A Form to Collect Incident Reports: Learning From Incidents in the Swedish Armed Forces

Ulrica Pettersson
Lund University Centre for Risk Assessment and Management (LUCRAM), Lund University
Sweden
ulrica.pettersson@fhs.se

Abstract: In the modern business environment a greater number of organizations act worldwide and regularly meet with new cultures and environments. The change calls for a more rapid learning process than previously, in order to adjust to new situations. In order to prevent incidents from recurring, organizations put effort into collecting information after incidents. Learning from experience is often associated with incidents and accidents, however it can also concern positive occurrence. The purpose of the collection is to explore knowledge, analyse what happened and find the root-cause (basic contributions facts and circumstantial conditions) of the incident. If the root-cause is found, the organisation has possibilities to make changes in order to avoid similar incidents and to respond to crises. The collection is regularly done through pre-printed forms, but the reports are seldom sufficient as they often tend to lack vital information. We state, the answers in incident reports are closely related to the form design and the questions arising in the form. To improve the collection method, we designed a structured incident reporting form, using interview and questionnaire research and focused on the aim of the information collection. Our new form was compared to the unstructured form (at present used in the Swedish Armed Forces and NATO) in two experiments. Forty participants from the Swedish National Defence College were recruited to watch film sequences displaying incidents, and in the time that followed report and describe the incident they had observed in writing. The new structured form led to significantly improved results in both experiments. Structured incident reports, with a focus on the customers' requests, appear to significantly improve after incident reporting. As incident reports become more complete, analysts have an enhanced possibility to find the basic contributing factors and circumstances and there will be a better possibility to learn in the organization and to avoid similar incidents in the future.

Keywords: incident report, experience-based, data collection, incident, acquiring knowledge

1. Introduction

In the modern global environment, many armed forces operate in unfamiliar environments, facing new tasks and responsibilities. This necessitates a greater ability to identify and implement improvements more rapidly than before (US Army 2009, NATO 2010). Nonaka (1994) stresses that those organizations which deal with changing environments, ought to collect, process and create knowledge frequently. According to Simon (1991), individuals learning in an organization are dependent on what others already know and if the information is present for others in the environment. In other words, there is a huge need in the armed forces, as well in as most organizations, to explore knowledge, improve and actually learn from earlier experience.

In the aftermath of most incidents, there are normally a number of questions raised. For example: *What happened*, *Why did it happen* and, *How can we act to avoid it happening in the future?* One way to acquire information on incidents is to use pre-printed forms. In numerous organisations, incident-forms (paper or digital) are provided to all personnel, in order to be used in a learning process. Unfortunately, a serious weakness in several organizations seems to be that numerous experiences are poorly or not reported at all (Dekker 2007, US Army 2009, Pettersson & Nyce 2011). US Army also claims that despite high speed techniques and excellent storage possibilities, units often fail to preserve records of their mission tasks (US Army 2009). To succeed in reaching the entire loop in the lessons learned process, organizations need to collect accurate knowledge regularly. At the Centre for Army Lessons Learned (CALL) one of the most important mission statements is that collection of knowledge/unit operational data and the collection process in the US Army is a pronounced commander's responsibility (Chua, Lam & Majid 2006, US Army 2009).

Results from an earlier study (Pettersson 2010), using an incident reporting form (currently used in the Swedish Armed Forces (SwAF) and NATO) to collect experience from international missions among Swedish officers, confirmed that reports are often poorly written. In view of the fact that acquired reports often lack vital information or are incomplete, 'raw', we assume a few overarching headings are not sufficient for the observer to write a clear and mature report.

Reference this paper as: Pettersson, U. "A Form to Collect Incident Reports: Learning From Incidents in the Swedish Armed Forces" *The Electronic Journal of Knowledge Management* Volume 11 Issue 2 (pp150-157) available online at www.ejkm.com

In NATO's LL process there is an articulated distinction between raw observation and mature observation: *Raw observation: an observation which requires further study or analysis to fully understand the root causes.*

Mature observation: an observation for which there is already sufficient data and/or understanding to identify the root causes and thus requires no further analysis. (NATO BI-SC 2007, p. (2-1)).

Given these poor results, one can speculate if the method used in the incident reporting process does in fact fit its purpose. Why do the reports not hold the information required? Our paper is concerned with whether incident report forms can be improved, in order to guide the observer to share his or her knowledge and experience to the analysts. If reports can become more mature, containing more complete and accurate information, analysts might be able to find the root cause and in the long run the organisation will have a better chance to learn, improve and by that reduce friction (von Thaden & Wiegmann 2004). The experimental idea was to compare two different incident report forms, the unstructured form at present used in the SwAF and NATO with our new redesigned, more structured form. Is it possible that participants using the new form, which aims to guide the writer through the reporting process, produce more mature experience reports, compared with participants using SwAF's and NATO's unstructured form?

1.1 Knowledge required in Armed Forces

The customer of the incident report process, in this case analysts at the SwAF headquarters, can request reports from a specific unit or domain, so called top-down driven reporting. On the other hand the report process might be initiated by the individuals working in the field, bottom-up driven reporting. In either of the scenarios, analysts or other receivers of the report look forward to finding certain specific information in the report. Incidents reported in the SwAF cover a wide aspect of incidents; from e.g. vehicle accidents, shooting accidents. Other reports cover non-functional/inefficient equipment such as car tires, uniforms or tents.. Some reports cover human aspects e.g. weak leadership, unclear orders etc. There is no clear definition on what an incident is and what should be reported. Consequently, all personnel have to decide if events should be reported or not. The situation can be one explanation as to why the report number is low.

The minimum information CALL desires from an observation is administrative, such as instance contact information, operation and location, followed by an observation title. They also need background information, including relevant items. Insight is also required into what happened, under what conditions, how the unit was affected and why, and finally, what should be learned by the event (US Army 2009).

At NATO's lessons learned centre one determines if a report is mature by first of all distinguishing if it contains any causes (why) of the incident occurrence, and if the explanation seems to be correct, and secondly by distinguishing if the report contains a recommendation (solution), and whether this recommendation seems to address the cause. Summarized, the report should be credible, logically convincing and easy to read (NATO 2010, NATO BI-SC 2007). Almost every report has to be further analyzed, but it will make it easier for the analysts if the reports are as mature as possible when they are written and posted from the mission area.

2. Collection of incident reports

According to Reason (1997) there are two important mechanisms in handling error management: error *reduction,* where one tries to avoid and prevent errors from occurring, and error *containment,* where one strives towards limiting severe consequences when errors do occur. In both cases data collection is needed, but we will emphasise that organisations should not complete the collection so as to search for 'scapegoats' or blame individuals (Reason 1997, Dekker 2007, Pettersson & Nyce 2011). Management has an enormous responsibility to create a culture in which everyone actually *wants* and especially *dares* to report their errors and near-misses (Reason 1997, Dekker 2007, Pettersson & Nyce 2011). Collection of data regarding incident must be carefully organized, as the answers one will receive depend heavily upon what is asked (Andersson 2007).

2.1 Interview and questionnaires

Data collection can be completed using a number of different methods. It is important to choose a method which will serve the collection purpose and is suitable in the actual context. Interview research can be divided into verbal interviews and written questionnaires (Christensen 2007, Andersson 2007). Normally interviews take more recourse but the method is especially useful when one wants to collect deeper knowledge and

penetrate into a certain topic. Questionnaires or forms can be easily and widely distributed, but seldom collect the same level of detailed knowledge.

During the design process of a questionnaire, one must carefully analyze what the questionnaire is supposed to reveal and what the researcher or analyst wants to know (Christensen 2007). Compared to interviews, there will be no opportunity to explain the questions or to clarify the answers. Nor will there be opportunities to compose supplementary questions (Andersson 2007), which is the case during verbal interviews (digital questionnaires manage to create predefined supplementary questions to some extent). During verbal interviews, pauses and encouragement can be used; this is not practicable using questionnaires. A rigid design and questions in fixed order are often called structured interviews and is often a feature of questionnaires. During interviews it is easier to adjust the order of the questions and be more flexible, which gives the opportunity to be less structured (Andersson 2007).

An interview is called structured when the questions are highly concentrated around a specific slim topic and the researcher already knows what he/she wants to ask about. In this case, unstructured will reflect an interview over a much wider topic (Trost 1994). An uncomplicated introduction that catches the respondent's attention might facilitate getting started and feeling comfortable, so consider the questions position carefully. "Use simple words- avoid acronyms, abbreviations, jargon and technical terms or else explain them" (Oppenheim, 2005, p 129). All questions should be clear, easy to understand and possible to answer. Be aware that the total length must not be repellant and avoid leading questions (Synodions 2003). Respondent's interest seems to weaken after a certain time (Trost 1994, Christensen 2007). Questions should thereby be limited to what the respondents are expected to have knowledge about. To predict the future or answer hypothetical questions is extremely difficult and those questions must be very well-considered (Synodions 2003).

Open-ended questions allow the informants to answer in any way they please. Meanwhile closed-ended questions require them to choose from a limited number of alternative answers (Christensen 2007). Using open-ended answers is normally more burdensome to answer and requires extra analysis, although might be preferred when one cannot define well known variables. Do not squeeze several questions into one. Rather divide them into several sub questions (Trost 1994, Synodions 2003). Seek to attain perfection with questions that flow logically, more general to more specific, least sensitive to more sensitive (Synodions 2003). Expression, vocabulary and phrases must be known to the informant so there is no misunderstanding regarding the questions (Trost 1994). To give the informant examples can be fruitful, but should be considered carefully in each case (Andersson 2007). In contrast to interviews, questionnaires do not provide the opportunity to ask additional questions (except in some digital forms). Using open-ended answers or at least providing empty space for supplementary information might help to capture 'deeper' knowledge. A high quality questionnaire demands a lot of planning and design. It must be tailor-made for its specific purpose, audience and the culture it is supposed to work in (Synodions 2003).

2.2 Consideration in design of a form

Dekker (2007) claims there are two major things to handle in the reporting process. The forms should be accessible for all personal, regardless of rank or title; they must not be troublesome to fill in or to forward to analysts in the learning cycle. According to Reason (1997) format, length and content of the reporting form are central matters in reporting. The reporting form must not be too long or require too much time to complete. If so, the respondent might not complete the task. On the other hand, if the form is too short, analysts will not get hold of what really happened. A solution should hit upon a suitable balance between time and effort for the reporter and the total content on behalf of the analysts. Direct questions are easy to complete. On the contrary, only using direct questions might restrict the reporter's story, because some 'things' were not queried. Open-ended questions or free text fields take longer to complete but tend to gather additional information. It is also normally more time consuming to analyze open questions (Reason 1997, Andersson 2007).

SwAF's LL-process can be divided into six phases (fig. 1), where the process starts with *observation* and ends with *follow up*. Our study focuses on the first parts of the process and explores the encircled steps: *observation*, *collection* and, briefly, *analysis* (HQ 2008).

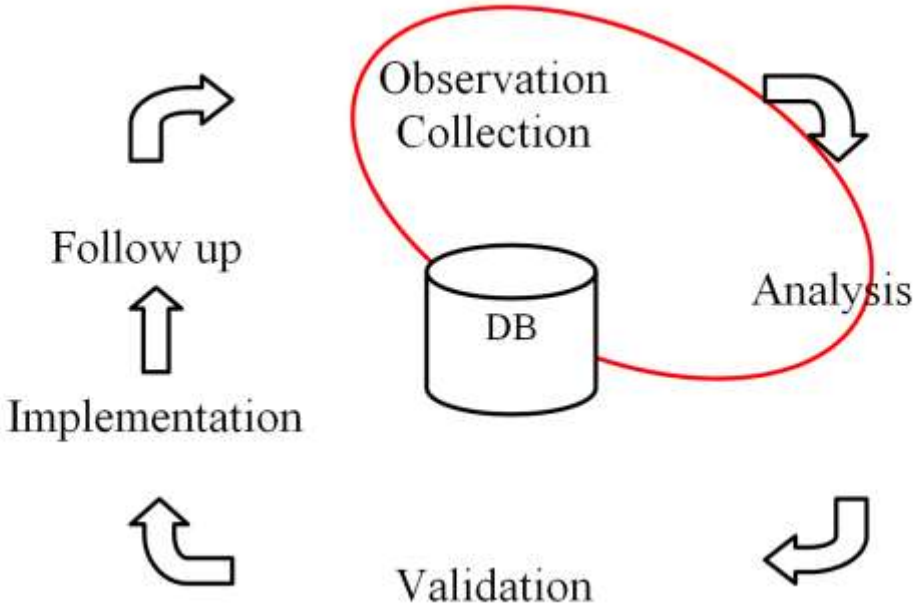

Figure 1: The Swedish Armed Forces Lessons Learned Process (SwAF HQ 2008)

To describe the encircled steps in figure 1 in more detail, the reporter (officer/civilian) first observes an incident and decides if it is worth reporting. If so, they will make a brief analysis of what happened and write a report about the incident. In a second stage the incident report will later be read, interpreted and more deeply analyzed by an analyst. Now we will turn the encircled steps around and view the process from a customer perspective, starting with the product, and see the observer at the other end. The customer is represented by the people gathering information for different purposes, e.g. analysts, lessons learn division or management. From this point of view we can visualise step by step how the customer can support the process and offer the observer suitable tools in which he or she will be able to deliver a report containing the knowledge required.

2.3 Form construction

Our form is designed to be rather general, to fit a wide range of incidents. The form is structured; all headings follow a fixed order and under every heading there are sub-questions. Several examples are provided to guide the respondent. Furthermore, the form has an uncomplicated layout; it contains less than half a side of A4 of questions (incomplete). Terminology was chosen which aims to be understandable for the average respondent. However, Oppenheim (2005) argues "We must always bear in mind that difficulties that respondents may have in understanding the question and in forming an 'inner picture' of their own answer or reaction..." will affect the answer (Oppenheim, 2005, p. 121). The form's questions are based upon analysis of what information NATO and CALL require after an incident.
The new form differs from the old in the following aspects:

- The heading *Observation* was increased with a request to describe the incident as detailed as possible.
- Heading *Discussion* was changed to *Facts*. In addition three sub-questions were asked, with proposals (cues) on potential answers to help respondents.
- *Who were the main actors/components? (describe them in detail)*
- *In what context did the incident occur? (e.g. environment, climate, weather, °F/°C)*
- *When did the incident occur? (e.g. dd/mm/yyyy, hh:mm)*
- The heading *Complementary Information* was added. In addition two sub-questions were asked, with proposals on potential answers to help respondents.
- *Were there any previous areas/issues, that might have affected the incident?*

- *Are there other vital areas/issues of interest or uncertainty, related to this observation?*

3. Method

In our study we conducted two experiments, where two different incident report forms (independent variable) were compared. In the first experiment all participants watched the same film sequence (incident). In the second experiment, ten altered film sequences (incidents) were used to approximate the situation where different participants reported their own story. The second experiment was conducted to test the structured form's generality; that results were valid for a range of incidents.

3.1 Procedure

A total of 40 participants were recruited from the Swedish National Defence College (SNDC), 23 female and 17 male all of them undergraduate students of political science. The participants were randomised into four equal sized groups; A.1, A.2, B.1 and B.2. In compensation for their time and effort they received two cinema tickets each.

First, the participants signed an informed consent. Secondly, they were given written instructions to watch one randomized film sequence. Finally, they were given additional written instruction to describe the incident they had observed, in an electronic MS Word form. The film sequences were approximately 6 - 8 minutes and contained one incident each. Total experimental time was limited to 30 minutes. Our ten film sequences were chosen from nine drama and youth feature films; the Horse Whisperer (I), Defiance (II), Private Ryan (III), Thelma and Louise (IV), Top Gun (V), Young Guns 1 (VI), Young Guns 2 (VII), Madicken på Junibacken [Swedish movie] (VIII), Skrållan, Ruskprick och Knorrhane [Swedish movie] (IX), Nya hyss av Emil i Lönneberga [Swedish movie] (X).

The study was divided into two parts; experiment 1 and experiment 2. In experiment 1, all the participants in groups A.1 and A.2 were shown one identical film sequence displaying one incident, although group A.1 reported in the structured *form* and group A.2 reported in the unstructured *form*. In experiment 2, the same procedure was carried out in groups B.1 and B.2 although in this part, ten altered film sequences displaying one incident, were shown to both groups. Group B.1 reported in the structured *form* and group B.2 reported in the unstructured *form* (see Table 1).

Table 1: Experiment design experiment 1; group A.1 and group A.2. experiment 2; group B.1 and B.2

	Structured form	Unstructured form
1 film sequence	Group A.1	Group A.2
10 film sequences	Group B.1	Group B.2

The structured form consists of 'topic' and five main headings: 'observation', 'facts', 'conclusion', 'recommendation' and 'supplementary information'. A total of nine sub-questions are inserted under the main headings: What happened (describe your observation in as much detail as possible), Who were the main actors/components (describe them in detail), Where did the incident occur (e.g. country, city, area/region, organization), In what context did the incident occur (e.g. environment, climate, weather, °F/°C), When did the incident occur (e.g. dd/mm/yyyy, hh:mm), What could be possible reasons for this incident, What should be done to avoid/decrease, this kind of incident in the future, Were there any previous areas/issues, that might have affected the incident, Are there other vital areas/issues of interest or uncertainty in relation to this observation? *The unstructured form* consists of 'topic' and four main headings: 'observation', 'discussion', 'conclusion' and 'recommendation', and no options were given to leave additional or supplementary information.

3.2 Evaluation

The participant's reports were evaluated individually by two civilians (political scientists) at SNDC, one female one male. Both used master reports as keys, which were created in consultation with an analyst from the SwAF intelligence service. Eight categories (variables) were evaluated: (a) Does the report describe the incident? Does the report give a clear picture of (b) the main actors/components in the incident, (c) where the incident

occurred, (d) when the incident occurred, the (e) context/environment, (f) why the incident occurred? Does the report contain information about (g) previous issues/matters that might have affected the incident? Does the report describe a (h) useful/reasonable recommendation on how to avoid a similar incident in the future? All eight categories could achieve 0-6 points; maximum for each report was 48 points.

4. Results

Experiment 1:

In our first experiment the results turned out as we expected; group A.1, using the structured *form,* performed considerably better than group A.2, using the unstructured *form* (see Table 2). Variables (c), (d), (e) and (total) were significantly enhanced. Variables (a), (b), (f), (g) and (h) were modestly improved although no significant effects were found. Mean figures of both graders were used as foundation in the t-test. Inter-rater reliability calculated on variable (total) was good, r = 0,894472.

Table 2: Results from t-tests between groups in experiment 1: Mean 1 = unstructured form, mean 2 = structured form. Variables: (c) where did the incident occur, (d) when did the incident occur, (e) in what context or environment did the incident occur and (total) sum of all eight variables

Varia.	Mean 1	Mean 2	t-value	df	p
(c)	1,60	4,70	-5,00	18	0,00
(d)	1,35	3,30	-2,60	18	0,01
(e)	3,20	5,10	-3,64	18	0,00
(total)	16,97	26,67	-4,13	18	0,00

Experiment 2:

In our second experiment, where we used ten randomized film sequences, the result did not differ appreciably from experiment 1, except that variable (g) also was significantly enhanced. There was no obvious variation between the randomized film sequences. Inter-rater reliability calculated on variable (total) was good, r = 0,950537.

Table 3: Results from t-tests between groups in experiment 2: Mean 1 = unstructured form, mean 2 = structured form. Variables: (c) where did the incident occur, (d) when did the incident occur, (e) in what context or environment did the incident occur, (g) previous issues/matters that might have affected the incident and (total) sum of all eight variables

Varia.	Mean 1	Mean 2	t-value	df	p
(c)	2,40	4,00	-2,84	18	0,01
(d)	0,45	4,05	-6,51	18	0,00
(e)	1,00	5,00	-8,09	18	0,00
(g)	0,00	2,10	-2,33	18	0,03
(total)	13,75	27,77	-5,31	18	0,00

5. Discussion

Choosing a method for data collection is not easy, and is often influenced by the amount of resources. Questionnaires do not collect the same in-depth knowledge as interviews, but they have a major advantage of being easy to distribute in a broad range at a relatively low cost. The aim of this study was to compare if our new structured form produced improved (more detailed) incident reports than the currently used unstructured form. A starting point was found in that several acquired reports seemed to lack vital information, that is to say the report was raw. Could the incomplete forms be due to the method the reports were collected through? Our study has shown that an unstructured form will not help the observer to write a detailed report. We argue that the results (answers) in reports, are closely related to the questions raised in the report form, and that what is important is not only which questions are asked, but also the structure of the form. Accordingly, before designing or distributing incident forms, the stakeholders should carefully consider what they actually want to know (Christensen 2007). First then, there is a base of good quality and the form can be designed to fit its purpose.

In *Form 1*, we have tried to design questions to get hold of the information that, for example, CALL considers epresents the minimum information needed. The form is structured, all questions are given in a fixed order and it is highly concentrated around a specific topic. All questions are relatively short and several examples are

given to guide the observer. The number of questions has been adjusted to limit the form's total length. We have balanced requesting a lot of information with not losing the respondents' interest in a very long form. Beside the commonly used questions about *what happened* and *who was involved,* extra effort has been paid to acquire, *at what time*, *under what conditions* and *in what environment* the incident occurred.

We have also considered what NATO's lessons learned centre determines is valuable as they evaluate how mature an incident report is. In addition to CALL's requests, NATO specifically stresses that the proposed recommendation should address the cause of the incident. We believe that incident reports should provide space for conclusions/cause of incident as well as recommendations on how to avoid similar incidents. However, it is essential to understand that the observer of an incident often has access to a sharply defined part of an operation in a mission. The root-cause can seldom be found without a holistic perspective and therefore this task might be difficult for the respondent. It could also be contradictive to ask respondents to answer questions that they might not know or require them to predict what could be helpful in the future. However, the observer presumes to possess knowledge of what happened and we believe they should have an opportunity to describe what caused the incident and suggest actions if they can. However, this opportunity should never replace analysis, which is the next stage in the lessons learned cycle.

During both our experiments we used film sequences to show the participants' incidents. In that way, we had the advantage of knowing exactly what happened before, during and after each incident. The key report was extremely valuable as the reports were evaluated. Compared with evaluation of incident reports written in reality (without key documentation) we could identify what actually was improved in the reports.

Our new structured form provided significantly enhanced results, a (total) sum of all the eight variables, in experiment 1. In experiment 2 we used 10 different film sequences and yet the significant result was repeated. This indicates that our structured incident report form could capture knowledge regardless of the character or context of the incidents.

To confirm that form 1 is useful in a military context, further research is required. Additional experiments using officers employed by the Swedish Armed Forces as participants will be conducted later this year.

6. Conclusions

In many organizations, incident reporting methods are insufficient. The resulting reports appear to lack vital information, required by analysts to understand the incident and, as a result, management is unable to respond effectively.. It seems easier said than done to bring clarity of the root-cause of the incident and suggest suitable recommendations to prevent incidents from being repeated and to prepare for crises and response if they do. In our study we have redesigned an incident report form from a customer's request perspective, using interview and questionnaire research. We argue that results (answers) in incident reports are closely related to the questions asked, as well as the form's overall design. The aim was to construct a form that was easy to fill in, by avoiding difficult terminology, acronyms and abbreviations. The structured form does not require too much time to complete; we have tried to balance the respondent's effort with content for the analysts. The form starts with an open-ended question, followed by more direct questions. The questions are divided into sub questions under the heading 'Facts' in order not to squeeze several questions into one. Examples (cues) are given on purpose to lead the respondent.

A more detailed incident report does not guarantee learning in the organization. However, incident reports provide important information and are a foundation for analysis and learning over time. If analysts were provided with improved foundations, it would most likely increase the chances of building understanding of what happened and why the incident occurred.

The current research demonstrates that to improve collection, incident report forms should be planned and structured with a focus on customers' requests and designed to support and guide the observer to share their knowledge and experience.

Acknowledgements

The Swedish Armed Forces provided funding for this study and their support is gratefully acknowledged. I also thankfully acknowledge Prof. Brehmer for most valuable comments. Finally, special thanks are addressed to fil.mag. Granberg and fil.mag. Rehman at the Swedish National Defence College, for evaluation of reports.

References

Andersson, B-E. (2007). Som man frågar får man svar [Answers relation to Questions]. Mölnlycke: Erlanders.

Chua, A., Lam, W. & Majid, S. (2006). Knowledge reuse in action: the case of CALL. Journal of Information Science, Vol. 32, No. 3, pp. 251-260.

Christensen, L. B. (2007). Experimental Methodology. Boston: Person Education Inc.

Dekker, S. (2007). Just Culture Balancing Safety and Accountability. Surrey: Ashgate Publishing Ltd.

Nonaka, I. (1994). A Dynamic Theory of Organizational Knowledge Creation. Organization Science, Vol. 5, No. 1, pp. 14-37.

NATO BI-SC. (2007). BI-SC Directive Number 80-6 Lessons Learned. Norfolk: Supreme Allied Commander Transformation.

NATO. (2010). Lessons Learned Handbook. Lisbon: Joint Analysis and Lessons Learned Centre.

Oppenheim, A. N. (2005). Questionnaire Design, Interviewing and Attitude Measurement. Biddles Ltd., Norfolk.Pettersson, U. (2010). Acquisition of Experience-Based Knowledge from the Swedish Armed Forces International Missions; a Comparison between Groups and Individuals. Proceedings of the 7th International Conference on Intellectual Capital, Knowledge Management & Organisational Learning, pp. 360-366.

Pettersson, U. & Nyce, J. (2011). Hierarchy and Tacit Knowledge in the Swedish Armed Forces: An Organisational Approach. Proceedings of the 3th European conference on Intellectual Capital pp. 328-332.

Reason, J. (1997). Managing the Risks of Organizational Accidents. Hants: Ashgate Publishing Ltd.

Simon, H. (1991). Bounded Rationality and Organizational Learning. Organizational Science, Vol. 2, No. 1, pp. 125-134.

SwAF HQ. (2008). Swedish Armed Forces Headquarter 23 290:75766 - appendix 1. Stockholm: Swedish Armed Forces.

Synodinos, N. E. (2003). The “art” of questionnaire construction: some important considerations for manufacturing studies. Integrated Manufacturing Systems, Vol. 14, No. 3, pp. 221-237.

Trost, J. (2007). Enkätboken [the Book of Questionnaire]. Lund: Studentlitteratur.

US Army. (2009). Handbook Commanders Guide to Operational Records and Data Collection – Tactics, Techniques, and Procedures. Ft. Leavenworth: Combined Arms Centre. Retrieved November 12, 2010 from http://call.army.mil

von Thaden, T. L. & Wiegmann, D. A. (2004). The use of schematic aids to facilitate the incident reporting of critical events, paper number 2004-01-010. Safety Across High-Consequence Industries Conference

