

Abstract

Electric power is of increasing importance in all domains. As a consequence, static converters have become widespread, and power electronics is crucial for improving performance, reliability and competitiveness. Indeed, almost all the systems use static inverters to treat electrical energy. For this, we developed a global methodology allowing to model and to evaluate reliability, crucial factor of the reliability, is controlled relatively little in the development of the systems. It is a tool of decision-making aid by developing the qualitative and quantitative evaluation of reliability. Initially we present the concepts and the methods of the reliability; a comparison of these various methods is presented. Thus, measurements and the laws associated with reliability will be discussed. Then the study of the defect in the cell of commutation is carried out by applying two methods of analysis (FTA and FMECA). For better analysis of reliability, we introduced new methods of modeling such as the binary trees of decision, and this while starting of the logical formula interpreting the corresponding tree of failure