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### 可靠性系统工程的理论与技术框架

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### Framework of Theory and Technique about Reliability System Engineering

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摘要

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**摘要** 简要回顾了可靠性系统工程的形成过程,以产品故障为核心,阐述了可靠性系统的概念与定义,把认识产品故障发生规律和故障表现规律作为可靠性系统工程基础理论,把故障预防技术、故障控制技术和故障修复技术作为可靠性系统工程的基础技术,把基础技术的集成作为可靠性系统工程的应用技术,从而初步建立了可靠性系统工程的理论与技术框架,细化了可靠性系统的学科内涵。可靠性系统工程作为初现的新学科,虽然尚未达到严格定义与清晰表达的完善状态,但是我们完全有信心期待其作为一种新的方法论,帮助工程设计人员更好地完成工程系统的设计。

**关键词:** 可靠性系统工程 故障 学科 理论与技术框架

**Abstract:** This paper introduce a emerging discipline about failure and fault of system, named reliability system engineering, review the evolution in China since the idea emerged in 1991, give a definition of reliability system engineering and have a deep discussion about the theoretics and methodology in reliability system engineering. The framework about this discipline include three levels, the first level is basic law about failure mechanism, the second level is a set of basic techniques to prevent, control and repair failure/fault of system, the third level is the integration of basic law and basic techniques for engineering application. Finally, a brief perspectives on this emerging discipline is proposed. Reliability engineering is emerging as an important discipline for engineers of systems, but it did not simply appear, well-formed and clearly articulated, as a new concern for systems. Rather, it has emerged over time as a natural evolution of design abstraction, as engineers have searched for better ways to understand their systems and new ways to build more reliable systems.

**Keywords:** reliability systems engineering failure and fault discipline framework of theory and technique

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