

RISK MANAGEMENT AND MULTICRITERIA OPTIMIZATION OF PRODUCTION PROGRAM

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Abstract: The paper presents the integration of risk management methodology and multicriterial optimization of production program. The aim of the research is development an integrated risk management model and multicriterial optimization of production program that will enable reduction of risk of operating losses and increase efficiency of enterprise management in the production program selection. Research results indicate that the decision makers in using an integrated model for an optimal production program, rated the model as a significant support in decision making process, shortening decision making time and increase the quality of decisions as it is based on quantitative indicators and not on subjective evaluation.

1. INTRODUCTION

In modern business conditions, an application of multicriterial optimization of production program concept is a very important support in managing an enterprise. Multicriterial optimization of production program involves the determination of such production program whose product range, volume and dynamic elaboration per quarterly will generate the maximum income, precisely, rational material, human and mechanical resource allocation.

Multicriterial optimization of production program is based on the optimality criterion, which can be linear or nonlinear functions: maximum profit, minimum costs, maximum production capacity utilization, maximum human resource utilization, minimum use of material resources, etc. Multicriterial optimization of production program is become essential in modern business conditions, bearing in mind that market conditions are such that each irrational management leads to uncompetitiveness.

Therefore, in the modern business conditions is necessary developing of management production program model, where it is necessary to minimize the risk of operating losses.

The risk, in general, is product of the probability of certain adverse event occurrence and the impact that this event can generate. In business of enterprises, there are several categories of risk: risk of equipment failure (estimated in relation to human safety, to environment, to business losses, etc.), risk management as a security measure, financial risk assessment in cases of loan approval, quality management risk, etc.

In risk management, there are strategic risk, operational risk, financial risk and risk acceptance. Strategic risk refers to all

aspects related to competition, market position and economic conditions. Operational risk refers to the daily operations, precisely, to the consequences of daily decisions made in the company. The financial risks are related to relations with banks and stockholders, etc., while risk acceptance means the fulfillment of legal regulations relating to safety, environmental protection and so on.

The steps in applying risk-based approach are:

- Risk identification - what can affect the implementation of production program.
- Risk analysis - defining the probability of occurrence of that.
- Risk assessment - determining the consequences, expressed in the form of operating losses.

Enterprise Risk Management Committee 2003 [1] presented useful way to conceptualize ERM along two dimensions: types of risk and process steps, table 1.

Table 1. Overview of Enterprise Risk Management [1]

Process Steps	ERM Framework			
	Types of Risk			
	Hazard	Financial	Operational	Strategic
Establish Context				
Identify Risks				
Analyze/Quantify Risks				
Integrate Risks				
Assess/Prioritize Risks				
Treat/Exploit Risks				
Monitor & Review				

Hazard risk include risks form:

- fire and other property damage,
- windstorm and other natural perils,