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Author: Mr. Fang Zhu
China Aerospace Science and Technology Corporation (CASC), China, phys.zhufang@gmail.com

PRODUCT READINESS LEVELS (PRLS) – NEW TOOLS FOR CUSTOMERS AND MANUFACTURERS TO REACH A CONSENSUS ABOUT QUALITY AND RISKS OF SPACE PRODUCTS

Abstract

In recent years, the concepts and approach of Technology Readiness Levels (TRLs) and Manufacturing Readiness Levels (MRLs) have been applied in countries' defense acquisitions, especially in the field of aerospace. Obviously, these methods can be used to evaluate the difficulty of research transferring to production. They have played significant roles on controlling technology and manufacturing risks.

The two methods above, however, could provide assistant for technology planning only, but hard to support Quality Management (QM) and Quality Evaluation (QE) through products development circles. For QM and QE of space products, Product Readiness levels (PRLs) are needed in aerospace projects. Meanwhile, PRLs can extend the objects of readiness assessments from technology to products. In this paper, the concepts of PRLs are defined, while Product Readiness Assessments (PRAs) are provided either.

PRLs are defined to eight levels based on Chinese space general product development phases. PRAs cover risk points of product development process, relate to three main areas – product design, manufacturing and application. The PRLs and PRAs can be used to evaluate the risks of space products before project milestones. Furthermore, a consensus of space product quality would be reached between customers and manufacturers.

PRLs and PRAs provide a basic input of quality evaluation for complex aerospace system consisting multi-product, and act as effective tools for customers to have acquaintance with aerospace projects risks, then plan investments. In China, PRLs and PRAs have been promoted in the field of aerospace, and applied in the construction of BeiDou(COMPASS) Navigation Satellite System and other space projects yet.

Keywords: Space Products; Product Readiness Levels; Quality Management; Risk Identification