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SOFTWARE ENGINEERING STANDARDS AND SATELLITE DEVELOPMENT– THE INDIAN SPACE RESEARCH SCENARIO

Abstract

ISRO Satellite Centre (ISAC) of the Indian Space Research Organization develops satellites for a variety of earth observation, communication, navigation and scientific applications . These satellites consists of highly complex software intensive systems which carryout variety of highly advanced mission functions .As a result , software has become a critical element for mission success. Realizing the importance of establishing and following best practices for software development , way back in the early 90s ISRO brought out its Software Engineering Standard ISES 92 (ISRO Software Engineering Standard) which has been rigorously followed till 2008 not only in ISAC but also in all the centers of ISRO. The standard played a vital role in the development of highly reliable software in both space and ground segments.

However in the year 2008, when India entered the international market for satellite technology development , compliance with international standards became essential and ISRO decided to follow IEEE12207 software standard for all its software activities . Since the reliability requirements of software varies for systems on board and those for launch support and mission operations , the process rigor for different categories of software were identified and the standard adapted accordingly. Yet another area is software for safety critical systems for the Indian Navigation System Satellites and Human Space programs , which need safety certification . DO178-B software safety standard will be rigorously followed for such missions.

This paper after introducing the proven merits of adopting Software Engineering standards for reliable software development, describes how smoothly ISAC migrated to new standards from time to time without affecting on going processes and upsetting launch schedules . It is evident that since a good quality system and a well organised quality planning process exists , any future challenges can be met . This is very much relevant in the wake of India planning many ambitious planetary and interplanetary mission for the future.