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RELIABILITY ENGINEERING: RISK MANAGEMENT IN SEAPORTS OPERATIONS

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ABSTRACT

This paper describes a project to mitigate risks in seaport operations and container terminals using bow tie methodology. Port and terminal projects and operations are exposed to a complex and changing range of risks. An evolving, and often unique, risk profile requires a balanced strategy to address risk mitigation. Such a strategy would include risk through the use of traditional insurance policies, together with innovative solutions tailored to the specific requirements of the client.

Keywords: risk management, bow tie method, seaport operations, container terminal.

INTRODUCTION

Often, risk management is seen as reactive, even worse, nonresponsive. This is a mistaken view. The risk management systems that have been conceived since the beginning of the 1990s, regardless of the stamp, the structure, the hue, the school - whether Dutch, American, English, Canadian, Italian, Australian, Indian, Latin American, Brazilian, all have a common trait: to work with methodologies and methods proactive and structured in relation to threats and opportunities, having as a fulcrum a clear understanding of the powerful nature of the systemic, qualitative and quantitative approaches to risk management.

This instrument seeks to facilitate the internal communication of companies through the use of a common language and a consistent system of management, promoting the achievement of the main objectives of Risk Management, among which: making risk management an integral part of the Container Terminal business; Support the management of the terminal owner in the rendering of accounts of its action before society and the local community; Strengthen the ethical base, credibility and image of the organization and, lastly, minimize risks, capital and operating costs, labor and environmental liabilities.

METHODOLOGY

The bow-tie method [1] provides a readily-understood visualization of the relationships between the causes of business upsets, the escalation of such events, the controls preventing the event from occurring and the preparedness measures in place to limit the business impact. Bow-ties originated as a method for assessing hazards and operational risks, although the exact origins of the methodology are a little hazy. The earliest mention appears to be in an Imperial Chemical Industries training course from 1979. Undoubtedly, the Royal Dutch/Shell

Group was the first major company to fully integrate the bow-tie method into its business practices and is credited with developing the technique which is widely used today. The primary motivation was to seek assurance that fit-for-purpose risk controls were consistently in place throughout all operations worldwide. Use of bow-ties has subsequently spread between companies, industries, countries and from industry to regulator, and their application has been extended to embrace all risks, for example financial, strategic, security, quality, business interruption, political, human resources, design and project risks. The possibilities are endless. The method for building a bow-tie diagram involves asking a structured set of questions in a logical sequence to build up the diagram step by step. The completed bow-tie diagram illustrates the hazard, its causes and consequences, and the controls to minimize the risk.

RESULTS AND CONCLUSIONS

The overall expected results for this study case (project) are the following:

- Container terminal risk to residual
- Develop actions in the design process that will bring the state of the art container terminal at the residual level.
- Greater Operational Availability
- Avoiding operational stops at the risk of generating unwanted events.
- Minimizing consequences through the development of Recovery Plans and Scenario response Plans
- New recipes / New loads
- Creating new skills in the operation of special / specific loads and today not operated
- Hazard and hazard mapping for potential or already operated loads
- Reduction Costs
- Developing business opportunities based on the new state of the art of residual risk
- Reduction of insurance
- Commitment to Sustainability
- Analysis, identification, treatment of risks associated with the environment and local community
- Best Image and Preserved Image
- Avoiding undesirable events that would cause image damage.
- Communicating community-based efforts to control operational risks.

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REFERENCES

- [1]-Lewis, Steve and Hurst, Sheryl “Bow Tie, An Elegant Solution?” Strategic Risk Magazine, 2005.
- [2]-Najib, M., Boukachoura, J. Fazziki, A: Multi Agent Framework For Risk Management In Container Terminal: Suspect Containers Targeting, 2013.
- [3]-Bellamy, L., Ale B., Hale, A, Oh, J.,:Storybuilder—A tool for the analysis of accident reports, 2007.
- [4]-Guide For Risk Evaluations For The Classification Of Marine-Related Facilities, June 2003, American Bureau of Shipping.