

Researches Concerning the Resiliency of Socio-Technical Systems

Abstract

This paper presents the interdisciplinary research developed at the EUROQUALROM laboratory and based on the SOREZ – „Socio-technical systems resilient to errors / fault“ project; these researches have as purpose to improve the dependability and especially of its main components – reliability and safety/security – of socio-technical systems, mainly through the use of errors/fault tolerance.

For high functional importance systems (especially the electronic/information, nuclear, aeronautic and military ones) the failures may have important social-economic consequences. That's why, for these systems must adopted, beginning with the design stage, structures/strategies to avoid dangerous states.

An important research direction having as goal the reliability growth for high functional importance systems is the use of fault tolerance, an architectural attribute of a system which makes possible its operation, even in the presence of one or several faults in its structure. Certainly, in the context of critical socio-technical systems it is necessary to extend the researches to the error tolerant systems. A peculiar attention is given in the international researches to the human factor in complex systems. DHE (Designing for Human Error) became during the last period a large used method for the designers of high functional importance systems critical from the point of view of security or missions.

The researches regarding human factors intensified during the last two decades, based on the statistics that demonstrate the human failure are responsible for 25...40% of the failures of complex systems. A special attention is given to the methods for human reliability/safety analysis, having as objective the identification of the criticality of human actions, determination of the corresponding probabilities, minimization of the dependence among human actions etc. Some researches take into consideration development of interfaces between systems which limit the error risk. It is important for these interfaces to be adapted to the characteristics and limits of human operators.

The researches done in the frame of this grant take in consideration a quantitative evaluation related to human error/reliability as well as a deep study of the interaction technical-human in the dependability evaluation of high functional importance socio-technical systems.

To conclude, the interdisciplinary researches that been developed in the frame of this grant had as main objective the improvement of the dependability of socio-technical systems, which have a technical component, as well as a human one.

Keywords: *Resilience, research, socio-technical system, dependability, human reliability, human error.*