Chapter 6: Risk Management System – A Conceptual Model

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6.1 Introduction

This chapter deals with the topic of risk management concerning the transportation of dangerous goods. The evidence presented derives from a European project – the DaGoB (Safe and Reliable Transport Chains of Dangerous Goods in the Baltic Sea Region) project,1 as well as the author’s own research in the field. One of the main objectives of the DaGoB project is to enhance and transfer the knowledge in the field at local, national, regional and international levels.

The literature study shows that risk management is an evolving discipline of science. For a long time, risk assessment and management have been everyday human activities. However, in recent years, this simple perception of risk has changed considerably. Risk management has become a very important topic and a field of study in its own right. In many countries, it has become an increasingly important component of industrial and national decision-making processes concerning many issues including those related to human safety and health, environmental quality, property protection and security (IMO 1997, 2004, 2006; EC 1997, 2006). Contemporary risk management is a cross-disciplinary process that takes a holistic approach and employs a wide range of specific methods, techniques and tools. The process relies on the knowledge of many disciplines of science. However, despite the progress being made, the literature shows that there are still misconceptions, misuse and ambiguities in the field. In addition, as a result of accidents, there is growing public concern about the lack of safety and the

1 The DaGoB project is partly financed by the European Union (European Regional Development Fund) within the BSR INTERREG III B Neighborhood Programme. The project involved numbers of partners from the countries of the BSR, such as Finland, Germany, Sweden and the Baltic States. For more information see: www.dagob.info
consequent pollution caused by the transport of dangerous cargoes. In recent years, in particular after the “9/11” events, security concerning the chemical supply chain has become an important issue for many organisations, industries, governmental authorities and the general public. Such concerns stem mainly from the high and increasing volume of dangerous goods being transported, the potential for deliberate acts, the severe consequences of accidents, and the general belief that risks should be better managed. Therefore, there is a need to further enhance understanding of the field of risk management.

Given the importance, the relevance and the demonstrable need, also reflected in the objectives of the DaGoB project, the chapter seeks to provide a unified understanding of the risk management field in the context of the transportation of dangerous goods. The extensive literature review supplemented by personal research experience (Mullai and Paulsson 2002; Mullai 2004, 2006, 2007) provided the underpinning for the description of the central concepts. The content of this chapter is aimed primarily at risk analysts, risk managers and other members of the scientific communities and practitioners who are interested in risk-related issues, methodologies, research and management practices.

The constituent elements of the risk management system are defined and described in the context of the dangerous goods or the chemical supply chain, focusing in particular on the maritime transport of packaged dangerous goods (PDG). Given the representativeness of the chemical supply chain, the content of this chapter is relevant to many other supply chains or systems. Many industries, sectors or business activities are related to the chemical supply chain. Many risk-related terms, definitions, concepts, methodologies and practices have originally been developed by or on behalf of the actors in the chemical supply chain, including the oil and gas (inland and offshore) industries, the chemical production industry, chemical storage and transportation, the nuclear power production industry and many other related industries and relevant organisations. Some of the world’s best risk assessment and management practices, frameworks and techniques may be found in the chemical industry and related organisations. Such practices are adapted and implemented in other industries, sectors or businesses across many countries around the world.

The chapter begins with definitions of the central concepts, namely risk analysis, assessment and management. Then, a unified concept of the risk management system is provided. The main phases, stages and steps presented in the model are explored in some detail.

6.2 Variations in Terms and Definitions

The field of risk management is faced with difficulties in defining and agreeing terms. Risks are dealt with differently across countries, industries and sectors (DCDEP 2000). Terms, definitions and interpretations are as varied as the number of sources providing them (ACS 1998; DNV 1996; EC 1997, 1999; OECD 2001). There are no agreed unified definitions of risk analysis, assessment and management.