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SCHOOL OF BUSINESS, ECONOMICS AND LAW

Master Degree Project in Logistics and Transport Management

Supply Chain Risk Management in the Swedish Armed Forces

-A case study

Mikael Pari Sarakinis and Robert Carlsson

Supervisor: Jonas Flodén
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ABSTRACT

Supply chain risks can have a negative economic effect on an organization's supply chain. There is a previously identified need to develop the concept of supply chain risk management in the Swedish armed forces. This is due to increased government demands of cost efficiency and resource utilization in military logistics. The complex reality of military logistics does also affect the possibilities for development. The supply chain risk management process of the Swedish armed forces is analyzed from two theoretical aspects, critical success factors for risk management and a general theoretical supply chain risk management process. The analysis reveals different areas with potential for improvement and a number of suggestions are proposed. These are: properly educated personnel in the different steps of the process, utilizing the existing organizational structure by actually gathering for fixed planning meetings, an IT system for planning support, and a higher level of external recruitment in the organization. Focusing on, and improving, these areas will support communication within and between organizational levels, while helping the SAF to meet the external environments demands of cost efficiency and resource utilization.

Authors:

Mikael Pari Sarakinis and Robert Carlsson

Supervisor:

Jonas Flodén

KEY WORDS

Supply chain, Risk management, Supply chain risk management, Supply chain risk management process, Critical success factors, Swedish armed forces, Peace support operation

LIST OF ACRONYMS

ALARP:	As Low as Reasonably Practicable
CSF:	Critical Success Factors
EU:	European Union
EUFOR:	European Union Force
FMEA:	Failure Mode and Effect Analysis
FOI:	Totalförsvarets Forskningsinstitut
	(English: The Swedish Defense Research Agency)
INSS:	Insatsstaben
	(English: Mission Headquarters)
ISAF:	International Security Assistance Force
JOPG:	Joint Operational Planning Group
KFOR:	Kosovo Force, NATO-led international force in Kosovo
MUST:	Militära Underrättelse- och Säkerhetstjänsten
	(English: Swedish Military Intelligence and Security Service)
NATO:	North Atlantic Treaty Organization
NORDCAPS:	Nordic Coordinated Arrangement for Military Peace Support
OSCE:	Organization for Security and Co-operation in Europe
PSO:	Peace Support Operation
SAF:	Swedish Armed Forces
SCM:	Supply Chain Management
SCRM:	Supply Chain Risk Management
TCC:	Troop-Contributing Country
UN PK:	United Nations Peace Keeping
UN:	United Nations
UNTSO:	United Nations Truce Supervision Organization
WEU:	Western European Union

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1. INTRODUCTION

This chapter will discuss the context of the research problem. It starts with the background explaining the challenges identified and the context of the activities the research will focus on, military logistics and Supply Chain Risk Management (SCRM) in connection to international operations. Thereafter, the problem discussion and research aim is presented followed by the research questions. The chapter is concluded with the delimitations and the structure of the thesis.

1.1 Background

This section explains the importance and need of supply chains and SCRM in a military context.

1.1.1 Mitigating Supply Chain Risk

A supply chain is an important and often complex function in an organization and has taken an essential place in the research field of logistics over the last two decades. There are many different but often similar definitions of what a supply chain is and what it is meant to achieve. According to Russel & Taylor (2001) a supply chain is made up by a combination of interrelated actors, their processes and resources that create and deliver products or services to final users. Disruptions and inefficiencies in the supply chain can be a very challenging issue for an organization that requires long distance transportation. Supply chain disruptions and inefficiencies can be caused by various risks and, if not avoided, lead to costly activities to regain stability and efficiency. Depending on the organization, its processes, actors and stakeholders, the outcomes are always unique (Zsidisin & Ritchie, 2008). As a way to mitigate supply chain risks the concept of SCRM evolved and has during the last decade gained much attention in research and lead to a number of practical tools and methods to handle risks in various scenarios. SCRM can help organizations to decrease economic uncertainties in the supply chain by creating risk awareness and risk handling strategies. The theoretical SCRM process is a generic process, but when practiced it is adapted to different external and internal factors and is unique for the organization (Tang, 2005).

Different organizations have different resources for their activities. This includes the resources dedicated for the SCRM process and the resources available for supply chain expenses. The cost level of activities is an important factor for most organizations and is affected by the way an organization is funded (Waters, 2007). There is a difference between private and public organizations. Private organizations can easier justify supply chain

expenses as long as they generate profit, while public organizations that are dependent on tax revenues have another kind of budget restriction. Public organizations are also held responsible for their actions to a larger, but sometimes more diffuse, group of stakeholder, e.g. taxpayers and higher authorities. But the reality is often that these stakeholders demand that their resources are used in an efficient way, especially for activities in organizations that does not directly affect them. Such an organization is the military of a nation where the need for homeland defense does not exist or is very limited (Skoglund, 2012).

1.1.2 Military Logistics

As a military organization qualifies as a public organization, they face limited budgets, especially in smaller countries. Due to these budget restraints, it is not always possible to meet the political will of participation in international operations and domestic requirements such as homeland defense, at the same time (Försvarsdepartementet, 2009, Utrikesdepartementet, 2008a). Since the collapse of the Soviet Union and the Warsaw pact in 1991, the national threat level for many European countries, among them Sweden, decreased significantly and with this the need for a large homeland defense. Since then, Sweden has shifted its focus from national defense to a trend of a more global perspective with increasing commitments to international operations e.g. Afghanistan, Chad and Liberia. The term used for these kinds of international operations is Peace Support Operation (PSO) (see chapter 3.1). A crucial part of PSOs is the initial and continuing supply of resources required to fulfill the objectives of the particular operation (Skoglund, 2012).

The logistics section of the Swedish Armed Forces (SAF) is in a current state of transformation and the main driver behind this transformation is the economical rationality; to do more with less (Ternblad & Salomonsson, 2013). These two conditions, increased commitment to PSOs and to do more with less, has led to a situation that requires geographically extended supply chains in unfamiliar and complex environments, at the same time as the new set of demands for the SAF such as greater supply chain cost efficiency have to be considered (Dorn, 2009). For example, current requirements state that SAF should be able to participate in PSOs up to 6000 km from Brussels in a high number of different conditions (Skoglund, 2012). These conditions expose the supply chain to a high number of factors able to cause disruptions and inefficiencies if not handled properly which can lead to unnecessary economic costs. An example is the unloading of containers for the Liberia Operation in 2004. Personnel loading the containers in Sweden were not part of the deployment team on location in Liberia, which led to that the containers was not loaded in a

practical way for the unloading phase in combination with documents that were not fully accurate. Because of this inefficiency the personnel had to spend time reorganizing the inventory (Skoglund, 2012).

According to Lind et al. (2010) military logistics management´s ability to handle different kinds of risks within the supply chain and to quickly restore the chain after disruptions will increase due to increased demands of cost efficiency. In connection to this, (Ternblad & Salomonsson (2013) maps Swedish commercial logistics research and the areas within the SAF where commercial theories can contribute to developing concepts in the SAFs logistics. Supply Chain Management (SCM) and its sub-field SCRM are areas that strive to minimize supply chain inefficiencies within the SAF logistics in need of development according to Ternblad & Salomonsson (2013). Gustaf Salomonsson and Sten Ternblad are both researchers at the Swedish defense research agency (Försvarets Forskningsanstalt, FOI). They specialize in logistics research and Sten Ternblad is the head of a research unit at FOI. In their report, Ternblad & Salomonsson (2013) also identifies the difference in scale and scope of supply chain research in commercial and military contexts and states that the vast body of research deals with commercial supply chains. Although, there is a constant mix between military and commercial logistics, but due to the strong evolution of concepts and practices in commercial logistics in the last decades there have been stronger incentives for military logistics to learn and apply commercial concepts than the other way around (Ekström, 2004). Existing knowledge and research of commercial logistics can be used as support for developing concepts in military logistics, as long as the difference in context is properly understood and taken into consideration (Ternblad & Salomonsson, 2013). The main difference between these two contexts is their goal, purpose and the environment in which they function (see chapter 3). A PSO takes place in destabilized areas, e.g. Afghanistan, Chad and Liberia, where there are none or few alternatives to the own supply chain, which makes the operation more vulnerable and the supply chain more crucial for the ongoing operation. Supply chains serving PSOs also need to consider other requirements except cost efficiency, such as availability, redundancy and security aspects in forms of antagonistic threats. Much of the trendsetting commercial logistics and its contextual research do not share this reality, which shows the need for an understanding of the different contexts when applying commercial theories on military practices (Dorn, 2009). According to Pagonis & Cruikshank (1992), commercial supply chains strive for profit maximization, while a military supply chains are, in extreme cases, about life and death. Further, a military supply chain should contribute to fulfillment of

military goals by supporting and protecting operations and personnel, but reality also imposes economic conditions for this.

The efficiency of a PSO supply chain is determined not only by the internal and external factors themselves, but also how these are handled. Individual performances at all levels can affect the efficiency of a supply chain, but the major difference can be attained in the SCRM process for planning and maintaining a PSO. How an organization analyzes and manages potential risks and inefficiencies affecting a supply chain lead to different outcomes regarding its efficiency. Major changes in available resources for this process can also have an effect, but this is basically a political decision and is more often something to relate to than to change (Vanany et al., 2009).

The combination of these factors, including the research gap between military and commercial logistics, the economic limitations of military organizations, and the potential and need for development of SCRM in the SAF, creates opportunities for further studies.

1.2 Problem Discussion and Aim of Research

As mentioned above, the opportunity for further research leads to the SCRM process, that start in a preoperational phase, and its level of execution according to the context of the operations and commercial SCRM theories. By preoperational phase means the time period between the political request to participate in a particular PSO and the starting date of this PSO. The SCRM process is the process of organizing the supply of resources that aims to optimize the supply chain according to SAFs goals. It is an essential activity in risk mitigation (Waters, 2007). How this process is conducted is important for the resulting accuracy and efficiency of the SCRM approach for risk mitigation (Tummala & Schoenherr, 2011). The SCRM process is therefore a possible way to increase the cost efficiency in the supply chain, by creating approaches adapted to decrease the occurrence of unexpected events, since well-planned SCRM approaches help organizations to mitigate supply chain risks. Both the context of the supply chain and the internal conditions of the organization can affect the conduction of the SCRM process which makes these important factors to consider (Tang, 2005). As the operational environments can be complex, it can create problems in identifying and evaluating supply chain risks before a PSO. The conditions are made up of resources, structure and knowledge possessed by the SAF dedicated for these activities which can affect the results depending on how these are constituted (Richart, 1979). Therefore it is important to have

knowledge of the SCRM process and the different factors that affect this process in order to reach a more optimized PSO supply chain.

This research wants to make a contribution to the long term development of Swedish military logistics by analyzing the current SCRM process of the SAF for PSOs, and if possible identify room for improvement.

1.3 Purpose and Research Question

The purpose of this thesis is to identify Swedish armed force´s approach to supply chain risk management for peace support operations and analyze this from a commercial supply chain risk management theory perspective.

Main research question: Can the Swedish armed force´s supply chain risk management process for peace support operations be improved by commercial supply chain theory, and if so, how?

In order to answer the main question the below sub questions have to be answered.

Sub-question 1: What are the conditions for the Swedish armed force´s supply chain risk management process for peace support operations, and how is this process organized and conducted?

Sub-question 2: What does commercial theory say about efficient organizational supply chain risk management processes and conditions to conduct these?

1.4 Delimitations

This study is about SCRM in international PSOs for the SAF. The scope of this research does not include giving a full and exhaustive view of the supply chain or to map the SCRM process in detail. The focus is to identify the most vital planning and organizational aspects of SCRM process for PSOs.

Also, the term military logistics has a much broader definition than commercial logistics, which usually involves other commercial functions such as procurement and manufacturing of resources other than the core logistics activities. This thesis will not include these concepts but only focus on the SCRM process for PSOs.

1.5 Structure of the Thesis

In this section we give a short description of the different parts in the thesis in the order they appear. The internal order is adapted to ease the understanding while reading the thesis.

Chapter 1 Introduction

The chapter starts with the background of the research leading up to the problem which explains the importance of SCRM to military logistics. This is followed by a presentation of the purpose and the research questions. The chapter also includes delimitations and the structure of the thesis.

Chapter 2 Research Method

The chapter is divided in a number of parts discussing different aspects of the research design. Research philosophy and research approach is discussed in the first part followed by a discussion about case study research. Thereafter follows a discussion about the actual research process and the data collection. The final part of the chapter discusses the reliability and validity of the results.

Chapter 3 The Supply Chain in a PSO context

This chapter presents the PSO and gives a brief overview of Sweden´s connection to PSOs, both historically and present. This is followed by a discussion about supply chains in the context of PSOs.

Chapter 4 Theoretical Framework

The theoretical chapter presents a number of aspects of efficient SCRM. It starts with explaining a generic SCRM process from commercial theory followed by a presentation and discussion of a number of Critical Success Factors (CSFs) in the context of, and their importance to, risk management. This chapter answers sub question 2

Chapter 5 The SAFs Supply Chain Risk Management Process

The empirical chapter presents the results of the data collection and describes the organizational structure connected to the SCRM process and the composition and conduction of this process with its various parts. This chapter answers sub question 1.

Chapter 6 Analysis and Discussion

This chapter analyses and discusses the SCRM process for PSOs in the light of the theoretical perspectives presented in chapter 4. This chapter answers the main research question.

Chapter 7 Conclusion

This chapter concludes the thesis by presenting a short summary of the research and answers to each of the research questions.

2. RESEARCH METHOD

This chapter describes how the research was conducted, the challenges faced and the choices made. The first section describes the research philosophy and research approach, followed by sections covering the chosen research strategy, the research process and data collection. The last section discusses the reliability and validity of the results.

2.1 Research Philosophy and Research Approach

Two philosophies are traditionally used to define a research approach: Positivism and interpretivism. Under the positivistic paradigm, the formulation of theories derives from empirical observations with the goal to predict or explain a phenomenon (Collis J & Hussey, 2009). The goal is to discover theory based on empirical research which can be seen objectively. Interpretivist approach is when reality is seen as subjective and shaped by our own perceptions. Exploring and understanding the complexity for a phenomenon is the focus. It is often based on open dialogues and qualitative research. This research philosophy is useful when there is a constant change in behavior and opinions of the subjects. Positivism is primarily connected to measuring a phenomenon through quantitative methods while interpretivism is related to exploring its complexity through qualitative methods (Collis J & Hussey, 2009). This research has an interprevistic perspective when studying the SCRM process of PSOs. The single phenomena are explored qualitatively in its natural setting. No attempts to control any characteristics of the phenomena are done and the result is interpreted by the authors which give a subjective image.

There are three main approaches when conducting research. These are induction, abduction and deduction. The deductive approach aims at testing or evaluating existing theory i.e. theories from scientific literature are tested in a new phenomenon (Saunders et al., 2012). The inductive approach generates new theory based on known premises. The third approach is the abductive approach, where known theory is used to create testable conclusions. The abductive approach is suitable when there is much knowledge in one context but far less in the context in which the research is undertaken (Saunders et al., 2012). The emphasis on different contexts regarding commercial and military logistics argues for an abductive approach since there is a lot more research done on commercial than military SCRM. However, as the main focus of this research is to test commercial theory in a military context and to suggest improvements for the SAFs SCRM process this research has a predominantly deductive approach.

2.2 Case Study Research

This section describes the chosen research strategy and the connection between the above research philosophy and approach and the below described choice of method for data collection and analysis. This part explains what a case study is and discusses why it was used in this research.

A case study is an analysis of a person, group, organization, project, event, phenomena or any other kind of system that is studied in its completeness by one or several methods. The case in focus of a study forms an analytical frame in which the study is conducted (Saunders, et al., 2012). As a research method a case study is appropriate when a high number of relationships and factors are present (Fidel, 2009). According to Yin (2009) a case study is a good way to explore a phenomenon or research topic within its context, in its real life setting. It can provide a deep and rich understanding of the context and the phenomenon being enacted. Since this thesis has a strong emphasis on the context of the phenomenon it aims to study a case study is suitable to meet the requirement.

The case study research strategy is usually good at answering research questions such as 'why?' and 'how?' (Yin, 2009). The main research question in this thesis is a 'how' question (see chapter 1.3). To answer the research questions the research took a cross sectional approach. This means that this research does not follow the organization over a period of time but instead makes interviews at a particular point of time (Saunders, et al., 2012). The cross-sectional approach was chosen partly due to the time limitations of the research and partly due to the limitations in access to the organization given by the SAF. Even though there is an obvious discussion whether or not a longitudal case study would have been more suitable to study the process in focus of this research, reality imposes limitations which have to be taken into consideration.

When conducting qualitative elements of research, e.g. interviews, it is important to have as few pre-conceived ideas as possible (Voss, et al., 2002). But according to Eisenhardt (1989) it is also important to understand the dynamics of the particular setting when conducting a case study. It is important to be aware of this as these two are somewhat contradictory. When using a single case, as is done in this research, it is important to define the actual case (Saunders, et al., 2012). A description of the context of the case can be found in chapter 3 and chapter 1 contains delimitations and definitions of the problem and the research questions. This case study is unique by nature. Even though other countries have similar organizations

such as the SAF, that are actively participating in the same and similar PSO's with similar SCRM challenges, the SAF can be considered a unique organization in Sweden. This research is a single and unique case study since access to foreign countries defense organizations lies beyond the resources of this research.

The discussion above argues for a case study but no strategy is without its limitations. Case study research has attracted much criticism and is said to be too specific for the researched phenomenon and not open to generalizations. This means that the results are not applicable to other settings and contexts (Weick, 1969). The term particularization, i.e. create an in depth picture of the phenomenon, can be used in contrast to generalization (Stake, 1995). Other limitations are that a case study often is a time and resource consuming process (Vissak, 2010). Also case studies often generate a wide scope of data and there is a risk that researchers lose focus of the research questions by being overwhelmed by this data (Halinen & Törnroos, 2005). These limitations have been taken into consideration during the research process.

2.3 The Research Process and the Data Collection

This study is divided in several overlapping parts as illustrated below, in Figure 1. The preliminary literature review included academic reports and articles in the field of military supply chains, where a clear research gap was identified regarding supply chain risk management in a Swedish military context. Much of the initial literature reviewed has been published by FOI and other international authors in the field of military logistics. FOI is a Swedish research institute focused on defense and security research (FOI, 2013). The institute answers to the government as a government agency and has a unique scale and scope of scientific literature regarding military logistics in connection to the SAF. FOI conducts research on both government requests and offer their services on the market. The FOI reports used in this thesis have all been ordered by the Swedish government and the SAF. It has been a very useful source for material related to the SAF. The relevance of SCRM is strengthened by the impact it can have on organizational performance and its potential for development within a military context. From discussions with several key researchers at FOI, a number of relevant people within the SAF organization were identified as suitable to take part in the planned interviews. These are people directly involved in the logistics planning process for PSOs, and the information collected from the interviews should therefore be as relevant as possible for this thesis. Easterby-Smith et al (2008) and Jankowicz (2005) states that interviews are a suitable way to collect data when the questions are complex and/or open

ended as they are in this research. A common typology of types of interviews is structured, semi-structured and unstructured interviews. Structured interviews use predetermined questions and are used to collect quantifiable data. A semi-structured interview has a list of topics to be covered. It allows for adjustments of topics and questions between interviews depending on the conversation and the person interviewed. This type of interview also gives room for an open discussion within the selected topics. An unstructured interview is informal and used to explore in-depth a general area of interest. There is no list of predetermined questions in an unstructured interview conversation (Saunders et al., 2012). The discussions with the FOI researchers worked as explorative test interviews, from which it was concluded that a semi-structured and relaxed but yet focused approach worked well to collect the data needed. This approach gave the interviewees the possibility to speak freely about the questions and the interviewers had the possibility to restructure and ask relevant follow up questions depending on the conversation (Saunders et al., 2012).

As planned, the interviews took place in mid April 2013 at J4, the department of the SAF responsible for operational logistics. The department was informed beforehand about the focus of the research in order to grant access to the most appropriate participants with experience in analyzing and managing risks in supply chains. Two leading officers were interviewed on location at their department. They were given the topics of our research before the interview to be able to answer our questions to the best of their knowledge. They also provided both in depth answers to the questions and secondary data in the form of documents related to the research field. They provided the functional layout, their opinions and experience of the SCRM process, and the level of knowledge held by the interviewers enabled an ability to ask questions that avoided a shallow description of the subject. Opportunity was given to contact the interviewees again to clarify or explain any follow up questions.

The secondary data in this research was text and non-text materials. The text materials consist of FOI reports about SAF organization and PSOs. The non-text materials consist of graphical figures of organizational structures and decision processes provided from the interviewees.

The literature review identified commercial SCRM processes and a number of Critical Success Factors (CSFs) for risk management by conducting literature searches in international journal catalogues, using the search tool Summon and Google scholar. The search process was based on key phrases such as: risk management process, supply chain risk management process, and Critical success factors for risk management. The results showed a clear pattern

and enabled a well-supported theoretical framework. The literature review was ongoing and parallel to the other parts in this research as illustrated in Figure 1.

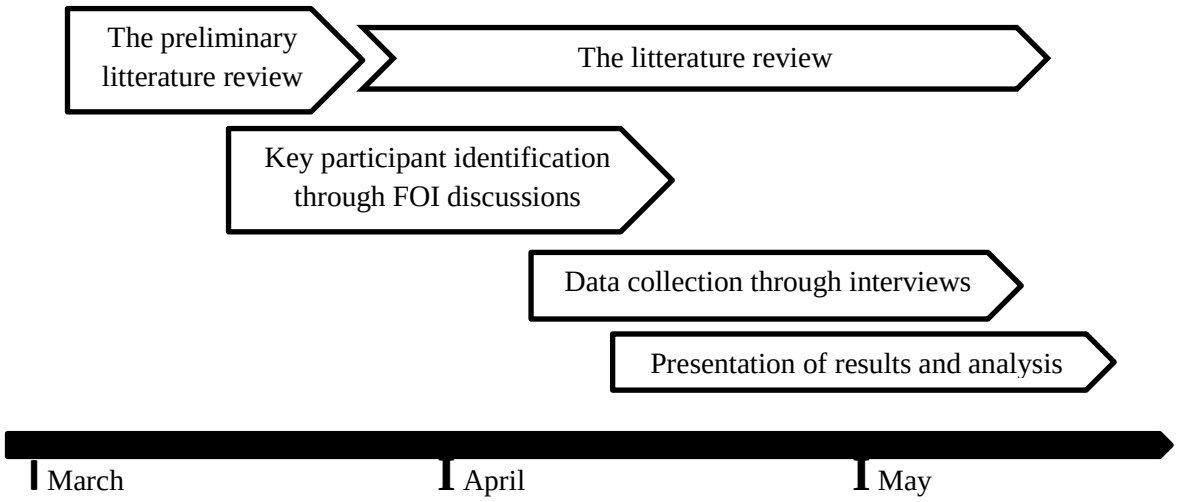

Figure 1: Research process time-line, Source: Own illustration

As a first step, all the data gathered from the interviews and the secondary data material was categorized in two categories, which were the risk management framework for the SAFs and the organizational structure surrounding this. As a second step, the data was presented in three main parts: the organizational structure, the SAF SCRM framework and a holistic process description of SCRM. The analysis was performed with the interview data and the secondary data in Swedish. The translation of the data to English has been freely done by the authors while writing this thesis.

In the analysis the SAFs SCRM process is analyzed from a theoretical framework containing a SCRM process and the underlying conditions for this process, constituted by a number of CSFs which are further described in chapter 4. The major part of the analysis is to compare the empirical results with theoretical propositions. Chapter 3 provides the analysis with the ability to connect to the PSO case study context.

2.4 The Reliability and Validity of the Study

Reliability and validity are considered important concepts in modern scientific research. Reliability is to the degree the assessment tool used produces results that are stable and consistent. Validity is how well the tools and measures applied actually measures what they are intended to measure (Saunders et al., 2012). As described above, the data collected for this research was through semi-structured interviews. According to Saunders et al., (2012), semi-structured interviews can achieve a high level of validity depending on how the interviews are

conducted. We, the interviewers, made necessary preparations to the best of our ability, based on scientific theory, in this research. Also the opportunity to discuss both the topic of the thesis, and later the empirical material, with different experts, such as the researchers at FOI specialized on defense research, have been useful when choosing theory, relevant participants, and checking as well as clarifying empirical issues.

There are some data quality issues associated with this method that can affect the reliability and validity of the research which will be discussed in this section. Reliability in the context of qualitative interviews relates to if other researchers would receive similar information under similar circumstances, and a number of different bias issues (Easterby-Smith et al., 2008). As the interviews were recorded, all the data was preserved and the interviewers could focus more on questioning and listening (Easterby-Smith, et al., 2008). Because information about the topic of the interviews was sent to the participants before the interview, the participants had a relevant level of knowledge about the topic. This allowed for more relevant questions, follow-up questions and better prepared participants, which promote both validity and reliability of the interview results (cf. Saunders et al., 2012).

It is important to point out the existence of some level of participation bias since the research, with several attempts, did not gain access to all the desired participants. This was due to a major reorganization of many departments related to logistics during the time of this research. Although, these people who could not participate due to time restraints, were not the main people working in or with the SCRM process, but with other parts of military logistics. The goal was to get further information and partially triangulate the two main interviews with the information of the non-participating people. However, this was not possible. Instead, a number of documents were provided, which allowed for triangulation of some of the data, mainly organizational structures and decision ‘paths’. Also, the information provided from the two interviewed officers showed a consistent view of the SCRM process.

There can always be discussions about the reliability and validity of research and it is hard to reach good reliability in qualitative research (Saunders et al., 2012). But it is argued that this thesis contains a relatively strong level in both aspects, and that the researchers are aware of the various limitations of the research methods used.

Also, regarding the theoretical chapter, it is important to clarify that even though the CSFs do not explicitly target SCRM they are generic and can be applied on risk management in any context.

3. THE SUPPLY CHAIN IN A PSO CONTEXT

This chapter will briefly present military logistics and focus on logistics in the context of PSOs. The chapter also gives a brief overview of Sweden's connection to PSOs, both historically and present.

It is important to note that the definition of logistics in a military context usually involve several commercial functions such as procurement, manufacturing and maintenance other than the core logistics activities. In this thesis, the term logistics, when used, will only relate to the core logistics activities of transferring goods, personnel and information from the original location to the area of operation (Skoglund & Dorn, 2008). Research in military logistics started long before research in commercial logistics, which entered the field in the 60´s, although it does not have the same scale and scope as the latter. Commercial logistics has had a higher level of development and during the last two decades, peer-reviewed research in military logistics has been rare in comparison (Skoglund, 2012).

Military logistics can be divided into a number of types of logistics. The two main types are peace time military logistics and war time military logistics (Skoglund, 2012). In a Swedish context, these two types have a strong connection to the former homeland invasion defense. Transporting resources in war time did not have the same cost efficiency requirements as of today. The most important goal was to get the resources to the place where they were needed. Some slack in the supply chain could be useful in case of losses. Peace time logistics were mainly utilized in exercises and had piles of stock resources to its disposal. Today, with a different focus and new requirements for military logistics (see chapter 1.1), there is a third type that has emerged in between these two, which is logistics in times of crisis. This third type is what is utilized in PSOs and it is the type that will be further explored in this chapter (Skoglund, 2012).

3.1 The Peace Support Operation

Peace Support Operation (PSO) is a term that primarily was used to cover peace enforcement and peace keeping operations. Today, the term PSO is the standard term used for a spectrum of modern activities to support international security and peace such as, humanitarian assistance, peace building, conflict prevention, peace enforcement, and peace keeping (Woodhouse & Ramsbotham, 2000).

3.1.1 Sweden and Peace Support Operations

Sweden has a long history of participating in PSOs. The first United Nations Peace Keeping (UN PK) operation, the UN Truce Supervision Organization (UNTSO) in Egypt, Israel, Jordan, Lebanon and Syria in 1948 included military observers from Sweden. During the Cold War, Sweden became an active Troop-Contributing Country (TCC) that participated in 11 out of 13 UN PK and observer operations, e.g. Lebanon (1978), Suez and Sinai (1973-1979 and 1956-1967), Cyprus (1964) and Congo (1960-1964) (Jakobsen, 2006, The Swedish Armed Forces, 2006c).

Close to 1 million troops from 130 countries have participated in UN PK operations since 1948 (Bellamy et al., 2010). Before the end of the Cold War, the major TCC's were the Nordic countries, Canada, India and Ireland. This shifted to be UK, France, the Netherlands and Canada in 1993, and in 2005, to Nigeria, India, Bangladesh and Pakistan. Sweden still participates in many UN PK operations but does not have such a significant role as during the Cold War. Although, there are other framework organizations for PSOs except the UN, e.g. EU, NATO, Western European Union (WEU), Organization for Security and Co-operation in Europe (OSCE), the Nordic Coordinated Arrangement for Military Peace Support (NORDCAPS) and operations such as ISAF, KFOR, EUFOR etc. where Sweden participates and have participated since the end of the Cold war (Tillberg, et al., 2007). From 1956 to 2006, more than 100 000 Swedish soldier missions has been sent to participate in some kind of PSO in over 120 operations and 500 – 1000 soldiers have almost all the time been deployed in a UN operation (The Swedish Armed Forces, 2006c, Sjöstrand, 2007). Today, the Swedish government requires that the SAF should be able to support 1500-2000 soldiers participating in an international PSO at any given time (Försvarsdepartementet, 2009). A tradition in Swedish PSOs is also that when there is a shift in personnel at the PSO location, 100% of the personnel are replaced at the same time.

The long term objectives all PSOs share are to contribute to lasting peace and to create safety in the area of operation. Although there can occasionally be other long term objectives, challenges and problems are usually the same (UN, 2008b, Försvarsmakten, 1997).

3.2 The Peace Support Operation Supply Chain

The supply chain in a PSO is about supporting units in the operational area with services, supplies and transportation. PSOs often start with a short notice and the division responsible for the supply chain has a limited time to prepare for the unique settings in the area of operation (Skoglund, 2012). In addition to this, a PSO´s area of operation is typically

thousands of kilometers from its Home Logistics Base. The current political requirement for Swedish military units is that they should be able to participate in PSOs as far as 6000 kilometers from Brussels (Lindström, 2007).

Major aspects of PSOs supply chains are that there is a high level of complexity and an uncertainty regarding the operation. Commercial, and to some extent humanitarian supply chains, does not share this complexity. This creates a need for contingency plans if there is a change in the operational requirements or if some kind of hostile activity occurs that can disrupt the supply chain (Skoglund & Dorn, 2008). The presence of terrorists or hostile factions seeking to disrupt the supporting supply chains naturally creates high requirements on these supply chains. It is also not possible in such situations to rely on that international laws concerning war and combatants will be followed. Although, international law states that the whole military supply chain is an accepted target for hostile activities during a military operation (Försvarsdepartementet, 1996a).

The military supply chain can contain a vast number of products ranging from complex fighter jets to drinking water and base camp services in both medical and technical fields Supporting a Swedish company size operation of 100-200 personnel requires a supply chain handling more than 50,000 spare parts and around 2000 main products (Skoglund & Dorn, 2008). These complex factors contribute to the high degree of uncertainty in PSOs. To be able to achieve efficient and effective logistics activities an organization need to know what it wants to achieve. This requirement is usually fulfilled for commercial supply chains but military supply chains sometimes lack this (Skoglund, 2012). According to Ohlson, (2008) it is not possible to know the specific plans of other actors, peaceful or hostile. Unexpected changes to the operation can occur and the lack of information hinders logistics personnel from knowing exactly what kind of operation to support in advance. This leads to a mistrust of the operational supply chain, and the units strive to bring as much resources as possible in the deployment phase to avoid a stock out. Also, the Swedish tradition of replacing all its personnel at once in long term PSOs, creates uncertainties for future logistics needs since different leading officers can have different objectives than can affect logistics activities (Dorn, 2009).

Geographically and organizationally dispersed commercial supply chains are based on an established practice of continuous improvement over time. This continuity is something that often does not exist in military supply chains, the exception would be long term PSOs, e.g.

Afghanistan, where continuity can be built. But most PSOs are so short that this way of making supply chains more efficient is less useful (Skoglund, 2012).

The decision to participate in a PSO is a political decision and followed by a logistics decision how to supply the operating units over time. According to Kress (2002), there are three alternatives for military logistics that affects the scope and scale of resources; to obtain the required resources from the area of operation; to carry the required resources with the unit; and to transport the required resources to the units from outside the area of operation. Modern solutions are a combination of all three alternatives. If military logistics cannot provide a supply chain that guarantees a steady flow of required resources at the right time and right speed, the PSO cannot perform its tasks or fulfill its goals, regardless of other factors. Depending on the specifics of the operations, it will in every case be a unique setting for the combination of logistics activities. The important thing here is the duration of the operation. The third alternative is most useful when a PSO lasts six months or more, and the first alternative is most common for shorter PSOs of a few weeks.

3.2.1 Sweden as a Small Nation

As a small nation´s military organization, the SAF participates, as previously mentioned, in PSOs under an international framework (the EU, NATO or the UN or a leading nation). Equipment, services and consumables together create and support the units in a PSO. To be able to get all the required resources in a PSO to the area of operation, SAF have to establish relations with these organizations and depend on them in some aspects. The SAF also have to initiate cooperation relationships with a number of actors such as other nations and organizations that participates in the operation and the host nation, as well as local, domestic and international suppliers and transport providers (Skoglund, 2012). The Swedish government also states that in the planning phase of PSOs, it wish to see increased international cooperation in the supply chain if it leads to sharing of supply chain costs, access to competences otherwise unavailable, and an increased operative efficiency, even if this means outsourcing some of the supply chain activities (Försvarsdepartementet, 2009). However, the Swedish government declared in 2009 that a major part of the logistics activities in the forward operations area, the area closest to the units, must be handled by the SAF´s own personnel (Försvarsdepartementet, 2009).

Small nations, such as Sweden, typically value a flexible supply chain as each operation in some aspect is unique; Allied partners can differ, the tasks and goal can differ and the

equipment required to perform these tasks or fulfill these goals can differ. Also, the requirements put forward from nations´ governments strive for an ability to participate in PSOs in a wide variety of conditions (Skoglund, 2012). The logistics system, including the supply chain, must be adaptable to different circumstances and be able to operate in areas with limited support from civil infrastructure (Försvarsdepartementet, 2009). Different political, environmental, legal, cultural, economic, and technical factors will affect the supply chain. A commercial organization can evaluate a specific location for proposed activities, and if it is not suitable they can look for something more suitable. The SAF does not have the same possibility and have to adjust to, in the end, the political will (Skoglund & Dorn, 2008).

The logistics function in PSOs must not only handle the requirements and conditions it faces in the operational environment, it also have to be efficient with taxpayer´s money. In contrast to the SAF expenditures, which falls in the frame of a governmental organization, expenditures in commercial logistics are to some extent justified as long as they generate revenues. As a government organization, the SAF have budget restrictions in a way that commercial organizations do not. Even if increased expenditures would bring increased benefits it might not be possible or viable to increase spending, which again points to the need of greater cost efficiency and ways to improve this (Dorn, 2009).

3.2.2 Levels in Military Logistics

According to Kress (2002), military logistics can be divided into a strategic, operational and tactical level, all with slightly different goals. The strategic level is concerned with long term decisions for military infrastructure, SCM, i.e. storage and resources for transportation, technology and related defense industry. When evaluating different strategies, the economic aspects have to be considered. This means that an important factor in the planning process of strategic logistics is the cost efficiency, i.e. the inputs in logistics capabilities and the presumed outputs and their ratio. The next level is the operational level of logistics. Usually, this level is connected to the area of operations and is concerned with setting up, operating, analyzing and prioritizing current and future logistics needs. This is why it is called operational level. In other contexts, the name operational refers to the level below the tactical level, which is important to keep in mind and should not be confused. This is also the level focused on in this thesis. The logistics level closest to the military units is the tactical level. This is where units are being supplied with the required supplies they need e.g. ammunition, fuel and services, to perform their tasks on a daily basis and achieve the operational objectives. The most important factor at this level is not the cost but the effect of the action.

The main goal with logistics on this level is to provide the units with the right equipment in terms of quantity and quality at the right time (Kress, 2002). Although, the concept just-in-time (to deliver the correct product exactly when needed) is not applicable here due to the above mentioned challenges in PSOs, instead the logistics concept is better described by just-in-case.

What is shown above is the gradual shift in goal of the supply chain, from a greater economic perspective on the strategic level, which at the tactical level, has shifted towards a stronger focus on the effects of the actions taken. The operational level lies in between the strategic and tactical level and face a combination of the cost efficiency and ‘effect of action’.

As described in this chapter, military logistics and supply chains face a complex reality. The importance of a functional logistics system and consideration of the complex reality is crucial for the success of PSOs.

4. THEORETICAL FRAMEWORK

This chapter provides a theoretical framework for an efficient SCRM process. The first part presents an overview of the key concepts of SCRM, the second part presents the SCRM process, and the third part presents Critical Success Factors (CSFs) for risk management. The last two topics are identified as vital for SCRM.

4.1 Overview of Key Concepts of SCRM

This section describes SCRM and the concepts which combined constitute SCRM.

4.1.1 Supply Chain

A supply chain is the combination of interrelated actors with their processes and resources that create and deliver products or services to final users (Russel & Taylor, 2001). According to Waters (2007), a supply chain consists of a number of activities and organizations in which material move from the supplier to final user. Material includes both intangible and tangible resources.

4.1.2 Supply Chain Management

According to Iwan Vanany (2009), SCM is the management philosophy related to the interaction between interrelated business actors. The term Supply Chain Management (SCM) first appeared in literature in the 1970's and currently has more than one definition (Lysons & Farrington, 2006). Mentzer, et al. (2001), defines it as a strategic and systematic coordination of traditional functions within a supply chain, for the purpose of improving the long-term performance of the individual organization and the supply chain as a whole. SCM is the organizational function that is responsible for the transportation and storage of the goods from the original location to the final user (Waters, 2007).

4.1.3 Risks and Risk Management

The definition of a risk is, according to Waters (2007) an event that might occur that disrupts the normal activities and hinders them from performing as planned or as usual. In a supply chain context, risk is usually treated as something negative that occurs unexpected and has an impact on operations with undesired results (Walker, et al., 2003). The probability and consequence of an event decides the severity of the risk. The underlying cause to risk is uncertainty about the future (Mentzer et al., 2001). Risk management is defined as the process of identifying, analyzing and responding to risks in an organization (Waters, 2007). According to Shahriari (2011), risk management is about managing risks by taking actions that will reduce the probability and consequence of unwanted and unexpected events of failure.

There can be two kinds of risks in a supply chain. External risks occur from events outside the chain e.g. political regulations or antagonistic threats. External risks are less frequent but almost impossible for managers to mitigate and control. Internal risks are connected to the organizations inner operations and day-to-day activities. This can be delayed deliveries, equipment fails, poor forecasts, inventory miss planning and failure in information technology systems. Internal risks usually have a lighter impact on the supply chain but are far more frequent (Waters, 2007).

4.1.4 Supply Chain Risk Management

Academic research has identified SCRM as a key concept in organizations core strategy for optimized efficiency (Waters, 2007). SCRM is based on the two previous concepts of SCM and risk management as illustrated in Figure 2. There are a number of definitions of SCRM. According to Waters (2007), supply chain risk management is about controlling the risks and uncertainties that has an impact on, or are caused by, logistics and logistics related activities. Organizations' motives to manage risks typically conclude to hedging against financial loss. In supply chains, this type of loss is created by events causing chain inefficiencies, miss-communication, and disruptions (Waters, 2007).

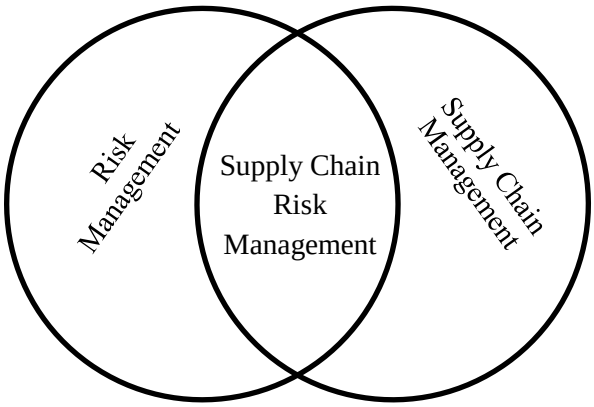

Figure 2: Supply chain risk management, Source: Vilko (2012)

An efficient SCRM process for a complex supply chain does not allow for any isolated investigations or single actor processes. Due to an often existing interdependency of organizational activities, all actors affecting the supply chain should be involved in the process (Juttner, 2005).

4.2 Supply Chain Risk Management Process

Some types of risks exist in all modern supply chains; form the least complex supply chains to supply chains with several interdependent organizations possessing different processes and strategies trying to achieve the same or different goals (Norrman & Lindroth, 2004). In order to prevent disruptions or other negative effects on organizational supply chain efficiency, organizations need to develop strategies to encounter these risks. This can systematically be done by implementing a proactive approach to risk management, which by many researchers is defined as supply chain risk management process (Tummala & Schoenherr, 2011). According to Vanany et al., (2009), the SCRM process refers to the steps organizations can follow to reduce supply chain risks. It usually includes activities such as identifying risks, probability assessment, consequence assessment and risk prioritizing in order to develop strategies for risk mitigation. Other authors have defined this process with similar definitions and steps (Vilko, 2012). Norrman & Lindroth (2004) also states that there are several different definitions on the SCRM process but that most of them have the same basic functionality with modifications to suit the intended situation. Waters (2007) present a similar process consisting of three steps; risk identification, risk analysis and risk control, see Figure 3.

Figure 3: SCRM Framework, Source: Waters (2007)

This generic framework has been successfully applied in organizations to identify and manage risk factors by assessing their possibility of occurrence (Tummala & Schoenherr, 2011). It has been proven to help organizations with different business strategies and to manage supply chain risks. SCRM process is only a framework and each of the steps has to be tailored to the specific supply chain, but the steps are important and should not be ignored (Tummala & Schoenherr, 2011). SCRM is preferably conducted in collaboration with other actors in the supply chain (Norrman & Lindroth, 2004). Tummala & Mak (2001) and Tummala et al., (2003) also states that the framework is efficient and flexible and the different steps can be applied and adjusted to any organization regardless of its internal or external enviroment. The following sections will further describe the different steps of a framework for risk management in supply chains.

4.2.1 Risk Identification

Risk identification is generally an agreed first step in a SCRM process. It is also a key activity in this whole process which all subsequent activities are based on (Waters, 2007). Tummala &

Schoenherr (2011) states that it is important to map as many risks in the supply chain as possible. Although, it is impossible to identify every existing possible risk and the practical reality of risk identification will only cover the most important risks in terms of their influence on the supply chain. Risk identification requires an understanding of the particular supply chain and its specific features. Inter-organizational actors typically have the most significant knowledge of the organization but not necessarily the knowledge to identify related risks. Waters (2007) also states that risk identification is an important step and that an organization needs a formal procedure for risk identification, and should not rely on individual knowledge and informal procedures. If an organization relies on personal knowledge or informal procedures, the results of the risk identification may suffer from inadequate scale and scope regarding these risks. This can affect the later steps in the SCRM process by providing an incomplete view of the results. Risk identification also needs a structured and comprehensive approach to identify potential supply chain risk. The risk variety, interrelationship and relationship with other actors are important to understand in a supply chain context (Tummala & Schoenherr, 2011).

It should be mentioned that there are a number of tools for risk identification for risk management in supply chains available, but it is beyond the scope of this thesis to provide a detailed and thorough description of these tools. A number of such tools are: event tree analysis, supply chain mapping, fault tree analysis, checklists or check sheets, failure mode effect analysis (FMEA) and cause and effect analysis (CEA). The underlying point of these tools is to map the supply chain in various ways to easier be able to identify related risks (Tummala, et al., 1994).

4.2.2 Risk Analysis

Analyzing risks includes assessment of consequences and probability of the identified risks in order to assess their severity. Norrman & Lindroth (2004) propose a risk matrix with two dimensions based on assessments of probability and consequence. The risk matrix illustrated in Figure 4 is used to assess the severity of the identified risks.

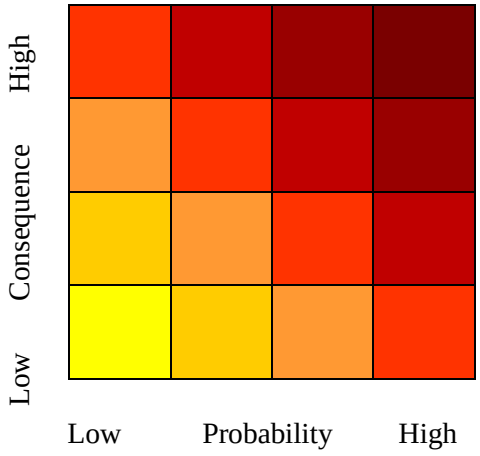

Figure 4: Risk Matrix, Source: Norrman & Lindroth (2004)

Consequences are defined as the extent a threat may affect an organizations activities and resources (Tummala & Schoenherr, 2011). Organizations are most often defining consequence in terms of financial asset loss, but it can also be direct damage to humans in the system (Waters, 2007). Establishing different severity categories for the risks can help organizations to rank and prioritize risks. The categories are basically defined as the magnitude of the consequence. Crockford (1986) defines the categories as trivial, small, medium and large. The trivial occur with a minor consequence, usually with a very high frequency. These may be smaller events in day-to-day business activities which are easy to predict and sometimes ignored. The large consequences on the other hand, have the largest impact. These are usually less frequent e.g. natural disasters or terrorist attacks. Thus, they are also much harder to predict and prepare for. Risks with small consequences are often more frequent and have a higher probability of occurrence than risks with large consequences. This makes the former easier to predict and prepare for and, the latter much harder to predict and prepare for (Crockford, 1986). To complete the risk analysis, Tummala & Schoenherr (2011) suggests a qualitative approach to decide the probability of risk occurance. This can be adapted to any kind of supply chain. It is based on scale where different categories are defined according to degree of probability. The categories are; often, infrequent, rare and extremely rare. Often can represent an ocurrence rate of once a week, while extremely rare can be once a year. The probability assessment for each risk can, and are often, conducted qualitatively. Focus groups, interviews with experts, and skilled employees, are a potential source for this part based on their beliefs, judgments and approximations. A quantitative probability assessment can also be used but requires sufficient data of historical events. The quantitative assessment typically yields better results in more stable environments and quantitative

assessments yield better results in more unstable environments (Tummala & Schoenherr, 2011).

The risk matrix and the categories presented above is a generic approach, and different authors present different scales for both consequences and probability. The probability or consequence assessment is less complex, but also becomes more general, which could jeopardize the usefulness if applied in an inappropriate context (Zsidisin, 2003). The risk matrix is widely used and strives to give an understanding of how significant the risks are compared to each other and to decide which risks need the most attention. Risks with a higher level of severity should be given more attention. By evaluating each risk individually, an extensive image of the most significant risks and a ranking matrix can be created. This is a way for an organization to prioritize risks and calculate the budget for risk management (Waters, 2007). Some authors also display the risks in different colors depending on their severity. Other chooses to assign weights according to consequence and probability, and multiply the two with each other to determine the severity level (Iwan Vanany, 2009). Regardless of the method used, it is highly important to separate risks from each other and prioritize the important ones in order to achieve organizational and economic efficiency in SCRM (Tummala & Schoenherr, 2011).

4.2.3 Risk Control

Following the risk identification and analysis, the risks have to be properly managed. It is essential for any organization to be prepared for disturbances in supply chain activities and be able to manage operations during disruptions (Tang, 2007). According to Waters (2007), the activity of risk management following the risk analysis is about designing an appropriate response, which means to decide best way to handle the risks under the circumstances. Since organizations have limited resources, there should be careful planning related to the amount of resources necessary for managing the risks. Risk managing plans can be developed once risks have been identified and prioritized (Tummala & Schoenherr, 2011). Risks with a higher level of severity should be prioritized in the planning process. It is also very important to identify the type of risk in order to see which area of the organization it can affect and to adjust counter measures accordingly. According to Tang (2007), supply chain risk control can be defined in two terms: Supply risk management and demand risk management. Supply risk management is measures regarding relationships, network planning, transportation and

logistics. Demand risk management concern issues which such as demand forecasting, planning and inventory management. It is essential for any firm to be prepared for disturbance in these activities and be able to manage operations during occurrence of unwanted events (Tang, 2007). Risk mitigation focuses on reducing the severity, frequency and probability of unexpected and unwanted events. SCRM plans can be developed once risks have been identified and their consequence severity and probability determined (Tummala & Schoenherr, 2011). According to Tang, (2006), organizations are more willing to implement certain supply chain risk mitigation plans if these strategies have two specific features. The first one is efficiency, where the strategy would enable a firm to manage risks and keep its efficiency regardless of the occurrence of disturbing events. The second is resiliency, which enables a firm to sustain its operations during major disturbing events and recover quickly afterwards (Tang, 2005).

The risk control also depends on the organizations' risk perception which differs between people and organizations. People in organizations face decisions every day, and if risk would not be accepted at all, no decisions would ever be made (Shahriari, 2011). Shahriari, (2011) describes the 'as low as reasonable possible '(ALARP) risk acceptance model, illustrated in Figure 5 and its three general levels: unacceptable risk, however acceptable in extraordinary situations; the mid-level is a tolerable region where risk are accepted if reduction is impractical or expensive in relation to what is gained; the bottom-level are acceptable risk that are regarded as insignificant or controlled.

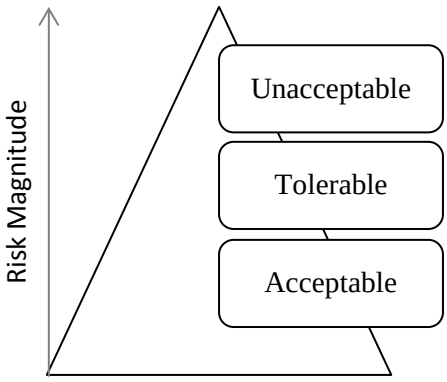

Figure 5: Triangular ALARP model, Source: Tummala & Schoenherr (2011)

Waters (2007) presents a number of options for responding to risks depending on their severity and acceptance level. These are to accept or ignore the risk, reduce or limit the

consequences of the risk, transfer the risk, reduce the probability of the risk, share or deflect the risk, make contingency plans, adapt to it, oppose a change, or move to another environment. Risks can be ranked and classified by using the ALARP principle where the unacceptable risks are mitigated with the action mentioned above (Waters, 2007). The selection of mitigating certain risks is important, where decisions that leads to less inefficiency can lead to large cost reductions. Also, reluctance to accepting some risks can lead to unnecessary mitigation cost. A simple example is stated by Tummala & Schoenherr (2011) about late delivery of pencils to a facility. Pencils are not critical for the facility's operational efficiency if its main activity is to produce rubbers. Spending resources on mitigating this delivery may therefore be seen as unnecessary. However, if the company's core activity is to sell pens, it may encounter large economic losses due to the delay. The risk can thereby not be accepted and mitigation measures have to be invested in. Due to the importance of setting guidelines for ALARP, senior managers have to be available and participate in establishing the guidelines and criteria for ALARP (Tummala & Schoenherr, 2011).

Another important part of the risk control phase is to monitor the risks. This stage is important because of the constant changing organizational environment. Conditions changes and some risks increase while other decrease. New risks are constantly arising which force organizations to practice a continuous SCRM process. Risk tolerance and acceptability may also decrease in organizations that decrease costs for mitigation. Therefore, according to Tang (2007), a constant monitoring and assessment of risks should be adopted.

4.3 Critical Success Factors for Risk Management

The concept of CSFs was introduced by Richart (1979) and is defined as a limited number of areas where the results of these areas will create a successful performance of the organization or the organizational process. If the conditions for these areas are inadequate, the organization's performance will suffer. Other authors, such as Boynton & Zmud (1984), continued on the importance of the CSF concept and regarded them as one of few areas that create success for an organization by keeping up performance of an organization's currently active activities. Also, according to (Freund, 1988), CSFs are the most important concept in order to fulfill the organizational objectives. CSFs have been used in different management disciplines such as supply chain management, quality management, project management, manufacturing, etc., since the 1970s (Langhe & Yaraghi, 2009). Different units and activities

in an organization will have different set of CSFs, and it is important to focus on the most relevant CSF s in order to achieve a high level of efficiency and performance. Too many CSFs will also be hard to focus on. The optimal number lies between five and ten (Freund, 1988).

4.3.1 An Overview of the Critical Success Factors

The existing literature that focuses on CSFs has a wide scope, but in the context of risk management, the scope is much narrower. As risk management to a large extent is a generic concept the below stated CSFs can also be applied on supply chain risk management, even if the individual studies are focused on a more general concept of risk management. The table below includes a number of recent papers: Langhe & Yaraghi (2009), Zafar et al., (2011), and Ranong & Phuenngam (2009). All these authors have identified a number of CSFs for risk management. Based on this previous research, the column 'Chosen CSFs', in Table 1 contains relevant CSFs for this thesis.

Table 1: Critical success factors for an efficient risk management process
Source: Own illustration based on the authors in table

Yaraghi and Langhe (2009)	Top Management and Leadership	Communication	Organizational culture	Organizational Structure	Education and Human resources	Documentation
Zafar (2011)	Executive Management Support	Open communication	Organizational maturity		Human resource development	
Ranong and Phuenngam (2009)	Commitment and support from Top Management	Communication	Culture	Organizational Structure	Training	Information Technology
Chosen CSFs	Top Management Commitment	Communication	Culture	Organizational Structure	Education	IT

The authors of the above articles do not always include thorough definitions of the CSFs. but merely include a brief description of the CSFs based on other authors' research. The focus of this review has been to identify articles where the authors have described the most important CSFs for risk management.

4.3.2 Definitions of the Critical Success Factors

The importance and effect of the CSFs included in this thesis are described in this section and are based on articles within the related topics.

Top Management Commitment

According to Zwikael (2008), top management commitment is of a high importance and considered to be one of several CSFs in successful project management. An efficient top management has an important role in an organization's various project scenarios. Top management commitment is often critical for success in developing, initiating and supporting different projects undertaken by an organization. Further, according to Young & Jordan (2008) and Matsuura & Sobel (2012), commitment in an activity or process from top management has an essential role in affecting the success of this activity in the organization, and a crucial part of the success of a project is the top management's commitment in this project. Top management can improve the decision making process or the conditions under which the organization manages risks. A successful risk management process, and hence risk mitigation, is partly dependent on top management support. Galorath (2006) writes that risk management need top management commitment and that top management acknowledges the reality of risks and the organizational commitment to risk management.

All the above mentioned factors describe the need for top management commitment in an organization's risk management process.

Communication

Internal communication in an organization should strive to support the processes and performance of the organization. Communication is accepted as a highly important factor in most organizations. As different employees can have different views on the same issue, based on individual and organizational positions, communication, through discussions or other forms, is important in order to share opinions and under the circumstances, reach the most optimal conclusions (Quirke, 1996).

Communication is important on all levels in an organization. The need for good communication from top management is to set clear and mutual expectations and forward necessary information to fulfill objectives or goals in the organizational or its projects. Adequate communication can also ensure understanding and commitment from organizational members of what is to be achieved and why (Clutterbuck & Hirst, 2002). According to Grabowski & Roberts (1999), communication is an important CSF in in risk management.

This is because; with communication members of the organization can discuss the current state of the organization and different approaches to risk management. An important factor here is the availability of members on a daily basis. A low availability due to meetings, business trips, etc., makes the important part of discussions hard to achieve (Grabowski & Roberts, 1999).

Cultural Aspects

Culture is an important factor in organizations and for the way they perform. According to Hofstede (2001), culture consists of factors such as a shared history, unwritten rules and expectations. These are often not articulated but do always influence the actions of its members. In risk management, which is about solving problems, culture is an important factor for the willingness to learn and communicate within the organization and inter organizationally. The same or similar cultures between people or organizations make communication and knowledge transfer easier. Culture is a collective mindset that separates the members of this group from another group. Culture is shaping behavior the way that skills and attitudes affect thoughts and actions (Hofstede, 2001).

As seen above, culture can both be a positive and a negative factor. As culture affects the mindset of its members it also affects the actions. Some cultures are not optimal for the issues an organization face. This is because it has potential to exclude actions that could be positive for the end result. According to Mosadeghrad (2006), culture has an important effect on the success of an organization or an organizational process. A successful culture should, among several things, include basic factors such as to be open-minded and communicative.

Structure of the Organization

According to Jacobides (2007), the structure of the organization is the base for operational processes and routines. It is comprised of formal lines of communication and authority, including the information that flow along these lines (Stank, et al., 1994).

The structure of an organization can have many different forms depending on the purpose of the organization. The structure divides and allocates different responsibilities for different processes and functions across the whole organization. In this way, it determines which members or employees that get to participate in which decision making process and to what extent their skills and view shape the results and actions of the organization (Jacobides, 2007).

Both the processes and structure of the organization is most efficient when the functions of the organization match the situation of the organization. As organizations are different there is

no optimal structure, but there is a need for the structure to meet the conditions of the environment. As the internal and external conditions for organizations constantly change, the organization must then constantly be reviewed and adapted to the situation (Hunter, 2002).

The description above, points to the importance of the role of the structure in an organization and how it affects performance and its other processes including risk management.

Education

The success of an organization or organizational activity highly depends on the members in the organization. Members should be equipped with proper skills for the task they face (Fill & Mullins, 1990). An efficient risk management requires that the involved personnel are well trained and equipped for their task. This goes for all level of the organization. One way of maintaining trained personnel is to encourage job training through different methods where internal courses are one. Another method is off-the-job training, where personnel educate themselves outside of the organization (Treven, 2003). Education and training strives to improve and maintain skills and attitudes in the organization (Fill & Mullins, 1990).

Education is especially important for members who have been with the organization for a longer time. Although they might have sufficient knowledge about the organization itself, they might be stuck in a certain pattern. This is why education, and also diversity, is important among members. One way of increasing diversity in an organization is to employ people of different educational backgrounds (Argote, 2013).

IT

Mutsaers et al. (1998), states that IT has a key role in the success of an organization´s objectives and that it relates to all business processes. According to Shin (1999), IT can improve information processing, information sharing, organizational responsiveness and the coordination between both inter organizational and intra organizational units. This is because IT facilities the ability to search, to access and to retrieve date immediately.

For efficient risk management, IT is necessary. It is impossible to perform an efficient risk management without efficient IT infrastructure. How his infrastructure should look like differs between organizations and their needs, but it should be able to support the functions mentioned above (Xenomorph, 2013).

According to (Rolland, 2008), IT can be utilized as an important link between risk management and organizational performance. IT tools can be used to gather data and make it

easier for an organization to learn from past events. Although there are many benefits with IT, there are also risk with IT itself, such as security risks because of large amounts of data and information in the same place, which can be sensitive for some organizations.

5. THE SAFs SUPPLY CHAIN RISK MANAGEMENT PROCESS

This chapter presents the result from the documents and interviews at the SAF´s operational department Insatsstaben (INSS), (English: Mission Headquarters), regarding the planning process for PSOs. The information is provided by officers at the sub-department of J4, responsible for operational logistics planning. An overview of the organization with its different departments and key activities will be presented first, followed by the logistics planning process for PSOs. The sub-department of J4 is the main research object, within the SAF, in this thesis. The strong connection J4 has to other departments and functions makes it necessary and natural to include these in this chapter.

5.1 Organizational Structure

The SAF´s headquarters are located in Stockholm, Sweden. It consists of several different departments which all have their own different activities they are responsible for. INSS is the department within the SAF that is responsible for planning of international operations. INSS operates on a strategic and operational level. The operational level is an intermediate link between the strategic and tactical level. Communication with government goes through the strategic level i.e., the operation commander and directives are thereafter sent to the operative level who plan and coordinate specific tasks, which are executed on site by the tactical level. INSS, have an operative function, and is responsible for the planning and coordination of national and international sea, air, and ground military operations. INSS consists of several different sub-departments i.e., J1-J9, which all are responsible for different planning functions related to coordination of international military operations. All sub-departments are directly under orders of the chief department at the strategic level. INSS consists of a strategic and operational level which communicates with, and lies between, the government and the tactical level as illustrated in Figure 6.

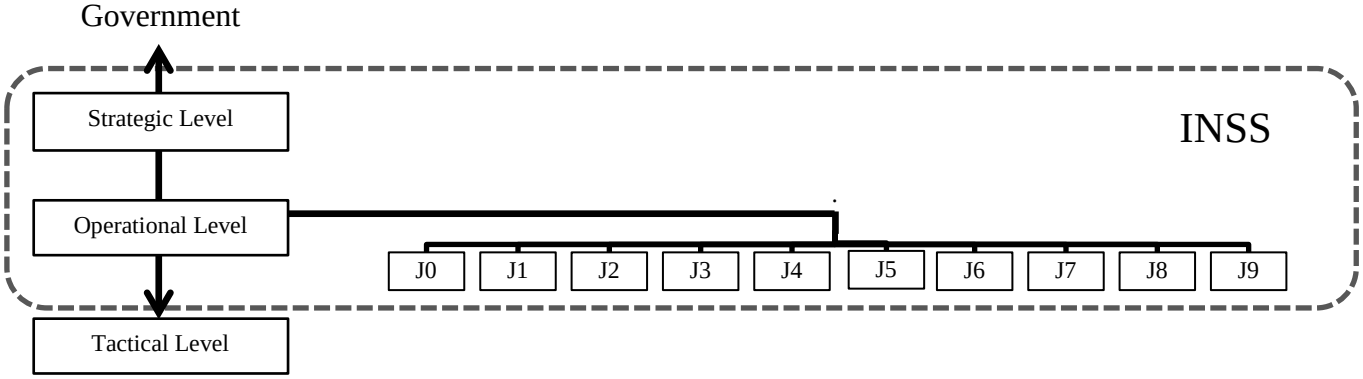

Figure 6: INSS Organizational structure, Source: Own illustration

The communication between the strategic level and the sub-departments on the operational level goes through J5, which is the long term planning department, and has the function of information consolidator in every planning process concerning international PSOs. J5 delegates tasks to the sub-departments based on the governmental directives and requests. These requests, when concerning PSOs, are usually generic and include timeframes, budgets and personnel for an operation. Based on the strategic directives communicated, each sub-department writes an operative plan within its area of expertise. J5 creates a Joint Operational Planning Group (JOPG) for the overall planning process. This is a group with personnel from the different sub-departments where specific function-based information is discussed and synced to write a uniform operative plan. The operative plan is first sent to J5, which combine the information into a complete operation scheme. This scheme is thereafter sent back to the strategic level, which reviews the combined information according to requirements from the government.

5.2 J4 Logistics Organization

J4 is the operational sub-department which is responsible for the logistic and supply chain function. Their main task is the operative logistics and supply chain coordination when INSS plan for a PSO. J4 plan and organize both the logistics preparations before an operation as well as the continuous supply of material to an established operation. J4 is responsible for writing operative plans to set a framework for the tactical levels. An operational plan consists of specifications of type of resources, quantities, routes, authority and timeframes regarding supply for operations. The resources consist of vehicles, petrol, food, water, health care products, ammunition and spare parts. The scale and scope of the required resources all depends on the specific operation. Other factors that are considered in the logistics planning process are infrastructure, construction of basic necessities, and communication elements. J4 is basically providing frameworks of everything that needs to be transported and established at the location of operation in order to support and enable the tactical level to fulfill its objectives at this location. J4 has a close collaboration with the other sub-departments in order to identify the logistic needs, e.g. with J2, the overall security department which helps J4 to plan the logistics from a security perspective.

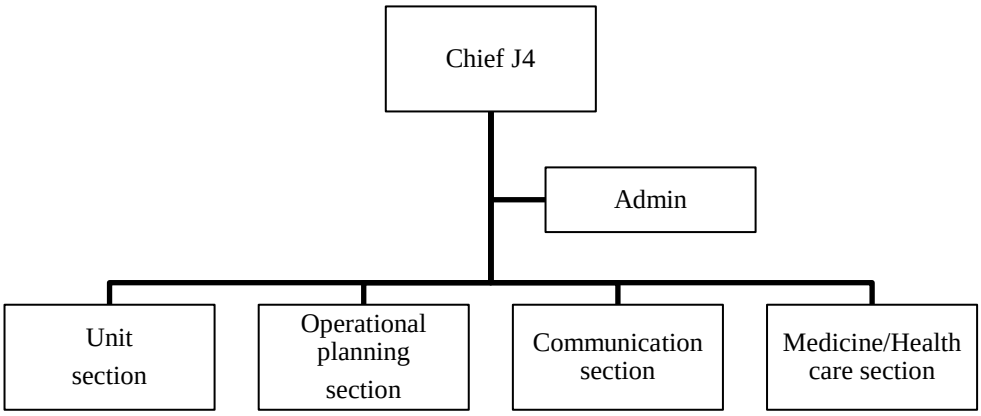

Figure 7: J4 Operational logistics planning sub-department, Source: Own illustration

The medical function contributes with frameworks of how to plan the logistics in relation to decease, food, and other medical fields. The operational planning section plans for operational logistics and camp-infrastructure related to specific resources in order to establish a base and execute military operations. The communication function coordinates strategic and operative transports for PSOs. The unit section is responsible for creating logistics capabilities and the logistics units. The sections above are all involved in the logistics planning of the operation while the tactical levels are the ones that execute it. The communication between the tactical level and J4 is very important for logistics purposes, in the initial establishing phase and the continuous supply of the operation. There is a clear structure for the decision lines and the official information in INSS and J4, but there is a high emphasis on experience and learning-by-doing within the departments, as described further below.

J4 has around 30 employees divided on four main functions, as illustrated in Figure 7. The communication section, responsible for transportation activities, can only be found in J4 among all levels in the SAF. There is no strategic transportation function, no other operational function includes transportation and there is no tactical transportation function. J4 also includes the centralized medical function and the operational planning section responsible for writing and planning the orders and directives for logistics in a PSO.

A common way for advancing in ranks within the SAF is by promotion and internal education. The same goes for the personnel at J4 who, to a large extent, have spent most of their careers, and advanced internally, within the SAF. Most of them came in contact with the SAF in their youth through either conscription or other forms of basic military service, and

then climbed up the organization through different kinds of officer and promotion programs. These promotion programs include logistics, but only as a minor part of the whole education.

The personnel at J4 are a mix of people in terms of ages and background within the military. All the different coat of arms can be found in the personal background of the personnel and most of the personnel have a background in the SAF. Both of the two leading officers perceived that the logistics competence is good at J4 and has a broad scope. Most of the personnel have also spent time on location in various operations to create an understanding of the often complex reality and operational requirements for the lower tactical levels. Learning by doing is a widely used and accepted concept for personnel within the SAF and also J4. But there are opportunities for personnel to educate themselves, away from the job, both within the organization and outside of it. NATO courses, university courses and the previous mentioned promotion courses, constitutes these possibilities.

Personnel that transfer from field service to an upper organizational level does often start with a relatively narrow scope with specific know-how related to the previous occupation, e.g., a marine officer that transfers to J4 is initially only specialized in sea logistics. The scope progressively widens as J4 has a greater overview of the whole logistics operation and again it is primarily based on learning by doing.

5.3 The Planning Process

Today, with the increased focus on internationalization, everything in the SAF strives towards international standards, where NATO is the benchmark organization. There are specific NATO structures and processes to apply on most functions within the military including logistics and SCRM planning. These structures and processes are not applicable to the context of Swedish PSOs, and there are primarily three reasons for this. The organization should be involved from the very first start of a PSO which will provide more time for planning. Sweden is usually not involved in the initial phases of PSOs and has to adapt to already set conditions. The other reason is the limitations in personnel. A NATO department equivalent to INSS involves 650 personnel, while INSS has less than 200 employees, which will further decrease to around 120. Also, NATO standard relies on frequent controls and approvals from superiors while the Swedish tradition is more independent where Swedish superiors are not always present or available. NATO requires the superiors to be present and available at the office more or less the whole time.

Before participating in a PSO, INSS has to plan operations to be as efficient as possible. An overview of the PSO supply chain planning process and the included steps for risk management are illustrated in Figure 8 and further described below. Stage 1-3 describe the process of creating conditions of the PSO supply chain, and stage 4-6 describe the steps for the particular risk management process for the PSO.

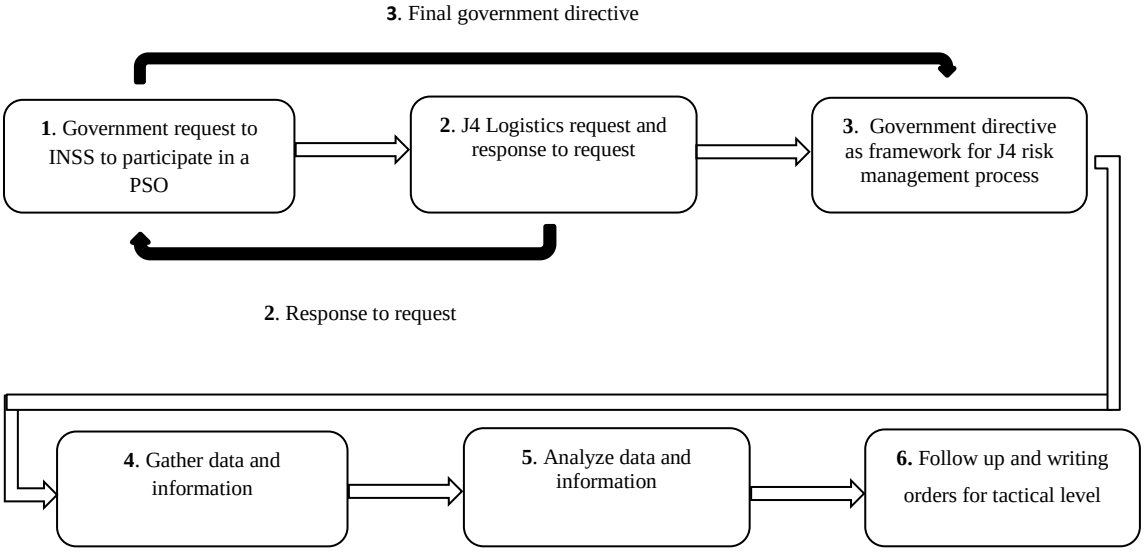

Figure 8: An overview of the planning process, Source: Own illustration

5.3.1 Stage 1, Governmental Request

The planning process starts with a governmental request about the SAF´s ability to participate in a PSO. This request is sent to the strategic division which forwards requests to the operational departments i.e. INSS. The initial information supplied in a request usually only includes requirements of cost and number of personnel. These requirements come from the strategic level based on a political decision or will to participate in a PSO. The cost requirements are also not explicit for the logistics needs and activities, but are included in the overall PSO budget. Information of what kind of personnel the operation will include and the duration of the operation is usually absent in the initial phase. There are no representatives on the strategic level that have logistics skills and logistics background or pure logistics responsibilities. The highest level for logistics activities is the operational level, where J4 is responsible for the operational planning of logistics. The lack of logistics skilled persons at the strategic levels perceived effect among the officers at J4 is that the order and information coming from them lacks in depth regarding logistics. The logistics information and

expectations are very general due to the lack of consideration taken to different factors affecting logistics at the strategic level. According to officers at J4, it results in a level of friction in the communication between the strategic and the operational level because of these unclear directives.

5.3.2 Stage 2, Logistics Request and Response to a Request

The sub-department J5 delegates the directives between all the other sub-departments in INSS through meetings called JOPG. These JOPGs are formed both before new PSOs and during ongoing PSOs. The planning process requires regular meetings by the different members of a JOPG. J4 takes part in these meetings and is tasked with logistics activities such as transport, supply of required resources, infrastructure on location, and other activities related to logistics management. The logistics objectives for a PSO, except to supply units with sufficient resources at location, are not explicitly stated but limited to the personnel and cost requirements. The interviewed officers state that it is more often a personnel requirement than cost requirement.

The timeframes for a response to a governmental request, and the whole planning process, can be short. The shortest one so far was for the operation in Libya in 2012 where J4 had 24 hours to provide an answer on available capabilities for participation. The request came on a Friday and the next day the resources, in this case airplanes and service personnel, where operative. This quick process led to some resource problems related to inadequate fuel on location.

The planning process has a special focus on the transportation of the required resources. Transportation in itself makes up the greatest part of logistics and supply chain cost during an operation, and to find better ways to transport resources from A to B is prioritized. PSO logistics rely heavy on foreign countries logistics capabilities to support Swedish supply chains. An official and preplanned collaboration with the UK for logistics transport is in place. However, much of the logistics collaboration is not always evident in political directives or official protocols but is instead adapted and made up as an operation progresses based on practical needs. Examples of such ad hoc approaches are often seen in operations in collaboration with fellow Nordic countries. Supply chain functions are usually divided between different nations. Planning in collaboration with Nordic countries has in recent years been an up going trend through the Nordic battle group. There is no Swedish methodology for the planning process of various military activities, including logistics, as it used to do. Also,

the whole planning process regarding supply chains and risk management that is applied in the SAF for PSOs, has high emphasis on learning by doing or adapting as you go along.

5.3.3 Stage 3, Governmental Directive

When a request is responded on by INSS, the government mostly listens to the recommendations put forward by J4 about what is possible to contribute with at the time of the request, although some government modification can occur. In any case, a new government directive arrives back to INSS which sets the framework of the actual operation. This directive usually contains more information about the operation such as duration, budget and the number of personnel included in the operation and their respective competences and tasks. With this directive, the planning process goes into a new phase. It is again led by section J5. The main focus of the planning process from J4s perspective is to find out how to best supply and maintain a PSO under the contextual environment (see chapter 3 supply chains in a PSO context).

New governmental directives in general, also during PSOs, can change the logistics conditions for J4. For example, in the before mentioned operation in Libya, new directives decreased the number of airplanes from eight to five, which lead to higher operational costs due to the need for more technicians to keep the airplanes in service. INSS and J4 follow an approach where assigned time is sufficient time, which means that if you have a two days to provide an answer or plan for the operation you do this in two days. It is not suitable to question orders from higher levels. Short timeframes related to the new directives often make it hard to talk to all the required personnel and find relevant facts about the situation and operation. It is accepted that all the resources cannot be utilized in such a quick process, and the result is largely experience based and the quality dependent on the individual or individuals that are accessible. Previous operations can be used as a guide for logistics activities when planning new operations by remembering how similar operations in terms of location and scale where conducted and what kind of logistics resources they required. This is because the storage of logistics data and information from previous operations is close to non-existent. There is no kind of supporting computer system with databases containing data and information and tools for calculations, forecasts and efficient communication with other sections or functions within or outside the SAF that are or can be used in the planning process. Instead, most of the information is based on experience, previous knowledge and contacting the right individuals at the right time. This is something that is adopted through the whole planning process. The quality of the information is very dependent on access to specific

personnel and the personnel assigned to find it. The praxis is to go talk to colleagues or go through old documents. In the optimal case these documents are sorted in a folder, but in most cases they are not. This way of working is perceived as time consuming to form good operational plans. There are no standard routines, procedures, economic values or sets of equipment ready to apply in new PSOs.

5.3.4 Stage 4, Gather Data and Information

When the governmental directives are reviewed, the conditions for the operation are set and the last actions are taken to prepare for the PSO. J4 takes part in a reconnaissance group sent by INSS to the area of operation. A reconnaissance group is sent to the PSO area to gather information about possibilities and threats in the location. This is an essential part of the planning process. The group usually consists of personnel with multiple capabilities from different sections in INSS and they try to cover every aspect that is seen as important in the particular PSO. J4´s responsibilities are the logistics aspects, and investigate areas such as; is it possible to use this airstrip or do we have to use a different approach? How do we solve ground transportation from A to B after a flight? How developed is the local infrastructure i.e. hospitals and roads, and where can we keep inventory safe? There are strategic limitations to the number of personnel that can participate in a reconnaissance group. Usually these groups include personnel with logistics skills and responsibilities. But occasionally, there are only a limited amount of participants allowed on a trip which force the group to prioritize some functions and neglect other. An example is that medical personnel, which are regarded as very important in a reconnaissance group, will have to act as logisticians and perform the tasks related to the logistics reconnaissance as well. A reconnaissance trip is a routine activity in the planning of an operation, but the scale of the trip is highly dependent on the specific operation. In highly complex and new environments more than one trip can occur. INSS also has a minimalistic view on the reconnaissance trip, which means that only the most necessary personnel is sent and all sections in INSS have to share the available slots. It is a combination of the specific need and the, at the time, available resources in terms of strategic personnel limitations, while budget constraints is secondary in this context.

To get as much information about the location for an operation as possible, the capabilities of the military intelligence service (MUST) are used frequently. MUST have people specialized in various capabilities and are able to support J4 by providing information affecting logistics.

5.3.5 Stage 5, Analyze Data and Information

The information from the reconnaissance trip and the intelligence information from MUST are combined with, and contribute to, a general risk analysis performed before and during an operation. This risk analysis is not focused only on logistics or supply chain activities but on the operation as a whole. This is because of the many complex and interrelated factors affecting both operational logistics and other operational activities. J4 contributes to this analysis if needed, and use the results in their planning. The personnel conducting this analysis are not necessarily those who gathered the information, or later make logistics or supply chain decisions. The head officers at J4, responsible for analyzing the logistics situation, are also not educated in the specific risk analysis process. The connection J4 has to this process is that they supply information related to logistics, and use the results related to other functions to support logistics activities. In this risk analysis, a two dimensional risk matrix is used based on probability and consequence, where the results are categorized in level of severity. An example of how the risk analysis can affect the logistics during an ongoing operation is in Afghanistan, where it was concluded that the vehicle park had to be upgraded due to changes in the conflict situation. This led to a different logistics i.e. a need to transport a new kind of vehicle, and to plan the supply for a new set of spare parts and services.

Communication between personnel and sub-departments is identified by the officers in the interview as very important part of the PSO planning process. Although, a number of frictions related to communication in the daily activities where mentioned during the interviews. There are often too many things going on simultaneously at INSS and J4. This creates a situation where personnel usually have multiple tasks parallel to each other. The current reorganization contributes to this situation, but budget limitations create this reality even without the reorganization. Also, personnel are often away on different trips, such as reconnaissance trips, education purposes, and meetings or other. A normal working group such as a JOPG has the task to identify, analyze or write orders. The group usually consists of 5-10 people. This makes it hard to gather all required personnel at one specific time, and to discuss or do certain tasks. Usually less people than the desired number for a complete result take part in a meeting. The need to prioritize is emphasized as very important and also frequent in the daily activities.

All the information gathered in the different parts of the planning process so far is ultimately analyzed by the two interviewed officers at J4. When needed, they collaborate with connected and relevant functions and sections within INSS and J4 through a JOPG.

5.3.6 Stage 6, Follow Up and Writing Orders for Tactical Level

When J4 has made decisions regarding logistics, they write one or several orders for the tactical level to execute. The experience of the interviewed officers is that, everything which is obvious for personnel writing orders at an operational level is not obvious for personnel executing orders at the tactical level. In order to minimize friction in communication and to facilitate for an efficient conduction and to avoid confusion, J4 arrange meetings with the lower tactical level to ensure that they comprehend the plan, and is able to execute it accordingly. Otherwise, the experience is that different tactical officers can have different ideas of what they are supposed to do with their allocated resources. Another friction in communication and control with the tactical division during an operation is the high personnel turnover on location during a PSO. This leads to large and immediate drops in on-site knowledge. 100% of the personnel are replaced at the same time, usually every six months, and the new ones have to adjust to the routines, which can be a process that creates communication friction and demand fluctuations.

The general risk analysis performed by INSS is conducted every six months to update the security situation. This is done even more often if there is a major change in the operational environment that requires a new analysis. The new analysis helps J4 to follow up on developments and changes in the environment. However, J4 is most often forced to take a reactive approach to risk control. Orders from the government can change rapidly and J4 cannot assume that a developed framework can be used on a routine basis. Follow ups are usually conducted ad hoc or not possible at all, due to the changing directives and short timeframes of operations. Also, as previously mentioned, J4 experience some communication bottlenecks due to the lack in logistic competences on the strategic level. This hinders J4 from conducting an efficient risk control approach.

6. ANALYSIS AND DISCUSSION

The chapter will analyze INSS´S supply chain risk management process from a theoretical framework, containing the underlying conditions for this process, constituted by a number of critical success factors. These CSFs for risk management are important to create good conditions for an efficient SCRM process. As explained in this thesis, the context of military supply chains is important to consider when using commercial theory as an analytical base. This chapter will compare J4´s organizational conditions for SCRM process with those proposed in theory, i.e. the CSFs. Thereafter, the SCRM process of J4 will be analyzed from the one described in theory. The discussion will concern J4´s SCRM process based on their current organizational conditions.

6.1 Analysis of the Critical Success Factors

The different CSFs are analyzed below where INSS organization is put in relation to the CSFs. The comparison reveals a number of gaps between theory and actual conditions in the INSS´s organization.

6.1.1Top Management Commitment

The importance of top management commitment is stated by Zwikael (2008) who says that it is of a high importance in project management. Further, Galorath (2006) says that a successful risk management process is dependent on top management support. Also that it requires top level management to acknowledge the reality of risks and the organizational commitment to risk management. The top management level in the INSS is the strategic level, which lacks representatives with logistics skills, logistics backgrounds, or pure logistics responsibilities. The level where logistic decisions are taken is J4 in the operational level. This leads to a situation where directives and information coming from the strategic level lacks in depth for the specifics regarding logistics. This can be interpreted as that the acknowledgement of risks and risk management is not fully realized. It is argued that lack of support may be due to underestimation of the importance of lower level activities, or a lack in capabilities and education. In this case a combination of the two is likely since better education would create higher understanding of logistics, and the current lack of logistics educated personnel fosters an underestimation of the importance of logistic activities in PSOs. Also, as logistics, historically and present, is not a core activity for the SAF it can be seen as something of relatively less importance.

The logistics information sent between the strategic- and operational level are very general, because of a lack of strategic consideration for different factors affecting logistics at the top

management level. Young & Jordan (2008) and Matsuura & Sobel (2012) state that commitment and support in an activity or process from top management has an essential role in affecting the success of this activity in the organization. Top management commitment is often critical for success in both developing, initiating and supporting different projects undertaken by an organization, including risk management, and according to Young & Jordan (2008) top management can improve the processes or the conditions for these organizational processes. There is a clear lack in top management support for the SCRM process in INSS and J4. The lack of consideration to logistics needs, which affects the information flow, and the lack of a logistics responsible person, makes the SCRM process and its conditions harder. According to J4, the lack in top management support affects the results of the SCRM process. This is especially related to the initial phase regarding the governmental request. Which is severe since the initial phase is the base for the rest of the process, and poor information at this stage can create a less than optimal starting point for the following parts of the process. The lack of information regarding vital factors, such as what kind of competences that should be utilized and the operational objectives, does not only rely on the logistic competence at strategic level. If strategic personnel receive very general information about a participation in a PSO from the government, their ability to provide additional details to the operational level is also limited. Although, a logistics responsible person at the strategic level could potentially better identify the information needed for the future logistics activities and hence improve conditions and the SCRM process.

As discussed above, there are some inconsistencies between the theoretical propositions presented about top management commitment, and the experienced top management commitment in the SCRM process conducted by J4. Top management commitment shapes and supports the work for lower organizational levels. There is also a lack in top management commitment in the SCRM process, as discussed above. J4 also express inefficiencies in the SCRM process due to the lack in logistic competence on the strategic level. These three factors combined point to the gap in INSS´s organization to create conditions for the SCRM process.

6.1.2 Education

The competence level at J4 is perceived by the leading officers to be sufficient and with a representation from all the different coat of arms. The fact that most personnel have spent time in PSOs in various ways is seen as a strengthening factor for their competences and ability to understand the context of military logistics, and the operational requirements for the

lower tactical levels. Fill & Mullins (1990) states that organizational personnel should be equipped with proper skills for the tasks they face and it is perceived among the leading officers that this is the case. If looking beyond the view regarding J4, held by its leading officers, some factors can be identified that are open for further discussion. Even if personnel have the correct skills, it does little good if these are not utilized when needed. Medical personnel sometimes have logistics responsibilities during reconnaissance trips, as a direct result of the personnel restrictions and minimalistic view on these reconnaissance trips. This can have a direct impact on the quality of the results.

The personnel at the strategic level do not have any proper education or skills within logistics and far less so in risk management regarding logistics. The current task of the strategic management does not involve logistics activities or SCRM activities, and since they are not faced with these activities the need for logistics skills should not be present. However, as mentioned in the section about top management commitment in this chapter, this lack of logistics skills at the strategic level is not an optimal setting for the SCRM process. The personnel at this level do not have the proper education or skills for a more optimal/efficient SCRM process. The other aspect is that the personnel involved in the SCRM process tend to be recruited internally, partly due to cultural reasons discussed in the following section about cultural aspects. According to Argote (2013) this creates a good knowledge and understanding of the organization itself but can hinder the organization or process to adapt new methods since personnel is too involved in the current organizational perspective. The level of organizational knowledge is undeniably very important for the complex reality of PSOs, which strengthens the incentives for the standard procedure to recruit internally. Education is available for personnel at J4, such as NATO and university courses related to logistics. Although, learning by doing was a recurring concept during the interviews, and a very common way to develop skills and knowledge within INSS and J4. Thus, most of the personnel related to J4 have spent majority of their careers in the SAF. This facilitates the need to understand the organization and its environment when conducting various activities related to the SCRM process. However, it does not allow for a higher level of knowledge influences from external perspectives. It can be argued that the strong praxis of learning by doing, even though its benefits mentioned above, can be questioned and not optimal for risk management from a theoretical perspective. This since external influences on education can enhance an organization's knowledge base (Treven, 2003). As mentioned, both the learning by doing and internal recruitment approach provides and understanding of the complexities of

the military supply chain and is a product of the operational environment, as mentioned. Also, since there are possibilities for personnel at J4 to acquire knowledge both externally and internally, which according to theory are two important components for successful risk management, this leads us to the conclusion that J4 have a for good approach to the success factor education. However, personnel constraints do sometimes lead to lack in correct personnel utilization in the SCRM process.

6.1.3 Cultural Aspects

There are some factors in this research that can be connected to organizational culture that can be argued to affects the SCRM process. First, J4´s approach that 'assigned time is sufficient time' is connected to their organizational culture that it is not suitable in the SAF to question orders. This can have an impact on the SCRM process, especially when the time frames for planning and decisions are short, as they often are. A successful culture should be open-minded and communicative, according to Mosadeghrad (2006). If the need for additional time, used to produce better information, is not communicated to higher level management, it can be argued that it is an inappropriate cultural expression that hinders the efficiency of the SCRM process. Especially the current time limitations have negative impacts on the utilization of available resources. Also, J4 accepts that all the resources cannot be utilized in every process and that the result is largely experience based. The quality is thereby dependent on the individual or individuals that are accessible. The above discussion points in the opposite direction of an open-minded culture that lacks the ability to fully communicate its needs for sufficient and necessary resources for an efficient SCRM process. It is also possible that the organizational culture prioritize other activities, than logistics, higher. This is strengthened by the fact that there is no logistician on the strategic top management level. Of course the reality of decision making in a military context says that not all directives and timeframes can be questioned, if any. But as most of these directives are set by political will, which can change rapidly, it would not be fully improbable to suggest that there could be some level of negotiation regarding the time frame for a SCRM process. This is especially if the benefit of more time is clearly stated to the decision makers. More time is highly relevant in the initial request phase which is usually very short.

Hofstede (2001) says that culture is shaping behavior the way that skills and attitudes affect thoughts and actions and that it consists of factors such as a shared history, unwritten rules and expectations, which are often not articulated, but influence the actions of its members. The same or similar cultures between people or organizations make communication and

knowledge transfer easier. The strong connection the personnel have to the organization, by internal recruiting and spending most of their careers in the SAF creates a foundation for a strong organizational culture. It can be argued that SAFs strong organizational culture creates strong bonds and strengthen the existing organizational internal behavior. However, when personnel to such a high degree grow within the organization, exposure to new influences are automatically reduced which can constrain innovative thinking.

6.1.4 Communication

Communication within organizations is a critical factor to a successful business operation. Internal communication, both within a single unit and in the frame of the whole supply chain, is important in order to share opinions and reach optimal conclusions (Quirke, 1996). J4 operates in an organizational constellation that is based on specialization and collaboration. Each sub-department focuses on specific tasks of an operational plan which combined constitute the complete PSO scheme for the INSS department. J4 and the other sub-departments communicate with each other through formal JOPG meetings. This structure is aligned with the theory, which states that formulated communication routines through e.g. meetings are important to share information and discuss different approaches to risk management (Grabowski & Roberts, 1999).

Although, a number of frictions related to communication were mentioned during the interviews. It was stated that personnel in the sub-departments usually have multiple tasks parallel to each other, and key personnel are often away on different trips which makes it hard to find opportunities to gather for JOPG meetings. According to Grabowski & Roberts (1999), communication reveals an organization's current state in a process and that it is important with input from different competences for efficient planning and improvement. Usually, less people than desired, for an optimal result, take part in JOPG meetings. One officer stated that if he only gets five minutes with a colleague in the hallway then its best to make as much as possible of those five minutes since everyone is busy. An important factor in this context is the availability of members on a daily basis. A low availability, due to the fact that personnel is often away on meetings, business trips, etc. makes important parts of discussions hard to achieve and the result incomplete. J4 adapts to budget and personnel constraints set by higher management which ultimately affect the quality of the JOPG meetings.

J4 do communicate with the strategic level and the tactical level. Continuous updates and inputs from these levels are crucial for J4 in order to provide their part of the operational plan. Clutterbuck & Hirst (2002), states that communication is important on all levels in an organization. The need for good communication from top management is needed to set clear directives and expectations. Adequate communication can ensure understanding and commitment from organizational members of what is to be achieved and why (Clutterbuck & Hirst, 2002). J4 experience frictions related to the communication with the strategic level since there are no personnel with logistic knowledge on this level, further discussed in section 6.1.1 about top management commitment. The logistics communication with the lower tactical level is better since J4 request tactical officers to contribute with feedback on the written order to minimize communication gaps.

J4 do possess formulated communication routines and fixed meetings where information is shared. However, as discussed above, the reality presents frictions related to limited availability of personnel which is not optimal for the risk management process. This is due to the limited budget and lack of key personnel at the operational and strategic level. J4 has to take both the strategic and operational responsibility for the logistics which lead to a greater workload. It can be argued that all these factors contribute to the communication constraints which affect the quality of JOPG meetings. Necessary information to fulfill objectives or goals is important to receive as fast as possible due to the short timeframes of operations. Communication upheld on a regular basis supports accurate decision making and can enhance the supply chain risk management process due to the increased information sharing and planning abilities.

6.1.5 Organizational Structure

Jacobides (2007) argues that the structure of the organization is the base for operational processes. Stank, et al. (1994) argues that the organizational structure is comprised of formal lines of communication and authority including the information along these lines. The organizational structure of INSS consists of clear formal lines of communication and clear structural authority where different sub-departments have their specific responsibilities. Authority is strengthened by the hierarchical structure of the organization where strategic level is the top level authority. According to Jacobides (2007), the organizational structure divides and allocates different responsibilities for different processes and functions across the whole organization. This way it determines what personnel that participates in which decision

making process and to what extent their skills shape the results and actions of the organization.

Hunter (2002) states that both the processes and structure of the organization is most efficient when organizational functions match the organizational situation. There is no best way an organization should be structured, but there is a need for the structure to meet the conditions of the environment and to constantly be reviewed and adapted to the environment. When the external environment changes INSS have the possibility to make organizational changes through different JOPG constellations. Since these JOPGs are directly connected to the planning for PSOs, they are vital part to the SCRM process. This aspect of the organizational structure provides a high level of flexibility where constellations of the working groups are adapted to the challenges in the external environment. However, there is no such flexibility on the strategic level and the mentioned lack of a strategic logistics responsibility create additional workload for J4, and force them to focus on non-core activities by taking on a strategic responsibility. It can thereby be argued that the horizontal structure of the organization at the operational level does not constitute any major limitations to an efficient SCRM process. However, the vertical structure of the whole organization, with an emphasis on limitations at the strategic level, affects the activities for the rest of the organization. Even though the horizontal structure creates good conditions for the SCRM process, J4 cannot fully utilize this structure, due to mainly personnel constraints, which with the current reorganization, will increase even more.

6.1.6 IT

IT has a key role in the success of an organization's objectives and that it relates to all business processes according to Mutsaers (1998). According to Shin (1999), IT systems can improve information processing, information sharing, organizational responsiveness, and the coordination between both inter organizational and intra organizational units. This is because IT facilities the ability to search, to access, and to retrieve data immediately. When planning logistics for a PSO, J4 base decisions, to a large extent, on experience and previous operations. However, the whole organization lacks sufficient systems to store information that can be accessed at any time. Instead of computer systems containing all previous hard values, information is stored physically or sometimes not stored at all. J4 experience that the lack of computer databases restricts their ability to conduct forecasts. It also affects their ability to conduct efficient communication with other sections or functions within, or outside, the INSS

that are or can be used in the planning process. Rolland (2008), underlines the importance of IT in this context, where it can be utilized as an important factor to execute risk management for an enhanced organizational performance. Collecting and storing information in databases creates greater possibilities to learn from past events. How this type of databases and information systems should be structured is organization specific depending on the organizational context (Xenomorph, 2013). In relation to this, a PSO supply chain can contain a vast number of products ranging from complex fighter jets to drinking water and base camp services, in both medical and technical fields (Skoglund & Dorn, 2008). J4 needs to consider a large number of hard values when planning the logistics aspects in terms of location and what kind of logistics resources that is required. The quality of this information is very dependent on access to specific personnel and the personnel assigned to find it, which by J4 is perceived to be time consuming when producing good operational plans.

The benefits of IT, and the lack of a current IT system to utilize in new PSOs, strengthen the need to introduce a functional information system supporting the SCRM planning process. Even though there are many benefits with IT, there are also risks with keeping large databases. Large amounts of sensitive and classified information stored in the same place can jeopardize the organizations security (Rolland, 2008). According to J4, military information can be sensitive from a national security perspective and information must be protected from external actors.

The lack of a sufficient IT system within INSS presents challenges in their planning, which affects the SCRM process. J4 has to be economically viable due to the economic limitations. They are at the same time not able to base all decisions on hard values since there is no well-established database. Also, information must at the same time be protected from external actors. An information system which registers economic values, and information about logistics needs in previous operations, connected to specific material and product requirements for operations, would help tremendously in the logistic planning and budgeting process. Systems to track products could also help to plan efficient inventory management at operations with continuous supply requirements. In support to this, input systems where fuel, food and water demand from previous operations can be kept by simply typing in the consumption at every operation. It is argued that this could simplify the forecasting process and decrease supply and demand fluctuations by improving communication in the organization.

6.2 Analysis of the SCRM Process

This section analyzes J4´s SCRM process in comparison with the corresponding SCRM process described in the theoretical framework and connects it to the theoretical CSFs. Tummala & Schoenherr (2011) and Waters (2007), states that organizations should implement a proactive SCRM process in a systematic way for a successful risk management, here presented as a generic three step process; risk identification, risk analysis and risk control. There is no official methodology or planning process for J4 to follow when working with SCRM in PSOs, although there is not a complete lack of SCRM in PSOs. What follows below is a number of activities taking place before and during a PSO that relates to SCRM, but these activities are often integrated with other activities and not explicitly focused on SCRM.

6.2.1 Risk Identification

Risk identification is the first step in a SCRM process and the key activity which the subsequent of analysis and control activities are based on (Waters, 2007). A number of activities are conducted to complete this first step and to identify unexpected factors that occurs and has a negative impact on operational supply chains (Walker et al., 2003). J4 conduct risk identification through JOPG meetings with other INSS sub-departments, MUST and also through reconnaissance trips to the PSO location. Waters (2007) says that risk identification should not solely rely on individual knowledge and informal procedures, since it can affect the scale and scope of the identified risks. In relation to this, J4´s existing risk identification relies highly on the access to right people and their personal knowledge. The results are therefore largely experience based and dependent on the individuals that are accessible. It can affect the quality of risk identification. This is connected to the less than desired number of participants in JOPG meetings and to the reconnaissance teams, which sometimes lack personnel with specific logistic knowledge, i.e. medics are at times obliged to take logistics tasks.

Tummala & Schoenherr (2011) state that risk identification needs a structured and comprehensive approach to identify potential supply chain risks. Also, the supply chain risk variety, interrelationship and relationship with other parts of an organization, are important to understand. J4 reach this understanding through the collaboration and meetings with other sub-departments, mainly through JOPGs. These JOPGs strengthens the understanding of the different environment aspects and provide a holistic image of the potential risks to the supply chain. This is because the different sub-departments provide inputs on the different aspects of

the PSO. The theoretical propositions of the risk identification described above, align to some extent with J4s reality. A formal process for risk identification exists, although its level of execution can be discussed from a CSF perspective.

It is argued that the risk identification step can be connected, mainly, to the discussions in the analysis of the CSFs; Education, Organizational structure, Communication, and IT. A clear organizational structure is well established at INSS, where conditions for good communication and risk identification are present. Different risk factors can be considered in the identification process based on the different sub-departments specific inputs at the JOPG meetings. However, communication is at times, not as formal and sufficient as wanted due to short timeframes, budget constraints and shortage in personnel. In stressful situations, informal communication has to be conducted, e.g. discussions in corridors instead of at the JOPG meetings. To invest more resources in actually gathering for fixed meetings, and really utilize these possibilities created by the existing structure are recommended. Again, J4 have economic limitations which truly require a better internal resource allocation where they can choose to put resources on the most important SCRM activities such as risk identification. A computer system which registers flows connected to specific material and product requirements for operations would help tremendously in logistics planning and resource allocation. Systems to track products could also help to plan efficient inventory management in operations with continuous supply requirements. This would simplify the forecasting process and help the organization to be more economically efficient and utilize resources better. Risks connected to e.g. inventory deficits can thereby be better identified.

6.2.2 Risk Analysis

The general risk analysis performed by INSS does not isolate supply chain risks, but focus on risks related to the PSO as a whole. This is because of the many complex and interrelated factors affecting both logistics and other operational activities. Although, this can have the effect that the general risk analysis for the PSO lacks in analytical consideration for supply chain activities. J4 has the responsibility to analyze the risks in PSOs that are connected to logistics and the supply chain as a part of the whole PSO. All the gathered information from the identification step is analyzed by the two leading officers at J4 and if necessary, in collaboration with other departments through the JOPGs. The approach of collaboration in the analysis is strengthened by Tummala & Schoenherr (2011) who states that focus groups or other expert meetings are a potential source for a successful analysis based on their skills.

Regardless of the method used for risk analysis, it is highly important to separate risks from each other and prioritize the important ones in order to achieve organizational and economic efficiency in SCRM (Tummala & Schoenherr, 2011). For this Norrman & Lindroth (2004) propose a simple but efficient risk analysis method based on a two dimensional risk matrix that includes probability and consequence where the results are categorized according to the level of severity. INSS use a similar risk matrix in their general risk analysis which provides a base for prioritizing risks in PSOs. However, the risks are not specifically categorized from a supply chain context perspective. This can be related to that the head officers at J4, responsible for analyzing the logistics situation, are also not educated in the specific risk analysis process. Also, the personnel conducting this analysis are not necessarily those who gathered the information that is the base for this analysis.

According to Waters (2007) risk consequences in terms of financial asset loss is useful among organizations to define economic impact. This is not done in the risk analysis and we argue that a systematic approach to this is necessary due to their increased economic limitations. This approach can support the organization´s economic efficiency and allow them to allocate existing resources better. To personnel that work close to the risk analysis must have a suitable knowledge and education in this type of activity and resource has to be allocated to this. (Tummala & Schoenherr, 2011) states that the probability assessment part of the analysis can be performed quantitatively, but requires sufficient data of historical events. The lack of a sufficient IT system limits the possibility to assess the risks this way. Also this assessment approach typically yields better results in more stable environments when the PSO environment is highly unstable. Quantitative assessments yield better results in more unstable environments which also are in line with the current risk analysis, even though its shortcomings discussed above.

The process for risk analysis exists but its execution can be discussed from a CSF perspective. It is argued that the two relevant CSFs in the risk analysis context are education and IT. As stated above, the risk analysis process for J4 does not isolate and analyze supply chain risks separately. Knowledge connected to this is not sufficient enough and specific analysis on supply chain risks could have been better analyzed if logistic personnel close to the planning process are more available. Also, right personnel at the right place can help J4 to translate risks and consequences to hard values which can help them in the risk analysis. Support for this can be created by employing logistics educated personnel closer to the risk analysis. The

personnel should be equipped with proper skills for the tasks they face according to Fill & Mullins (1990). The lack of sufficient IT systems also affects this process in terms of storing hard values as a base for analyzing the needs and situation in the initiation phase of new PSOs.

6.2.3 Risk Control

According to Waters (2007) the activity of risk control following the risk analysis is about designing an appropriate response, which means to decide under the circumstances best way to mitigate and monitor the identified and analyzed risks. J4 is most often forced to take a reactive approach to risk control. This is due to the fact that orders from the government can change rapidly depending on the constant changing environment and the grade of involvement in a PSO. J4 cannot assume that a developed mitigation framework based on risk identification and analysis can be used on a routine basis. Follow ups are usually conducted ad hoc due to the changing directives and short timeframes of operations. This is unlike a commercial organization, which have clear supply and demand pattern where the route of the supply chain can be displayed clearly and explained as a regular flow where risk mitigation in the chain can be established according to routines and patterns within the chain.

Tang (2007) argues that a constant monitoring of risks should be adopted and organizations should practice a continuous risk control because conditions in the environment changes and new risks are constantly arising. Shahriari (2011) states that risk control depends on the organizations risk perception which differs between people and organizations. People in organizations face decisions every day, and if risk wouldn't be accepted at all, no decisions would ever be made. Due to the highly complex environment in PSOs, J4 perform a risk analysis on a regular basis but the constant changes in objectives create a situation where the risk mitigation and monitoring cannot always be performed as wished. Because of this the risk tolerance has to be at a high level. The possibility to control risks through demand risk management described by Tang (2007) based on forecasts and inventory management also face problems due to the lack of a supporting IT system and because of the uncertainty around operational demands since there is a complete turnover of personnel every six months.

The risk control part is the step with the most challenges for an optimal conduction according to SCRM process theory. It is mainly the context of the PSO that sets the limits in risk control

for J4 as discussed above. But for a more efficient risk control we argue for a higher focus on the CSFs IT and Communication as discussed above.

6.3 Summary and Recommendation

The SCRM process conducted by J4 in collaboration with other sections and departments practice the same steps as theory suggests. But the conduction of these steps is not always optimal in relation to SCRM process and CSF theory. All the different CSFs are important to consider executing risk management and this section provides our recommendations related to each CSF for a more successful SCRM process for J4.

Education

The organization possesses a high competence level and deep knowledge related to several areas. However, appropriately educated personnel in the specific field of logistics need to participate in the identification of risks. Right personnel at the right place can help to analyze and translate risks to hard values and thereby enhance the risk analysis process.

Communication

The need for better communication goes through the whole process and more resources put into actually gathering for fixed JOPG meetings and really utilize these possibilities created by the existing structure are recommended.

IT

The organization has a broad competence level amongst the personnel. The SCRM process for PSOs, work sufficiently in the way that PSO are functional. However, a sufficient IT system, which they currently lack, would simplify all the steps in the SCRM process by helping the organization to be more economically efficient and utilize resources better by basing decisions on historical and hard values. Implementation of such system should be highly prioritized in order to enhance and improve activities related to logistics and SCRM.

Organizational Structure

There is a clear and established organizational structure at INSS where conditions for good communication SCRM are present. But the resource constraints in forms of personnel and economic means do not allow for an optimal utilization of the existing structure i.e. it is

mainly factors related to the organizational structure, rather than the organizational structure itself that affects the SCRM process.

Cultural Aspects

The SAF has a strong culture which benefits the organization in many ways such the distinctiveness of structure and clear roles. However, this creates some identified challenges such as reluctance to question directives and asking for longer timeframes. This is also strengthened by the dominant focus of internal recruiting. More external influences through external recruitment could create a more open culture and allow for more discussion, questioning ad development of the current SCRM process.

Top Management Commitment

Information from the strategic level sets the foundation for the SCRM process and needs to be correctly transferred down to the lower levels. Lack in personnel with logistic skills on this level may affect the speed and accuracy of important information flow affecting logistics in the whole SCRM process which is why it is argued that top management commitment is of very high importance.

7. CONCLUSION

This chapter starts with a brief summary of the thesis. Followed by a section that concludes the research findings and present the connection to the purpose and the answers to the specific research questions. The last part presents our contribution and suggestion for further research.

7.1 Thesis Summary

The goal of this research is to identify room for improvement within the SAF´s SCRM process which is conducted by J4, a sub-department of INSS. The need for further development of their SCRM was identified by previous research conducted by FOI. The analysis in this thesis is based on a literature review on commercial SCRM and the empirical data from the SAFs operational logistics department J4 as a case study. These two parts is supported by a description of the context of supply chains in PSOs (chapter 3). The literature review provides two main theoretical perspectives important for SCRM. These are the critical success factors which are organizational conditions affecting risk management and a SCRM process containing a number of important steps for risk management. The empirical result consists of secondary data and interviews with leading officers at J4 and describes the whole PSO planning process for SAF. From the analysis we can conclude that J4 suffer from organizational inefficiencies connected to the SCRM process and the conditions behind it. We suggest that development and improvement of the SCRM process can be reached through improving the CSFs which are implemented on an organizational level and affect the success of the SCRM process.

7.2 Concluding the Research Questions

The purpose of this thesis is to identify SAF´s approach to SCRM for PSOs and analyze this from a commercial SCRM theory perspective. This is fulfilled in the answered and concluded research questions below.

Sub-question 1: *What are the conditions for, and how is the SAF´s SCRM process organized and conducted for PSOs?*

The SAFs SCRM process is not clearly expressed by the organization, but it contains a number of steps which are revealed by in the empirical result. The process is based on governmental and strategic level directives. They start the process with risk identification through reconnaissance trips. Thereafter, leading officers at J4 analyze the risks to implement suitable control measures and the risk control is done by recurring, planned follow-ups if

necessary. The whole SCRM process is formed around continuous JOPG meetings where different sub-departments provide different inputs and aspects of the operation. The conditions for this SCRM process are based on the context of the PSO and also the internal organization of SAF. These are usually short time frames, personnel and economic limitations which affect the availability of necessary personnel and quality of the JOPGs and their results. Other limitations are created by internal bottlenecks in the organization such as lack of a sufficient information base due to non-existing IT systems for SCRM support. Also, a lack of logistic personnel on the strategic level creates constraints in the logistics communication and information flow between the strategic and operational level.

Sub-question 2: *What does commercial theory say about efficient organizational SCRM processes and conditions to conduct these?*

The theory reviewed in this thesis point to six different critical success factors important for an efficient organizational risk management. These are not limited to any specific type of organization or risk management situation. The factors are IT, Communication, Education, Organizational structure, Culture and Top management commitment. Also, theory suggests a generic SCRM process containing the three steps of risk identification, risk analysis and risk control. To be able to perform these risk management steps efficiently the organization is dependent on the critical success factors.

Main research question: *If and if so, how can the SAF´s SCRM process for PSOs be improved by commercial SCRM theory?*

There is room for development of the SAFs SCRM process just as Ternblad & Salomonsson (2013) previously identified in their research on military logistics. We argue for a number of suggestions based on the gaps which are identified in the analysis by comparing the SAF's organization and SCRM process with the corresponding concepts identified in theory. These suggestions are related to implementation and improvements of important aspects gained from the CSF theory. Assigning personnel educated in logistics at the right place in the SCRM process can enhance the risk analysis process for the SAF. Lack in personnel with logistic skills on the strategic level affects the speed and accuracy of the logistics information flow in the whole SCRM process which is why this is this is of high importance. Also, actually gathering for fixed meetings and really utilize the possibilities created by the existing

organizational structure is recommended. The suggestion to implement a sufficient IT system is of high importance and would simplify all the steps in the SCRM process by helping the organization to be more economically efficient and utilize resources better. Further on, resource constraints in forms of personnel and economic means does not allow for an optimal utilization of the existing structure. Lastly, external influences through more external recruitment will create a more open-minded culture and allow for more discussion and questioning around the current SCRM process. Improving and focusing on these suggestions will enhance the whole SCRM process and help the SAF to meet the demands of economic efficiency and resource utilization.

7.3 Contribution and Further Research

Foremost this thesis contributes to the development of the SAF´s SCRM process in PSOs. Related to the academic field, this research contributes as a framework for combining these two theoretical aspects in a case study for development of SCRM.

This thesis strengthens previous research that shows a need for development in the SAFs SCRM. This is done by identifying a number of areas in the SAF´s SCRM process inconsistent with an efficient SCRM process according to theory. The suggested areas for improvement provide a base for further research. Important areas to further investigate are how the tactical and strategic levels are affected by our suggestions of improvements in the operational level. Case studies in these areas could provide a holistic picture of all the interrelated factors in the SAF´s organization from top to bottom.

Also, from the literature review we conclude that there is a lack of scale in articles addressing CSFs, specifically for SCRM. We recommend that this is further developed to enable an even stronger connection to CSFs in future research.

References

Argote, L., 2013. *Organizational learning, Creating, Retaining and Transferring Knowledge.* 2nd ed. s.l.:Springer.

Bellamy, A. J., Williams, P. D. & Griffin, S., 2010. *Understanding Peacekeeping.* 2nd ed. Cambridge: Polity Press.

Boynton, A. C. & Zmud, R. W., 1984. An Assessment of Critical Success Factors. *Sloan Management Review,* 25(4), pp. 17-27.

Clutterbuck, D. & Hirst, S., 2002. Leadership communication: A status report. *Journal of Communication Management,* 6(4), pp. 351-354.

Collis J & Hussey, R., 2009. *Business research-A practical guide for undergraduate and postgraduate students.* Third edition ed. s.l.:Palgrave Macmillan.

Crockford, N., 1986. *An Introduction to Risk Management.* 2nd ed ed. s.l.:Woodhead-Faulkner.

Dorn, M., 2009. *Logistikledning: En studie om effektiviering av försörjningskedjan: FoT-område Logistik,* Stockholm: Försvarshögskolan.

Easterby-Smith, M., Thorpe, R. & Jackson, P., 2008. *Management Research.* 3rd ed. London: Sage.

Eisenhardt, K. M., 1989. Building Theories from Case Study Research. *Academy of management Review,* 14(4), pp. 532-550.

Ekström, T, 2004. *Supply Chain Management: En evolution inom den civila logistiken, men en revolution inom den militära logistiken? ,* Stockholm: FOI.

Fidel, R., 2009. *The Case Study Method: A Case study,* Seattle: Graduate School of Library and Information Science, University of Washington.

Fill, C. & Mullins, L., 1990. The effective Management of Training. *Industrial Commercial Training,* 22(1), pp. 13-16.

FMV, 2012. *Logistiktrented inom omvärlden,* s.l.: Försvarets materialverk.

FOI, 2013. *www.foi.se/sv/foi/om-foi/.* [Online].

Ford, D. et al., 2003. *Managing Business Relationships.* 2nd ed. Chichester: John Wiley and Sons Ltd.

Foxton, P. D., 1994. *Powering War: Modern Land Force Logistics.* London: Brassery's Ltd.

Freund, Y. P., 1988. Planner's guide Critical Success Factors. *Planning Review,* 16(4), pp. 20-23.

Försvarsdepartementet, 1996a. *Krigets Lagar.* 2.1 ed. Stockholm: Fritzes.

Försvarsdepartementet, 2009. *Regeringens proposition 2008/09:140: Ett användbart försvar.*, Stockholm: Regeringen.

Försvarsmakten, 1997. *Joint Military Doctrine: Peace Support Operations,* Stockholm: Försvarsmakten.

Galorath, D., 2006. *Risk Management Success Factors,* s.l.: World Today.

Grabowski, M. & Roberts, K., 1999. Risk Mitigation in Virtual Organizations. *Organizational Science,* 10(6), pp. 704-722.

Halinen, A. & Törnroos, J.-Å., 2005. Using case methods in the study of contemporary business networks. *Journal of Business Research,* 58(9), pp. 1279-1285.

Hofstede, G., 2001. *Value and Culture, Culture's consequences.* London: Sage Publication.

Hunter, J., 2002. Improving organizational performance through the use of effective elements of organizational structure. *International Journal of Health Care Quality Assurance incorporating Leadership in Health Services,* 15(3), pp. XII-XXI.

Husdal, J., 2005. *Vulnerability of road networks in a cost benefit perspective,* Washington DC, USA: transport research board annual meeting.

IlaManuj & Mentzer, J. T., 2008. Global supply chain risk management. *Journal of Business Logistics*, Volume 29, pp. 133-55.

Iwan Vanany, S. Z. N. P., 2009. Supply Chain Risk Management, Literature Review and Future Research. *Journal of Information Systems and Supply Chain Management,* Volume 2(1), 16-33.

Jacobides, M. G., 2007. The inherent limits of organizational structure and the unfulfilled roleof hierarchy: Lessons from a near-war. *Organizational Science,* 18(3), pp. 455-477.

Jakobsen, P. V., 2006. *Nordic Approaches to Peace Operations.* Abingdon: Routhledge.

Jankowicz, A. D., 2005. *Business Research Projects.* 4th ed. London: Business Press Thomson Learning.

Juttner, U., 2005. Supply chain risk management Understanding the business requirements from a practitioner perspective. *The International Journal of Logistics ,* Volume Vol. 16 No. 1.

Kartal, B., 2012. *The selection of global supply chain risk management strategies by.* Turkey, Celal Bayar University, Manisa 45030 TURKEY.

Kress, M., 2002. *Operational Logistics: The Art and Science of Sustaining Military Operations.* Dordrecht: Kluwer Academic Publishers.

Langhe, R. G. & Yaraghi, N., 2009. Critical Success Factors for Risk Management Systems. *Journal of Risk Research,* 14(5), pp. 551-581.

Lind, F. et al., 2010. *Framtida logistikedning*, s.l.: FOI.

Lindström, G., 2007. *Enter the EU Battlegroups.*, s.l.: Chaillot Paper.

Lysons, K. & Farrington, B., 2006. *Purchasing and Supply Chain Management.* Hants: Ashford Colour Press.

Maklan, U. J. a. S., 2011. Supply chain resilience in the global financial crisis: an empirical study. *Supply Chain Management: An International Journal*, p. 246–259.

Matsuura, Y. & Sobel, P., 2012. Using the whole mind for risk management. *Internal Auditor,* 69(2), pp. 25-27.

Mentzer, J. T. et al., 2001. Defining Supply Chian Management. *Journal of business logistics,* 22(2), pp. 1-25.

MIL-STD-882C, M. S., 1993. *System Hazard Analysis, System Safety Program Requirements,* USA: United States Department of Defense.

Mosadeghrad, A., 2006. The impact of organizational culture on the successful implementation of total quality management. *The TQM Magazine,* 18(6), pp. 606-625.

Mutsaers, E. J., Zee, H. & Giertz, H., 1998. The Evolution of iInformation Technology. *Information Mangagement and Computer Security*, 6(3), pp. 115-126.

Norrman, A. & Jansson, U., 2004. Ericsson's proactive supply chain risk management approach after a serious sub-supplier accident. *International Journal of Physical Distribution & Logistics Management*, 34 (5).

Norrman, A. & Lindroth, R., 2004. *Categorization of supply chain risk and risk management.* England: Ashgate Publishing Company.

Ohlson, T., 2008. Understanding Causes of War and Peace. *European Journal of International Relations,* 14(1), pp. 133-160.

Pagonis, W. G. & Cruikshank, J. L., 1992. Moving mountains: lessons in leadership and logistics from the Gulf War. In: s.l.:Harvard Business School Press, p. 210.

Quirke, B., 1996. Putting communication on management's Agenda. *Journal of Communication Management*, 1(1), pp. 67-79.

Ranong, P. N. & Phuenngam, W., 2009. *Critical Success Factors for Effecitve Risk Management Procedures in Financial Industries.* Umeå, Umeå University.

Richart, J. F., 1979. Chief executives define their own data needs. *Harvard Business Review,* 57(2), pp. 81-93.

Rolland, H., 2008. *Using IT to drive effective risk management.* [Online]
Available at: www.rmmagazine.com
[Accessed March 2013].

Russel, R. & Taylor, B., 2001. *Operations Management.* 3rd ed. Upper Saddle River, New Jersey: Prentice Hall.

Saunders, M., Lewis, P. & Thornhill, A., 2012. *Research Methods for Business Students.* 6th ed. Edinburgh: Pearson Education Limited.

Shahriari, M., 2011. *Loss prevention and safety, a practical risk management handbook.* Gothenburg: Chalmers university of Technology.

Shahriari, M., 2011. *Loss prevention and safety, a practical risk management handbook.* Gothenburg: Chalmers university of Technology.

Shahriari, M., 2011. *Loss prevention and safety, a practical risk management handbook.* Gothenburg: Chalmers university of Technology.

Shin, N., 1999. Does Information Technology Improve Coordination? An Empirical Analysis. *Logistics Information Management,* 12(1), pp. 138-144.

Sjöstrand, C., 2007. *Swedish international forces in the service of peace : international missions undertaken by the Swedish Armed Forces.*. Malmö: Bokförlaget.

Skoglund, P., 2012. *Sourcing decisions for military logistics in Peace Support Operations: A case study of the Swedish armed forces,* Jönköping: JIBS.

Skoglund, P. & Dorn, M., 2008. *What is Military Logistics? Paper presented at the Military Logistics Symposium 2008,* Stockholm: s.n.

Stake, R. E., 1995. *The Art of Case Study Reserach.* Thousand Oaks: Sage Publications.

Stank, T. P., Gustin, C. M. & Daugherty, P. J., 1994. Organizational Structure: Influence on Logistics Integration, Costs, and Information System Performance. *The International Journal of Logistics Management,* 5(2), pp. 41-52.

Susan L, G. D. F., 2012. implementing mixed methods research in supply chain management. *international journal of physisical distribution & logistics management,* Volume 42.

Tang, C. S., 2005. Perspectives in supply chain risk management. *Int. J. Production Economics,* Volume 103, p. 451–488.

Tang, C. S., 2007. Robust strategies for mitigating supply chain disruptions. *International Journal of Logistics,* Volume 9, pp. 33-45.

Ternblad, S. & Salomonsson, G., 2013. *Kartläggning av civil logistikforskning,* s.l.: FOI.

The Swedish Armed Forces, 2006c. *The Swedish International Forces in the Service of Peace – The Swedish Armed Forces' International Missions (Utlandsstyrkan i fredens tjänst – Försvarsmaktens internationella insatser).*. Malmö: Bokförlaget Arena.

Tillberg, P., Svartheden, J. & Engstedt, D. J., 2007. *Mission Abroad – Military examples from international missions (Uppdrag utland – Militära exempel från internationella uppdrag).* Stockholm: Försvarshögskolan.

Treven, S., 2003. International training: the training of managers for assignment abroad. *Education + Training,* 45(8), pp. 550-557.

Tummala, Rao, C, R. & M.Yam, 2003. A risk-based maintenance management model for toll road/tunnel operations. *Construction Management and Economics,* Volume 21, pp. 495-510.

Tummala, R. & Mak, C. L., 2001. A Risk Management Model for Improving Operation and Maintenance Activities in Electricity Transmission Networks Author. *The Journal of the Operational Research Society,* Vol. 52(, No. 2), pp. 125-134.

Tummala, R., Nkasu, M. & Chuah, K. B., 1994. A Framework for Project Risk Management. *ME Research Bulletin,* Volume 2, pp. 145-71.

Tummala, R. & Schoenherr, T., 2011. Assessing and managing risks using the Supply Chain Risk Management Process (SCRMP). *Supply Chain Management: An International Journal,* p. 474–483.

UN, 2008b. *United Nations Peacekeeping Operations: Principles and Guidelines.*, New York: s.n.

Walker, H., Brenchley, R. & Harland, C., 2003. Risk in Supply Networks. *Journal in Purchasing and Supply Management,* 9(2), pp. 51-62.

Vanany, I., Zailani, S. & Pujawan, M., 2009. Supply Chain Risk Management, Literature Review and Future Research. *Journal of Information Systems and Supply Chain Management,* Volume 2(1), 16-33.

Waters, D., 2007. *Supply chain risk management, vulnerability and resilience in logistics.* London and Philadelphia: Kogan page limited.

Weick, K. E., 1969. *The Social Psychology of Organizing.* 1st ed. Reading: Addison-Wesley.

Vilko, J., 2012. *Approaches to supply chain risk management: Identification, Analysis and Control,* Finland: Lappeenranta University.

Vissak, T., 2010. Recommendations for Using Case Study Method in International Business Research. *The Qualitative Report,* 15(2), pp. 370-380.

Woodhouse, T. & Ramsbotham, O., 2000. *Peacekeeping and Conflict Resolution.* Abingdon: Cass Publishers.

Voss, C., Tsikriktsis, N. & Frohlich, M., 2002. Case Research in Operations Management. *International Journal of Operations and Production Management,* 22(2), pp. 195-219.

Xenomorph, 2013. *Xenomorph analythics and data management.* [Online]
Available at: www.xenomorph.com
[Accessed March 2013].

Yin, R. K., 2003. *Case Study Reserach, Design and Methods.* 3rd ed. Thousand Oaks: Sage Publications.

Yin, R. K., 2009. *Case Study Research: Design and Method.* 4th ed. London: Sage.

Young, R. & Jordan, E., 2008. Top Managment Support: Mantra or necessity?. *International Journal of Project Management,* 26(7), pp. 713-725.

Zafar, H., Clark, J. G., Ko, M. & Au, A. Y., 2011. *Critical Succes Factors for an Effective Security Risk Management Program: An Exploratory Study at a Fortune 500 term.* s.l., AMCIS Proceedings.

Zsidisin, 2003. Managerial perceptions of supply risk. *Journal of Supply Chain Management,* Volume 39, pp. 14-25.

Zsidisin, A. G. & Ritchie, B., 2008. *Supply chain risk: A Handbook of Assessment, Management and Performance.* New York: Springer Science+Business Media, LLC.

Zsidsin, G. A., 2005. The Dark Side of Supply Chain Management. *Supply Chain Management Review,* March(1).

Zwikael, O., 2008. Top management involvement in project management A cross country study of the software industry. *International Journal of Managing Projects in Business,* 1(4), pp. 498-511.

APPENDIX

Interview Guide for Semi-Structured Interviews

1) What is the goal of your logistics and supply chain management? (Efficiency in costs / time functionality/safety/ What incentives?)

2) Who decides what to do? Are there conflicts related to these activities, unclear goals?

3) What external threats do you see related to the supply chain in PSOs?

4) How do you work to identify these? (SCRM process/ Organisation behind?)

- Who does this? (People) Which department?
- What is their training?
- What kind of resources is devoted to this, limitations??
- Will the location for the operation be visited before an operation begins?
- What do you find out during a field visit? Why / why not?
- Is it the same people who go and who decide?

5) How do you determine which threats are relevant and needed to slow down to maintain an effective and efficient chain?

- Who does this? (People) Which department?
- What is their training?
- What kind of resources are devoted to this?

6) What are you doing to mitigate these?

- How are you developing strategies?

7) How do you maintain this long term

- Who does this? (People) Which department?
- What is their training?
- What kind of resources is devoted to this?

7) Do you use a standardized SCRM process before each operation?

8) Evaluation after operations and follow up?

9) How is the logistics responsibility divided between organizational levels?