ESA recent challenges in space missions: Cracked capacitors' time bomb and forbidden solderless connectors

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This presentation will address two EEE parts related topics:

1. ESA's recent in-orbit failure of Copernicus Sentinel S1b mission, with a main suspected root cause related toexcessive stress applied during the assembly process of ceramic type II capacitors.

   Sentinel-1B Synthetic Aperture Radar (SAR) payload malfunctioned end of 2021 and consequently ended the spacecraft'smission more than six years after its launch! Failure investigations showed that the solderingprocess used to mount thecapacitors is the most probable root cause. Detailed failure mechanism and lessons-learned will be presented.

2. On-going development challenge of a high density backplane PCB connectors compatible with Compact PCI SerialSpace (cPCI SS) for High Data Rate space applications.

   The adoption of cPCI SS Architecture for ESA Advanced Data Handling Architecture (ADHA) units represents aconsiderable challenge for the development of solderless connectorsbased on innovative technologies (i.e. press-fit forspace, S-FECT, etc.), since currently only one commercial grade solution exists, with a potential damage on PCB and noreliability/evaluation data. The current developments will be explained.