INNOVATION IN COMPLEX SYSTEMS USING VALUE ANALYSIS AND TRIZ

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Abstract: *This paper presents the application of a new methodology, called AVTRIZ for redesigning a complex system of curved profiles and pipes production. AVTRIZ methodology was developed by combining Value Analysis and Engineering with TRIZ method. The dual approach in the technic and management domains there were established several innovative solutions based on technological forecast, which led to lower manufacturing costs and increased flexibility of the system.*

Keywords: *Value Analysis, TRIZ, AVTRIZ, Design*

1. Introduction

Established initially for the technical field, in the recent years, TRIZ method has been continuously developed and adapted for being used in other non-technical fields. One of the domains that witnessed the rising interest in adapting and developing TRIZ method are business and management. On the other hand, there is a keen interest in combining TRIZ method with other methods, to obtain powerful tools for product development in general, for innovation, technological forecast etc. In this sense, we can mention: TRIZ and QFD that allow for innovative solutions to resolve contradictions between the "how"s at the top of the quality “house”; TRIZ and Taguchi methods that are applied for permanent monitoring of the parameters optimisation process; as well as the TRIZ and FMEA combined methods, etc.

There were not so many attempts made in the professional literature to address the combination of TRIZ with the Value Analysis and Engineering method, which can also be a very powerful tool in (re-)designing various systems. In this sense, the author has developed her own methodology, called AVTRIZ [2], which can be applied at product level, technology system, at the level of the manufacturing system and the production system. This is part of a wider methodology of innovation and forecast, being one of its seven major stages.

So far, the AVTRIZ methodology has only been customized, adapted and validated at the level of the technological system, by its application to a cutting technological system and to a complex system of machining by cold deformation of complex profiles and pipes. The latter makes the subject of this paper which focuses on several details regarding its application for the innovative redesign of the system. In the future it is envisaged to provide this methodology customization and implementation at the level of the manufacturing and production systems of both the AVTRIZ sub- methodology and the general methodology of innovation and forecast, in which it is embedded as one particular stage.

2. The content and structure of AVTRIZ Methodology

AVTRIZ methodology created and published [2] by the author includes 3 steps, 8 stages and 30 phases.

Step I named analysis of current system status is one specific for the application of the Value Analysis and Engineering (VAE) [4] and it comprises three stages: 1. Preparation (topic selection, team appointment, methodology