

1C - Commercial Use of Spaceport Technologies

Self-Healing Wire Insulation and Repair – Technology Opportunity

NASA is developing innovative methods to repair damaged wire insulation that can lead to self-healing systems. The wire insulation used in the Space Shuttle is either Kapton™ (a polyimide) or Teflon™ (a polyfluorocarbon). Similar to other critical applications in the aircraft and nuclear industry, wire inspection and repair is important in keeping these systems safe. Existing insulation repair methods use similar repair materials, and either: (1) wrap the damaged area with mystic tape and secure the ends with tie-wraps; or (2) melt a fluorocarbon polymer over the damaged area with a heat gun. These methods result in poor adhesion to the damaged insulation and can cause breaks at each end of the repair. NASA's new repair methods for Kapton™ synthesize a polyimide on the surface of the damaged insulation, producing an excellent seal with very high adhesive forces. Current developments and future plans will be presented. In addition to using this technology on the Space Shuttle, NASA has been awarded funding from the Federal Aviation Administration's aging aircraft group and is seeking partners to co-develop and commercialize self-healing insulation repair.