

# The Software Complex Development for Modeling and Optimizing of Processes of Radio-engineering Equipment Quality Providing at the Stage of Manufacture

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**Abstract** – The results of software complex development for modeling and optimizing of processes of radio-engineering equipment quality providing at the stage of manufacture are presented.

**Keywords** – software complex OPTAN, radio-engineering equipment quality providing at the stage of manufacture.

## INTRODUCTION

At the Lviv Polytechnic National University under the scientific guidance of professor Nedostup L. A. the work under scientific principles and methodology of radio-engineering equipment quality providing at all stages of its life cycle, including the stage of manufacture is maintained. The continuation of this work is an appropriate software development, the initial version of which is known as interactive automated system OPTAN [1]. This system is greatly improved and organized as a universal program and methodical complex, which is designed to solve following tasks:

- the construction of structural, formalized and mathematical production processes models, suitable for comprehensive researches of technological processes (TP) of REE mass production;
- the analysis of standard (basic) TP options after the estimation of system control effectiveness;
- TP optimization by optimizing control procedures over the quality and reliability criteria of REA, including the formation of the optimal requirements for control operations, the list of controlled parameters, selection of appropriate test equipment etc.

The result of solving these problems is the optimal (efficient) variant of TP organization by control procedures optimizing, which provides an appropriate level of REE quality and reliability with given (admissible) values of the technical and economic indicators.

## THE STRUCTURE AND PRINCIPLES OF SOFTWARE

### COMPLEX DEVELOPMENT

The software complex is built with the use of modular approach, which provides filling the complex with functionally-oriented modules within a single information and software support.

This enabled a versatile and convenient software creation, without restrictions on the complexity of the analyzed TP. It is important that the modular approach allows the complement of the complex with new modules without changing its structure. This makes it possible to increase the functionality of the complex in general, modify the list of solved problems, and more.

The structure of the complex contains three information and software-related fields of basic modules – the field of computational modules, designed to implement appropriate calculating procedures; the field of optimization module, designed to implement the appropriate optimization method; the field of support and service modules, designed for dialog mode. Basic modules, in their turn, are used to form working modules, each of which is intended to implement appropriate system tasks, formed by system task manager. The complex is supplemented with a universal database and library of TP analyzed models.

## CONCLUSIONS

1. The proposed version of the software and methodical complex is suitable for solving tasks of modeling, analyze and optimization of real processes of REE manufacturing. The complex was tested on typical TP examples of printed circuit boards manufacturing with different technologies, integrated circuits manufacturing, universal oscilloscopes, and other products. Test results generally confirmed the accuracy of the results and the efficiency of the complex.

2. The results of TP optimization reveal the possibility of TP management by the optimal (rational) TP structure selection, optimal control system organization, an appropriate catalogue of technological and testing equipment, education, which generally provides the most efficient use of all material and technical resources.

## LITERATURE

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