

ASIGURAREA CALITĂȚII – QUALITY ASSURANCE

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The Role of Quality in Manufacturing: From Cure through Prevention to Damage Limitation

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Abstract

The purpose of this paper is to explore new approaches in the practice of quality management, beyond the existing and well-documented quality approaches of cure and prevention. In-depth case studies at three European automotive manufacturers and their suppliers have shown that a new generation of complicated quality problems has emerged. These problems are neither preventable nor curable at an acceptable cost because their basis is more emotional than technical. It is concluded that traditional expertise in matters technical are no longer sufficient for success. It has become essential to develop skills in the less structured areas of understanding and managing customer relationships.

Keywords: quality, manufacturing, quality management, quality problems, automotive industry

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Random Fuzzy Continuous-Time Markov Jump Processes

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Abstract

Continuous-time Markov chains are an important subclass in stochastic processes, which have facilitated many applications in business decisions, investment risk analysis, insurance policy making and reliability modeling. One should be fully aware that the existing continuous-time Markov chains theory is merely a framework under which the random uncertainty governs the phenomena. However, the real world phenomena often reveal a reality in which randomness and vagueness co-exist, and thus probabilistic continuous-time Markov chains modeling practices may be not wholly adequate. In this paper, we define random fuzzy continuous-time Markov chains, explore the related average chance distributions, and propose a scheme for parameter estimation scheme. It is expected that a foundational base can be established for reliability modeling and risk analysis, particularly, repairable system modeling.

Keywords: Credibility measure, credibilistic fuzzy variable, random fuzzy variable, average chance distribution, random fuzzy Markov jump process, reliability modeling.

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Reliability Estimation using Degradation Tests

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Abstract

The paper presents the degradation tests used to evaluate the reliability of systems subjected to soft failures (performance drift). The failure is observed when the performance, which lowers during time, reaches an unacceptable level. This evolution is measured during the degradation tests. For the analysis of the results of degradation tests, we present the method by regression, the method of the invertible path and the method of the Wiener process. An application on the process of batteries discharge is used to illustrate the implementation of these three methods.

Keywords: Reliability, Failure, Degradation process, Degradation testing.

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A Reliability Model for Safety System-Protected Object Complex with Time Redundancy

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Abstract

In this paper an advanced safety system-protected object complex reliability model has been proposed, assuming time redundancy caused by protected object inertia. We also take into consideration scheduled periodic inspections of the safety system. The model can be used to obtain two-sided estimates of such reliability indices as mean time to failure and probability of failure prior to time t .

Keywords: Reliability, safety system, protected object, time redundancy.

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On Reliability Analysis of Highly Reliable Items

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Abstract

In recent years the intensive efforts in developing and producing electronic devices have more and more critical inference in many areas of human activity. Engineering is one of the areas which have been also importantly affected. The paper deals with dependability namely reliability analysis procedure of a highly reliable item. The data on manufacturing and operating of a few hundred thousands pieces of electronic item are available and they are statistically a very important collection/set. However, concerning some items the manufacturing procedure was not checked and controlled accurately. The procedure described in the paper is based on the thorough data analysis aiming at the operating and manufacturing of these electronic elements. The results indicate some behaviour differences between correctly and incorrectly made elements. It was proved by the analysis that dependability and safety of these elements was affected to a certain degree. Although there is a quite big set of data the issue regarding the statistical comparability is very important.

Keywords: Reliability, dependability, procedure, risk analysis, risk priority, criticality matrix failure, field data, electronic production.

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Photovoltaics: Novel Technologies. Reliability

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Abstract

In recent years the photovoltaics (PV) market has been growing at a rapid pace due to various factors related to the environment and economy. Three novel PV technologies (inorganic materials, organic materials, and crosscutting science and hybrid materials) appeared. Recent breakthroughs indicate that useful phenomena, such as carrier multiplication, can occur efficiently in certain nano-structured materials, offering an opportunity to enhance the efficiency of photovoltaic devices. This paper analyses these new technologies as well as some of the related reliability aspects.

Keywords: Solar cells, novel PV technologies, amorphous hydrogenated silicon (a-Si:H) thin film, reliability, GaInP/GaAs, GaInP/GaAs/Ge, Cu(InGa)Se₂ and CdTe cell efficiencies.

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