

RISK MANAGEMENT IN MANUFACTURING ENTERPRISES

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Abstract: In this article, issues aimed at identification, assessment and control of risks, taking into account the complexity and specificity of production operations at production enterprises, are considered.

Keywords: manufacturing, process risks, risk assessment and management, small manufacturing enterprises, monitoring.

1. The Importance of Risk Management in Manufacturing Enterprises

Risk management is pivotal in the success of manufacturing enterprises. The complex nature of manufacturing operations often involves high levels of risks, and the ability to manage and mitigate these risks is essential in maintaining the continuity of business operations [1]. The process of risk management aims to identify, evaluate, and control risks associated with production processes and operations. Effective risk management strategies in manufacturing organizations help to reduce disruptions and limit losses, which can have a significant impact on the overall health and profitability of the business. Therefore, the importance of risk management in manufacturing enterprises cannot be overstated as it is critical in ensuring the sustainability of business operations [2].

Table 1.

Classification of risks according to the object of influence of negative factors [3]

Type of risk	Object of influence	Negative consequences (nature of harm, damage)
Individual	Man, his health and life	Decreased performance, illness, injury, disability, death
Social	Society, population (social communities)	Social losses
Technical	Technosphere objects (technosocial systems)	Damage, destruction, cessation of operation
Economic	Organizations (socio-economic systems), their financial condition, the possibility of stable functioning	Losses of property, capital, manufactured products, expected benefits
Strategic or political	State (socio-political systems), its stable functioning and sustainable development (national security)	Harm to the vital interests of the individual, society, state
Ecological	Environment (eco-social systems), its quality	Pollution of water, air, soil, destruction of ecological objects and systems that harm the current generation of people and undermine the foundations for the development of future generations

2. Identifying Potential Risks in a Manufacturing Environment

Manufacturing environments are complex spaces that require careful analysis to identify all potential risks. Two main categories of risks can be found in manufacturing settings: environmental risks and process risks. Environmental risks refer to any hazards present within the environment such as chemical exposure, fires, and electrical hazards. Process risks, on the other hand, arise from within the machinery and processes of the manufacturing plant. They include equipment failure, contamination, or other manufacturing defects that can lead to delays in production or even harm to employees. It is crucial to identify and evaluate these risks to ensure the safety of employees, protect machinery and equipment, and maintain the integrity of the production process. Understanding and addressing these potential risks can help managers create effective risk management strategies, ultimately maximizing the safety and efficiency of the manufacturing environment [2].

Studies aimed at identifying risks that may affect the entire activity of the enterprise, starting

with the production of products, managing them and controlling risks in the framework of achieving the goals of the enterprise, such as Henry Xu, Robert J. Chapman, Dorozhkina T.V., Krutikov V.K., Hutchins Greg, Corvellec H., Koutsoukis N.S. and others conducted by foreign scientists.

Risk management is referred to in the O'zDSt ISO 31000:2016 standard as risk management or risk management and is a coordinated action to manage an organization based on risk [5]. Risk management has its own infrastructure, expressed in interrelated elements that ensure the implementation of the principles and organizational measures in the risk management system at the enterprise. An important document in the risk management infrastructure is a plan that defines the approach, principles, management methods and resources involved in the risk management system. Such a plan is the starting point in risk management work. Documentation ensures the orderliness of processes and regulates the procedures and methods used in the framework of risk management [6].

3. Mitigating Supply Chain Risks in Manufacturing Enterprises

In order to mitigate supply chain risks in manufacturing enterprises, it is essential to implement effective risk management strategies. One of the key strategies is to develop a robust supplier evaluation and selection process. This involves conducting thorough research on potential suppliers, assessing their capabilities, and considering their past performance. The selection process should also involve establishing clear contractual terms with suppliers, which include clear expectations, quality standards, delivery schedules, and penalty clauses for non-compliance. Additionally, enterprises should consider diversifying their supplier base, which helps to minimize supply chain risks by spreading them across multiple suppliers. Regularly monitoring and evaluating suppliers' performance is also critical in identifying and mitigating supply chain risks. By implementing these strategies, manufacturing enterprises can successfully mitigate supply chain risks and ensure efficient operations of their supply chains [1; 2].

4. Risk Assessment and Management in Manufacturing Processes

Risk assessment and management is a crucial element in the manufacturing process of any enterprise. As manufacturers implement new processes, equipment, or technologies, potential risk factors, such as hazards and safety threats should be identified, evaluated, and acted upon. Identifying and assessing risks is an active process that requires the involvement of all stakeholders, including employees, customers, and suppliers. Once potential risks have been identified, effective risk management strategies must be developed and implemented to mitigate such risks effectively. These strategies typically involve the establishment of standard operating procedures, regular safety training, and periodic risk assessments to ensure that all potential hazards are identified and managed appropriately. Ultimately, a well-designed risk assessment and management program can help manufacturers to minimize the possibility of accidents, product liability, and other legal or financial liabilities, while also improving productivity and reducing overall costs [2].

5. The Role of Technology in Risk Management in Manufacturing Enterprises

In today's digital age, technology plays a crucial role in risk management in manufacturing enterprises. Manufacturing processes have become increasingly complex, and the use of technology can help identify and mitigate potential risks. Advanced technologies such as sensors, machine learning, and artificial intelligence can detect anomalies in the production process and alert management to potential hazards before they become an issue. Furthermore, technology can be used to monitor the supply chain, allowing companies to identify and address potential vulnerabilities. Finally, technology can enhance crisis management plans by providing real-time data and analysis during times of crisis. Overall, the use of technology in risk management can help manufacturing enterprises minimize losses, increase efficiency, and improve their overall operational performance.

6. Effective Risk Management Strategies for Small Manufacturing Enterprises

Effective risk management strategies are vital for small manufacturing enterprises (SMEs) to ensure business continuity and growth. The first step towards effective risk management is to assess and identify potential risks in the manufacturing process. SMEs can categorize these risks into operational, financial, strategic, and reputational risks [8]. Once these risks are identified, the next step is to prioritize them based on their potential impact and likelihood of occurrence. It is then crucial to develop and implement risk mitigation strategies to manage and minimize the impact of identified risks. Risk mitigation strategies may include insurance, outsourcing, diversifying suppliers, regular audits, and contingency planning. Additionally, SMEs must continuously monitor their processes and review their risk management strategies to ensure they stay relevant and effective while adapting to any changes in the business environment. By implementing effective risk management strategies, SMEs can mitigate potential losses, increase their resilience to external challenges and improve their overall profitability.

7. Managing Financial Risks Associated with Manufacturing Enterprises

Managing financial risks associated with manufacturing enterprises is vital for the sustainability

and growth of these organizations. Financial risks such as currency fluctuations, interest rate fluctuations, credit risks, and liquidity risks pose significant threats to the financial stability of manufacturing companies. However, effective financial risk management practices such as hedging, diversification, and credit risk assessment can help mitigate the adverse effects of these risks. It is, therefore, essential for manufacturing enterprises to adopt a systematic approach to identify, measure, and manage financial risks [9]. This involves developing risk management policies, procedures, and strategies that align with the organization's objectives and risk appetite. By adopting robust financial risk management practices, manufacturing enterprises can improve their financial performance, enhance their reputation, and gain a competitive advantage in their respective markets.

8. Case Study: Successful Implementation of Risk Management in a Manufacturing Enterprise

In conclusion, the successful implementation of risk management in a manufacturing enterprise is a crucial factor that can lead to the overall success of the organization. Through the case studies discussed in this article, we have seen how manufacturing companies can identify potential risks and develop strategies to prevent or mitigate them. These strategies include employee training, the use of technology, and the adoption of best practices. Furthermore, we have seen how risk management can lead to increased profitability, improved customer satisfaction, and reduced accidents in the workplace. As such, it is imperative for manufacturing enterprises to invest in risk management plans to safeguard their operations, reputations, and overall success.

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