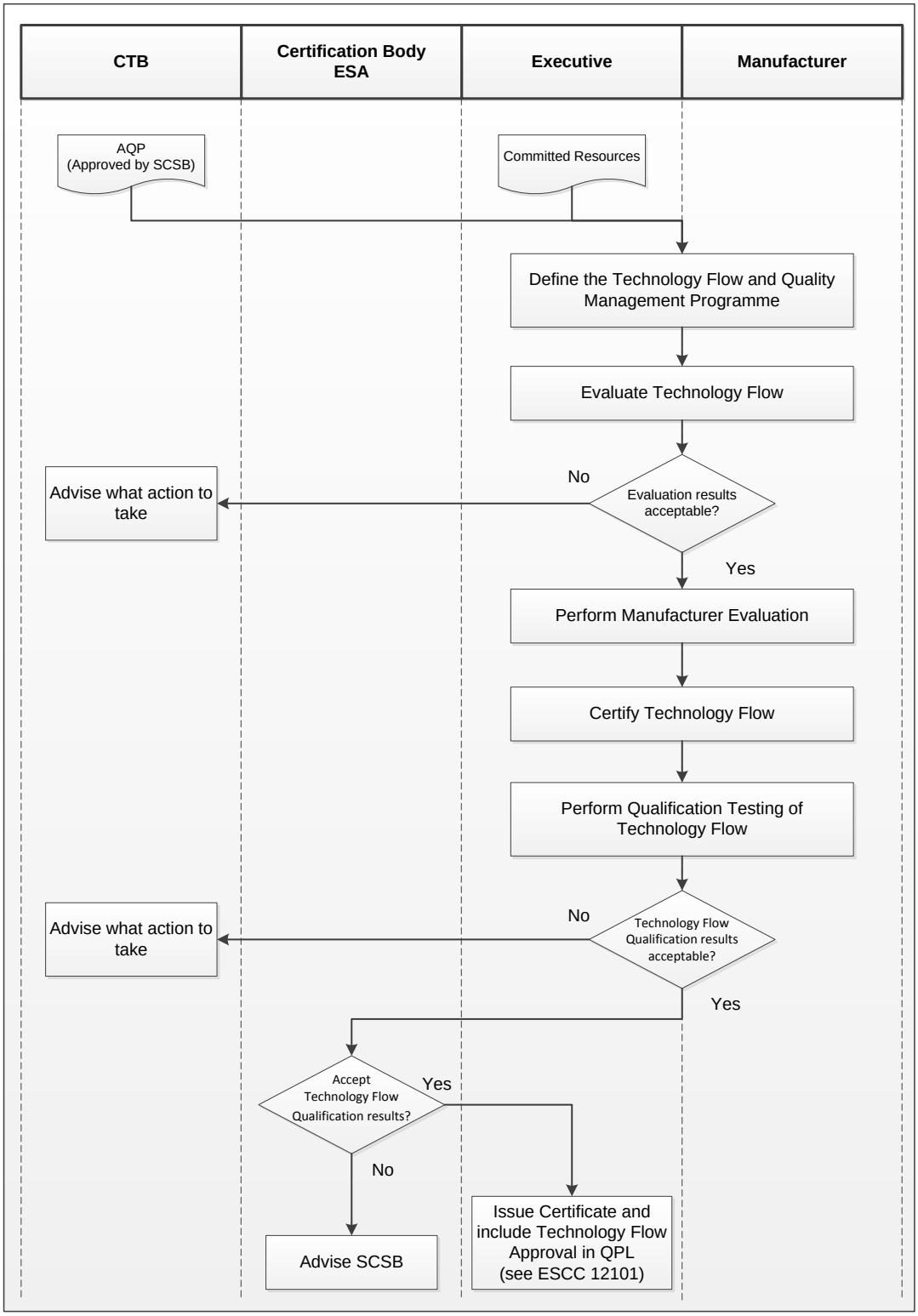
- Authorise the Certification of manufacturers as recommended by the Executive.

9.2.3 Manufacturer

The Manufacturer shall:

- Apply for Technology Flow Qualification in accordance with ESCC Basic Specification No. 25400.
- Conform to the requirements of ESCC Basic Specification No. 25400.

9.3 TECHNOLOGY FLOW QUALIFICATION FLOWCHART



10 RECORDS AND REPORTING

10.1 RECORDS

The following records shall be retained:

Record	Responsibility	Validity of the Qualification + Retention Period
Strategic Plan	CTB Chair/ESCC Secretariat	5 years
Annual Qualification Plan	CTB Chair/ESCC Secretariat	5 years
Qualification file	Executive	10 years
QPL	Executive	ongoing
QML	Executive	ongoing
AQP Status Report	Executive	5 years

10.1.1 Qualification File

For each qualification the Executive shall ensure that the following records are retained:

- Audit report, corrective action plan and audit closeout report.
- Test reports.
- Reference to or a controlled copy of the PID.
- Closed Non-conformances.
- Reports of the Executive review of qualification results.
- Correspondence.
- The application to ESA.

10.2 REPORTING

10.2.1 SCSB

The SCSB shall include in its annual report details of the implementation and progress of the AQP.

10.2.2 CTB

The CTB shall include in reports to the SCSB details of the progress of the AQP and any problems associated with its implementation.

10.2.3 Executive

The Executive shall prepare periodic AQP status reports to the CTB which shall be aligned to the CTB meeting cycle. The progress report shall also include any areas of concern, resource problems and significant non-conformances with ESCC requirements.