

# ESCC Past and future

by the Policy & Standard Working Group

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ESA ESTEC

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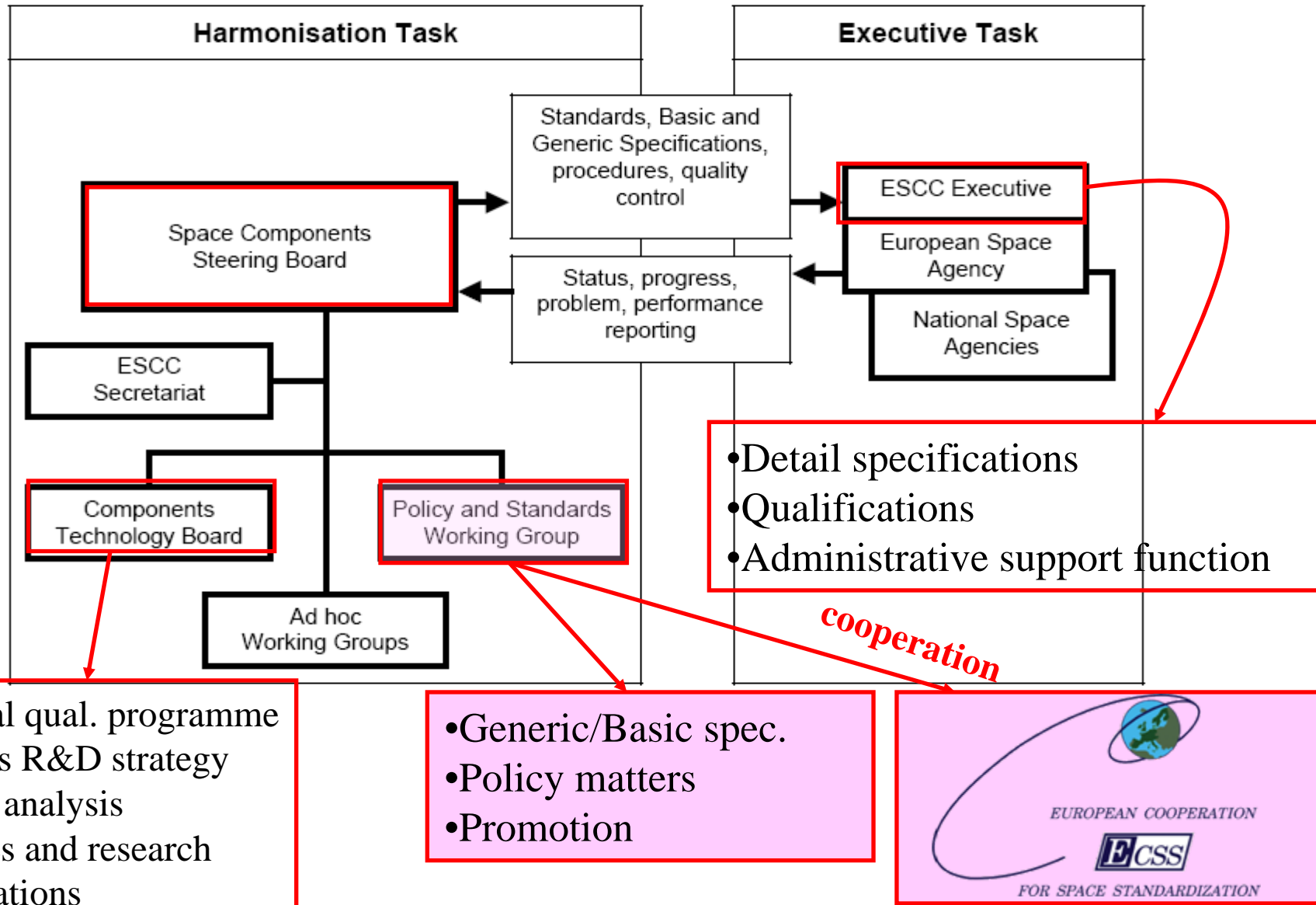
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# 1. Organisation (1/2)

- ESCC stands for **E**uropean **S**pace **C**omponents **C**oordination
- Membership : Agencies, Industry, manufacturers
- The ESCC System is applicable to **E**lectrical **E**lectronic **E**lectromechanical (EEE) Components
  - Electronic : ICs ( LSI, VLSI), transistors, diodes ...
  - Electrical : resistors, heaters, capacitors, connectors, cables, crystals, thermistors, fuses ...
  - Electromechanical : relays, switches ...
- ESCC = set of requirements to **evaluate**, **qualify**, **procure** (screening, lot test) European EEE components
- QPL = **Qualified** Parts List; QML = Qualified Manufacturers List
- EPPL = **European Preferred** Parts List includes European & non European parts, not only qualified ones
- 3 ways to qualify : component qualification, capability approval, technology flow qualification.

# 1. Organisation (2/2)



## 2. PSWG Mission

- Generic/Basic spec.
- Policy matters
- Promotion



**escies.org**  
european space components information exchange system

**EPPL** | *European Preferred Parts List*

*Issue: 17*

*Issue Date: 2010-12-15*

PSWG =

- ideas sharing and confrontations,
- actions & follow-up,
- directions choices,
- priorities definitions, arbitrations,
- approvals, decisions

cooperation



**Q-60 Discipline  
EEE Components**

(as of 09 February 2010)

### 3. Achievements (1/4): ESCC (1/2)

#### **ESCC specifications approval (change or new)**

Since 2002, through 75 Document Change Request among 150 generic & Basic spec:

#### Basic Specifications :

- QML implementation : ESCC25400 ; ESCC2544001
- Establish Reliability for resistors : 4001 ; 26000 (Failure Rate Level Sampling Plans and Procedures )
- Minimum Quality System Requirements : ESCC 24600
- Recommendations for the evaluation & procurement of non standard electronic parts : ESCC 23100 & ESCC 23500 (lead finish)
- Qualification : ESCC 20100
- Component Manufacturer Evaluation : ESCC 20200

#### Generic Specifications :

- CCD : ESCC 9020
- Integrated circuits , discrete : ESCC 9000, ESCC5000
- Resistors : 4009
- Crystal Resonator : ESCC3501
- Relays (Evaluation Test Plan, Screening)
- Switch /thermostat : ESCC 3702
- Coils : ESCC 3201

#### **ECSS-Q-ST-60C : calls up requirements from Application Notes in the NASA Parts Selection List for those US-MIL component types covered**

- Originally with the intend to provide guidance for users and based on an initial analysis performed by Astrium a sub-WG reviewed and dispositioned about 180 extracted requirements.
- This was completed in May 2010 and the results are published in ESCIES
- The resulting changes to ECSS-Q-ST-60C will be included in Rev. 2 currently in preparation

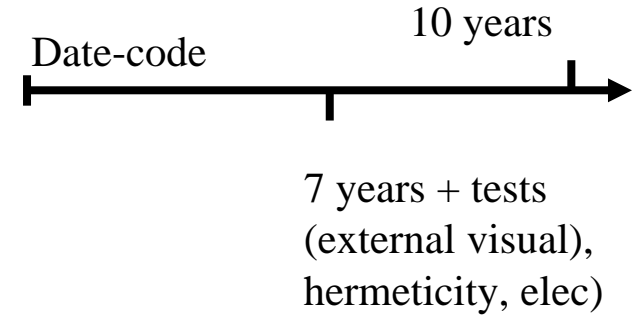


***NASA Electronic Parts and Packaging Program***

*Technology Information for Future NASA Missions*

- ECSS-Q-ST-60C : Requirements (see next slide)
  - ECSS-Q-ST-60-14 : Relifing
    - Storage & removal from storage
  - ECSS-Q-ST-60-02 : ASICS/FPGA
    - ASIC and FPGA development
  - ECSS-Q-ST-60-05 : Hybrids
    - Generic procurement requirements for hybrids
  - ECSS-Q-ST-60-12 : MMIC
    - Design, selection, procurement and use of die form monolithic microwave integrated circuits (MMICs)
  - *No direct PSWG role for :*
    - *ECSS-Q-ST-30-11 /derating,*
    - *ECSS-Q-HB-30-12 /end of life parameters ESCC Spec*
- Date-code

7 years  
(external  
hermeticity)





### 3. Achievements (4/4) : ECSS (2/2)

- **Pre-tailoring included** : 3 classes of requirements (assurance/risk trade-off)
- Typical requirements (non exhaustive)
  - Declared Components List
  - Parts/material restriction
  - Preferred sources
  - Parts Approval
  - Evaluation
  - Screening / Quality levels
  - Lot test
  - Final Customer Source Inspection
  - Incoming Inspection
  - Radiation
  - Destructive Physical Analysis
  - Relifing
  - Handling/ storage
  - Traceability
  - Alerts
  - Hybrids
  - Microwave monolithic integrated circuits
  - One time programmable devices





## 4. Challenge

- Manufacturers trends :
  - offshore subcontracting, non integrated, fabless, fablight, dispersed, word wild, pan European
- New technologies / products : Non monolithic / non simple / non single parts :
  - Opto cable+ connector , Oscillators, Laser diodes,  $\mu$ p + capa, MultiChip modules, etc.
- Test method : Radiation (TID, DD SEE, etc.) Policy : requirements update (evaluation, test method)

### ESCC specifications

- Pure tin / Lead free Incoming test :
  - Should take benefit of existing standards
- Non Pure tin requirements :
  - ESCC specifications consolidations : checking of the exhaustiveness of the requirements through the whole ESCC system
  - Will be managed via DCRs
- ESCC capability approval for hybrids
- Oscillators : Generic spec
- Laser diodes (specific WG)
  - Evaluation test Plan + Generic spec
- Optical connectors (specific WG)
  - Synergy with the ECI 2 activity (Manufacturer Diamond / AVIM connectors)
  - Basic, Generic, 2 detail specs
- Assembly & Test House : certification

### ECSS :

- ECSS-Q-ST-60-13 (COTS)
  - Kick-off done : 07/12/2010, Final draft 12/2011  
**(The schedule is really a challenge,)**
  - Limited perimeter : monolithic active parts
  - Pre-tailoring as per ECSS-Q-ST-60C
  - Order of preference : Space Qualified parts
- ECSS-Q-ST-60-15 / Radiation Hardness Assurance, final draft to be provided by WG in April 2011 to PSWG and ECSS Secretariat for preparation of public review.

### **ESCC promotion :**

- Availability of Manufacturers ESCC qualification data on ESCIES
- ESCC QPL : improve the management of the end of validity dates
- Training courses : Second session 22-23/03/2011
- Better visibility of the ESCC QML versus ESCC QPL
- For the projects Parts Management , Declared Components Tool : put in place a single form sheet/tool (standardization, 3<sup>E</sup> lists compilation, etc.)

## 6. Conclusion

- Since 2003, the PSWG is a balanced, operational European working group, which practically contributes to the ESCC health, stability, development & improvement.
- Policy decisions have to consider :
  - Technical concerns and new technologies insertion
  - ESCC organisation, rules and consistency
  - The economic situation
- The activity work plan considers :
  - Need
  - Maturity
  - Reasonable feasibility