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NISAR INTEGRATED TESTING OF THE NASA ISRO SYNTHETIC APERTURE RADAR

Abstract

NASA's most expensive Synthetic Aperture Radar – NISAR is under test in California and preparing to move to Bangalore for final integration with ISRO. Never before has there been a program of this magnitude between India and America. While laying a foundation for peace and cooperation during troubling times NISAR sets a shining example for how collaboration and testing of a multi-billion dollar mission occurred during a pandemic. The testing techniques and methodology behind these herculean efforts will be discussed in detail from build-up of the spacecraft to its upcoming launch. NISAR is a complex system which consists of a massive deployable 12 meter reflector, hybrid Indian and American science suites and a highly advanced bus made solely by India. By recording and detailing the integration and test campaign we will also take a closer look at the design where permissible to facilitate future missions with ISRO for the world. Everything required for a complex test campaign with India through launch is discussed here for the benefit of future customers looking to understand what it is like to do business with ISRO or be hosted on an ISRO platform. Lastly, some of the unique fault conditions that were detected during integrated testing will be analyzed and their solutions presented. The techniques leverages the testing techniques of two great space faring nations resulting in unique solutions as well as collaborative friendships. A quick look at the projected integration with the GSLV coupled is presented as this is the first NASA launch from this indigenous Indian launch system. In conclusion, the NISAR mission is a world first. Building a complex spacecraft with India in this way was a unique challenge and the lessons learned are essential to discuss so that teams in the future might leverage their wisdom.