

## Improvement of the Reliability and the Availability of a Production System

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**Abstract :** Aims of the work: The aim of this paper is to improve the reliability and the availability of a Packer production line of cigarettes based on two methods: The SADT method (Structured Analysis Design Technique) and the FMECA approach (Failure Mode Effects and Critically Analysis). The first method enables us to describe the functionality of the Packer production line of cigarettes and the second method enables us to establish an FMECA analysis. Methods: The methodology adopted in order to contribute to the improvement of the reliability and the availability of a Packer production line of cigarettes has been proposed in this paper, and it is based on the use of Structured Analysis Design Technique (SADT) and Failure mode, effects, and criticality analysis (FMECA) methods. This methodology consists of using a diagnosis of the existing of all of the equipment of a production line of a factory in order to determine the most critical machine. In fact, we use, on the one hand, a functional analysis based on the SADT method of the production line and on the other hand, a diagnosis and classification of mechanical and electrical failures of the line production by their criticality analysis based on the FMECA approach. Results: Based on the methodology adopted in this paper, the results are the creation and the launch of a preventive maintenance plan. They contain the different elements of a Packer production line of cigarettes; the list of the intervention preventive activities and their period of realization. Conclusion: The diagnosis of the existing state helped us to found that the machine of cigarettes used in the Packer production line of cigarettes is the most critical machine in the factory. Then this enables us in the one hand, to describe the functionality of the production line of cigarettes by SADT method and on the other hand, to study the FMECA machine in order to improve the availability and the performance of this machine.

**Keywords :** production system, diagnosis, SADT method, FMECA method

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