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SYSTEM ENGINEERING METHODS AND PRACTICE FOR AEROSPACE SOFTWARE
DEVELOPMENT

Abstract

This article introduces the methods for aerospace software development and management in the new era, based on the experience of software engineering implementation in China's "Chang'e II" project. Software in modern spacecrafts are generally large scale and complex with high quality requirement. On the other hand, the managerial, technical and environmental factors affecting software development have changed a lot. Therefore, the aerospace software development and management should not only comply with the basic software engineering rules, but also take corresponding measures according to the system engineering ideas and methods, to solve the tricky and complex problems in this special area. The article first analyzes the requirements and features of the aerospace software development for the new period. Then, it presents the up-to-date system engineering methods for software development, to strengthen the system-level planning and management and to combine generality and practicality. On the technical side, we highlight top-level software designing and integrating new technology applications, and improving the coverage of software system test. On the managerial side, we emphasize top-down planning and independent third-party software validation test, the integration of software engineering management of the project and of the process capability of the organization, and the operability and examinability of the software engineering specifications. Finally, the article illustrates the application of the proposed methods in the "Chang'e II" project. This article builds on the Chinese experience and developing ideas on aerospace software engineering. It will provide references for the space software engineering research and applications across the globe.