

International Conference
on Industrial Engineering and Systems Management

IESM' 2009

May 13 - 15, 2009

MONTREAL - CANADA

Proposition of a framework for managing the supply chain risks—application to the mining industry in Chile^{*}

C. DI MARTINELLY^a, N. BRONFMAN^a, E. ALARCON^b

^a *Universidad Andres Bello, Santiago, Chile*

^b *HATCH Ingenieros Consultores LTDA, Chile*

Abstract: Mining projects are worth billions of US dollars, are unique and involve an important amount of risks throughout the different steps of the supply chain. Because those hazards can have disastrous consequences, there is the need to propose solutions to counteract their effects. However, measures to offset the effects of uncertainties in the supply chain have often resulted in a decrease in the performance of the enterprise. The objective of this paper is to propose a framework to identify the risks that are threatening the achievement of the strategic objectives and provide the manager with performance indicators defined in accordance with the value and strategy of the firm. The impact on the strategy of the solutions to counteract the risks can thus be evaluated before their implementation.

Key words: Supply chain management, risk management, modelling, mining industry

1 Introduction

Mining projects generally involve billions of US dollars throughout the different stages, from the evaluation study, to the design and to the mine operating itself. One important characteristic of the mining enterprise is that the company's assets will be consumed during the production process. The continuing globalization of the mining industry, accelerated by the rapid growth in regions like China and Eastern Europe, has been increasing both demand and competition. This increased demand and strong commodity prices mean that improving productivity is essential, while at the same time needing to control costs to maximize margins and maintain an effective cost profile for the future. In that challenging environment, the supply chain (SC) is a key factor to enhance efficiency and return on investment. However, the globalization of the mining activities has also put more pressure on the supply chain and sharpens the risks along it. The numerous chain links are prone to breakdowns, disruptions or disasters. The results of those contingencies can be fatal for a business activity and disastrous for the economy of a country as Chile, where the mining industry generates 13 percent of the GDP. There is therefore a need to identify, evaluate and manage the risks in the mining SC.

Measures to counteract the effects of uncertainties in the SC have though often resulted in a decrease in the performance of the enterprise. Our idea is thus to propose different solutions to deal with the risks in the SC and to assess these solutions before their implementation on basis of performance indicators defined in accordance with the value and strategy of the firm. The decision makers are then provided with a scorecard comparing the current situation to the different options. In this paper, we will focus on the

^{*} This paper was not presented at any other revue. Corresponding author C. DI MARTINELLY. Tel. +5626618456. Fax +5626618623
Email addresses: cdimartinelly@unab.cl.