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基于RSMTL-CAD框架的FMECA软件设计

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DESIGN OF FMECA SOFTWARE BASED ON RSMTL-CAD FRAMEWORK

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摘要

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摘要 分析了当前工程实际对计算机辅助 FMECA(故障模式影响及危害性分析)软件的要求,描述了基于RSMTL(可靠性、安全性、维修性、测试性、保障性)-CAD框架的 FMECA软件的主要功能和体系结构,并讨论了软件设计过程中的 2个关键问题:1通过对 FMECA数据特点的分析,利用面向对象思想建立了一种灵活开放的数据模型。这种数据模型利用层次关系和属性集合,描述了 FMECA结果数据中的 4种关系:FMEA结果和 CA结果之间的依存关系;上下级产品故障模式因果逻辑关系;同一产品在不同初始约定层次设置下的数据组织关系;版本关系。2在数据关系的映射中,利用等价关系的方法解决了各软件工具之间数据引用关系的表达问题。该软件以 Client/Server机制运行,支持网络化和多用户并行使用

关键词: 可靠性 计算机辅助设计 FMECA 数据模型

Abstract: Firstly, the requirement to Computer Aided Failure Mode, Effects and Criticality Analysis (FMECA) software is analyzed. Then main functions and architecture of the FMECA software based on Reliability, Safety, Maintainability, Testability, Logistics (RSMTL)-CAD Framework are described. Two issues in the development process of the software are discussed. 1) After analyzing interrelation of FMECA results, a flexible and open data model based on Object Oriented Method is presented. Through using the hierarchy and property set, the model describes four relations of FMECA result data, that is, the dependency of various FMECA results, causality of the failure modes of products from different indenture levels, organization of FMECA results at different analysis initial indenture levels of the same product and the version management of FMECA result. 2) Equivalence Relation is used to describe the reference relations among the tools of RSMTL-CAD. The software runs in Client/Server mode and can be operated in networks and multi-user environments.

Keywords: reliability computer aided design FM ECA data modeling

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