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A Burn-in test station for the ATLAS Phase-II Tile-calorimeter low-voltage power supply transformer-coupled buck converters

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The upgrade of the ATLAS hadronic tile-calorimeter (TileCal) Low-Voltage Power Supply (LVPS) falls under the high-luminosity LHC upgrade project. This presentation serves to provide a detailed overview of the development of a Burn-in test station for use on an upgraded LVPS component known as a Brick. These Bricks are radiation hard transformer-coupled buck converters that function to step-down bulk 200 V DC power to the 10 V DC required by the on-detector electronics. To ensure the reliability of the Bricks, once installed within TileCal, a Burn-in test station has been designed and built. The Burn-in station functions to implement a Burn-in procedure on eight Bricks simultaneously. The Burn-in procedure subjects the Bricks to sub-optimal operating conditions which function to stimulate failure mechanisms within the Bricks. This results in components that would fail prematurely within TileCal failing within the Burn-in station thereby allowing for their replacement which subsequently improves the reliability of the Brick population. The Burn-in station is of a fully custom design in both its hardware and software. The development of the test station will be explored in detail with the presentation culminating in a discussion of preliminary Burn-in results.

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