Safe to Fly: Certifying COTS Hardware for Spaceflight

Abstract

Providing hardware for the astronauts to use on board the Space Shuttle or International Space Station (ISS) involves a certification process that entails evaluating hardware safety, weighing risks, providing mitigation, and verifying requirements. Upon completion of this certification process, the hardware is deemed "safe to fly." This process from start to finish can be completed as quickly as 1 week or can take several years in length depending on the complexity of the hardware and whether the item is a unique custom design. One area of cost and schedule savings that NASA implements is buying Commercial Off the Shelf (COTS) hardware and certifying it for human spaceflight as "safe to fly." By utilizing commercial hardware, NASA saves time not having to develop, design and build the hardware from scratch, as well as a timesaving in the certification process. By utilizing COTS hardware, the current detailed certification process can be simplified which results in schedule savings. Cost savings is another important benefit of flying COTS hardware. Procuring COTS hardware for space use can be more economical than custom building the hardware. This paper will investigate the cost savings associated with certifying COTS hardware to NASA's standards rather than performing a custom build.