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ESCC Executive Public Notice (EPPN-2022-1 Issue 1)

Subject: Counterfeit risk awareness due to global shortage of EEE & PCB

To: European Space Community

As a consequence of the global shortage of EEE & PCB there is a growing risk of counterfeit components entering the space market.

This ESCC Executive Public Notice shall raise the awareness of users, when procuring EEE and PCB parts. This increased risk applies for any quality level (class 1, 2 and 3 and COTs).

Reference documents:

ECSS-Q-ST-60C Electrical, electronic and electromechanical (EEE) components

ECSS-Q-ST-10-09C Non-conformance control system

SAE AS 5553 C Counterfeit Electronic Parts; Avoidance, Detection, Mitigation, and Disposition

Reminder on ECSS requirements:

As per ECSS-Q-ST-60C, it is required to buy parts only directly from manufacturer or from a franchised distributor (that includes CPPAs and EEE procurement agencies), please refer to the requirements as given in Para. 4.3.1 (5.3.1 and 6.3.1 respectively):

>>To reduce the risk of procuring counterfeit components, when parts are not directly procured from the manufacturer, the supplier shall procure parts only from distributors duly franchised by the parts manufacturer.<<

Risks description:

Reasons for a higher risk of counterfeit parts:

- Even before the global supply chain crisis there was a risk of counterfeit parts for space programs, however the risk was manageable and low as soon as the ECSS-Q-ST-60C procurement rules are applied.
- Due to the global shortage the users are now under higher schedule pressure and are forced to look for other possibilities as their direct manufacturers or franchised distributors are not able to meet their regular and expected delivery times
- The risk of bypassing the requirements is therefore increased.
- The global crisis provides more opportunities for non-franchised distributors and brokers to enter new market segments with the associated risk of selling counterfeit parts (without CoC, lack of traceability of supply chain, etc.)
- Increased use of COTS devices and new suppliers entering new space market.
- Etc.

It can be very difficult to detect counterfeit parts. Some examples of counterfeit parts showed the following:

- difference in markings or packages, however you need some comparison with the original parts from the manufacturer
- absence of die or bond wires detected with electrical testing or Construction Analysis
- incorrect wire bonding or incorrect die detected with electrical testing or construction analysis
- bad quality of wire bonding detected by detailed inspections



- hidden performance and reliability weaknesses detected by intensive electrical and thermo-mechanical analysis and/or screening and life testing
- Etc.

Risks mitigation:

In the case of procurement of parts not in line with the ECSS-Q-60 requirements, approval from any affected project shall be obtained. The supplier shall perform a lot validation during the incoming inspection and compare the results with original parts from the manufacturer. SAE AS-5553 can be used as a reference. The Lot validation shall include:

- Analysis of Certificate of Conformity from the manufacturer.
- Checking of packaging and labels.
- 100% external visual inspection.
- 100% electrical test.
- DPA (adequate sample number).

This list is not exhaustive and can vary from case to case. Further testing might be decided depending on risk, device type and technology like for example: construction analysis, solderability, temperature testing or cycling, lifetest, etc...

In case of Hirel part procurement, an intense documentation check shall be performed.

Therefore it is essential to follow the requirement as given in ECSS-Q-ST-60C.

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In cases where the requirement listed above is not fulfilled a major NCR must be raised and the concerned parts must not be installed before the NCR is approved and closed according to the requirement for NCR and RFW from ECSS-Q-ST-10-09. The NCR shall document all the performed activities to prove that the parts are not counterfeit.

Please address any feedback or comments to this Notice to escs-executive.secretariat@esa.int

Best Regards,

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