

# Learning from C2 Situations in the Field – Identifying Lessons from a Major Forest Fire in Sweden

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## ABSTRACT

In July 2014, Sweden's full crisis response system engaged in a major operation as a small forest fire spun out of control, turning into the largest forest fire in Sweden in modern times. A number of investigations have been undertaken to understand the course of the fire and identify lessons for future crisis management. This paper presents one approach to identifying such lessons, the lessons learned process applied by the Swedish Armed Forces. The paper also highlights some of the major crisis response lessons from the fire, the most important being the failure to learn from lessons identified after previous forest fires. Results also show that the crisis response effort was negatively affected by a poor understanding of relevant actor's competencies and resources, as well as lack of continuity in the initial chain of command, and identifies the need for national prioritization of resources at times of major crises.

## Keywords

Lessons learned, Crisis Management, Forest fire, C2, Sweden

## INTRODUCTION

On the 31<sup>st</sup> of July 2014, a fire broke out in the woods outside of Sala, a small town in the Swedish province of Västmanland. Within a few days' time, the forest fire had turned into the largest in Sweden in modern times, covering an area of almost 140 km<sup>2</sup> (54 square miles or 34 600 acres). The situation called for a major crisis response in Sweden. Approximately 1,200 people and 1,700 domesticated animals had to be evacuated. Two persons were injured and one was killed in the fire. The crisis response effort engaged personnel from several emergency services and the police forces, as well as governmental authorities and non-governmental organizations. The Swedish Armed Forces (SwAF) was one of these actors, supporting the civilian rescue leader with personnel, materials and services. Since the SwAF's contribution to the crisis response operation was quite substantial, the Chief of Joint Operations decided that the most essential lessons from the operation should be documented.

Learning from operations – both national and international – is given high priority within the SwAF. Efforts requiring the engagement of a range of independent actors, are often difficult to evaluate and assess. However, learning from these events is no less important. For this reason, a small division was established at the SwAF Headquarters (HQ) in Stockholm in 2010 – the *Joint Analysis and Lessons Learned Division* (JALLD). JALLD is currently developing an approach to managing experiences and identifying lessons from complex operations. The approach focuses on *learning* from the experiences, rather than e.g. claiming accountability. It aims to identify methods which have been proved well-functioning and could be useful also in the future, as well as systems generating problems (that should be avoided). The approach also seeks to create opportunities for the participants to share their experiences and learn from each other. In August 2014, as the forest fire raged, JALLD was tasked to document the most essential lessons from the SwAF's contribution to the forest fire crisis

response operation. This paper presents the approach that was used and some of the lessons from the crisis management effort.

### **Aim and Purpose**

The purpose of this paper is twofold. Firstly, the paper seeks to describe the SwAF's approach to learning from complex operations. Using the forest fire as a case study, the paper illustrates how the approach can be applied to a crisis response operation. Secondly, the paper highlights some of the major lessons regarding Command and Control, as identified by various investigations into the crisis response effort in Västmanland, including but not limited to those identified by the SwAF. The purpose is to make relevant results accessible to other crisis management actors which might find them useful in future operations.

### **Method**

This paper is based on a report on lessons from the forest fire that JALLD produced in the fall of 2014, as well as JALLD's general method for identifying lessons learned. To increase the relevance of the lessons identified in the JALLD report, and better serve the interests of a broader spectrum of crisis response actors, the authors have also carried out a literature review of a number of investigations into the crisis response operation in Västmanland. The review covers a range of investigations by the local rescue services and municipalities; the provincial administration of Västmanland and national authorities such as the Swedish Civil Contingencies Agency on e.g. the spread and extinguishing of the fire; the management of initial and latter stages of the operation; and the support provided by external actors to the rescue services. The review also includes the report of the National Investigation into the forest fire which describes and evaluates the crisis response from an operational perspective.

### **Outline**

Below, the paper begins with outlining the event and development of the forest fire and the crisis response operation. The paper then describes the approach used by JALLD to identify lessons from the SwAF's contribution to the operation, starting with JALLD's general approach to the lessons learnt process and then specifying the method of the Västmanland investigation. Towards the end of the paper the most important overarching lessons identified from the general crisis response are highlighted, followed by a general conclusion.

## **THE FOREST FIRE**

The forest fire started in the afternoon on Thursday the 31<sup>st</sup> of July 2014. It had been a hot and dry summer in Sweden and it was not the first forest fire that year. When first observed, the fire was small, covering a mere 30x30 meters but spreading rapidly. By the time the fire department arrived it covered an area of 300x1000 meters (Henningsson, Jacobsen, Björkman and Thelberg, 2015). During the afternoon, the fire spread into a neighboring municipality which resulted in two parallel firefighting interventions, one on each side of the municipal border, with little coordination between the two interventions. The two local Rescue Leaders, who were in charge of the firefighting interventions, had difficulties getting an overview of the spread of the fire and, due to limited coordination, part of the fire was unattended to (Henningsson *et al.*, 2015). In the evening, one of the Rescue Leaders contacted the SwAF requesting helicopters to help extinguish the fire. The request was granted and the first helicopter arrived to the site the next morning. Thursday evening the fire covered about 60 hectares (150 acres).

The fire spread less intensely during the second day. Several helicopters (from the SwAF and civilian companies) participated in the firefighting. However, interoperability problems made it difficult for the rescue leaders to communicate with the helicopter pilots and coordinate the intervention. The two firefighting efforts continued as uncoordinated, separate interventions. On Saturday, the third day of the fire, the situation deteriorated. Winds increased and the fire kept spreading. Fire fighters tried to surround the fire with hosepipes but the attempts failed. In the evening of the third day, 2000 hectares (almost 5000 acres) were on fire. A decision was made to coordinate the two parallel firefighting efforts into one joint operation with a single Rescue Leader (Stålheim and Hildingsdotter, 2015). Due to the lack of overview of the situation by the local rescue services, the intensity of the fire continued to be underestimated. This led the local Rescue Leaders to undervalue the need for cooperation with, and assistance from, other entities. The local rescue services

continued to send the message that the situation was under control (Asp, Gynander, Daleus, Deschamps-Berger, Sandberg and Schyberg, 2015). This failed to allow relevant organizations to sufficiently prepare for what was to come.

On Sunday the 3<sup>rd</sup> of August the fire kept spreading. Seven helicopters were involved in the firefighting and a Rescue Leader made an international request for airplanes to water bomb the area. The request for international assistance was unusual in a Swedish crisis management context and contradicted earlier claims that the situation was stable. It however, functioned to make evident to national actors that the event was far from over (Asp *et al.*, 2015). Around noon on Monday 4<sup>th</sup> of August, the fifth day of the fire, the firefighters lost all control of the fire. Due to increasing winds the fire spread north very quickly (approximately 80 meters per minute). In only eight hours' time the fire quadruplicated in size. One man was killed in the fire and one of his colleagues was severely injured. About 1,000 people had to be evacuated from their homes. By the evening, the fire had grown to become the largest forest fire in the modern history of Sweden. The event was no longer labeled a forest fire but considered a major societal crisis (Asp *et al.*, 2015).

On Tuesday the 5<sup>th</sup> of August, on request by the local municipalities, the provincial administration of Västmanland took over the command and control of the intervention. A new Rescue Leader, tasked to remain in charge throughout the remainder of the operation, was appointed (Tengberg and Gert, 2015). After the regional take-over, the operation came to be formed as a national effort and the C2 structure was based on cooperation between a large number of organizations and agencies, led by the Rescue Leader, Deputy Rescue Leader, Chief of Staff and the Chief of Operations (Asp *et al.*, 2015). By this time about 200 people were involved in the direct rescue operation. The SwAF contributed with 100 home guard soldiers, 10-15 command and control staff, 12 mechanics, a number of nurses, military firefighters and all kinds of vehicles and resources that were needed to manage the crisis.

Over the next few days the firefighting efforts were intense. Emergency personnel, police, military, governmental organizations, private companies and a large number of volunteers participated in the crisis operation. Both people and animals were evacuated. Weather conditions were nevertheless favorable to the firefight from Tuesday onwards (Henningson *et al.*, 2015). Four airplanes, from France and Italy arrived on Wednesday 7<sup>th</sup> of August to drop water bombs over the fire. On Monday the 11<sup>th</sup> of August the fire was deemed to be fully under control. The rescue operation continued for an additional month and was officially declared over on the 11<sup>th</sup> of September.

### **THE JOINT ANALYSIS AND LESSONS LEARNED DIVISION'S (JALLD) APPROACH**

JALLD is a small division of three military officers and four civilian analysts that conducts lessons learned analysis on behalf of the Chief of Joint Operations. The analyses are generally based on interviews with personnel that have been involved in a particular event or situation – in this case, the forest fire. The analyses are usually conducted by two analysts – one military officer and one civilian analyst – with any one of these primarily in charge of the study. This has proven to be a good method, since the officers and the civilian analysts provide different perspectives to the analyses. The civilian analyst is largely responsible for ensuring an academic/scientific methodology and the military analyst provide expertise in the military domain. JALLD manages lessons learned on a wide scope of issue areas, for this reason the analysts rarely occupy any subject matter expertise. The analysts are recruited from diverse backgrounds but have been chosen to work at JALLD on basis of their ability to conduct investigative studies: academic background or previous work experience.

Even if two analysts are primarily in charge of collecting data and drafting the lessons identified report, the entire division contributes to review the working process and the results through a number of internal seminars – based on experience three seminars are usually appropriate. The first seminar is held in the start-up phase of the study and serves the purpose of ensuring an appropriate focus, delimitation and method of the study. The second is held after all data has been gathered and analyzed to review whether the purpose of the study has been met or if additional data/interviews are required. The final seminar usually focuses on the conclusions and recommendations, i.e. whether the most important lessons have in fact been identified. It also serves to review the draft report as regards language and readability since readers' ability to take in the conclusions of the report is essential to ensure learning from the lessons identified. At this stage of the process, the draft report is submitted for comments to all interviewees as well as a range of subject matter experts. In addition, an external seminar with the interviewees is usually arranged to discuss – in detail – the lessons identified in the study. The purpose of the referral process and the external seminar is to validate the analysis and conclusions. The seminar also serves to exchange experiences and ensure that the lessons are appropriately consolidated, to facilitate

lessons not only being identified but also learned – leading to actual improvements in the organization. These external seminars have proved to be much appreciated. After the seminar, the report is finalized and presented to the Chief of Joint Operations. When the report identifies lessons that require changes to the system and/or procedures of the SwAF, recommendations also specify the implementing agents. The purpose of this is to ensure that lessons are not merely identified, but learnt and acted upon. The Chief of Joint Operations then transforms the recommendation into a formal *order* or a *Chief of Joint Operation's decision*.

### **JALLD'S APPROACH TO IDENTIFYING LESSONS FROM THE FOREST FIRE**

As the forest fire in Västmanland was still ongoing, the SwAF Chief of Joint Operations realized that the experiences generated during the event would be important to ensure an effective participation in future crisis management. JALLD was thus tasked to document the most essential lessons of the SwAF's contribution to the crisis management operation. The report was delivered to the Chief of Joint Operations in February 2015.

To identify the major lessons, JALLD conducted a total of 31 interviews with personnel who had been involved in the forest fire operation. The majority of the interviewees were employed by the SwAF but belonged to different parts of the organization and had played a wide range of roles in the forest fire operation, e.g. commanding the operation, providing logistics support, or participated in the field. Two representatives from the local rescue service, including the provincial Rescue Leader were interviewed to get their view of the SwAF's contribution to the forest fire. Since the focus was on learning from the situation, the interviewees were asked to describe some of the major challenges they had faced during the fire, focusing on how they managed these challenges so these lessons could be used in future situations. They were also asked to describe best practices. The remainder of the method used followed JALLD's general approach, with internal and external seminars and interviewees and subject matter experts asked to provide comments on late drafts of the lessons report.

## **RESULTS**

### **Do Lessons Identified Get Learned?**

Perhaps the most important lesson identified in the various investigations into the event is the failure to learn from lessons identified after previous forest fires. Several of the investigations state that the conclusions and recommendations made could have been simply copied and pasted from investigations made in previous decades (Asp *et al.*, 2015; Henningson and Jakobsson, 2014; Henningson *et al.*, 2015:). One of the investigating officers compared the situation to the airline industry allowing repeated air crashes to be caused by the same faults in the system. It is not unlikely that the forest fire in Västmanland could have been more effectively and efficiently managed had lessons been appropriately utilized or recommendations implemented. This only serves to highlight the importance of a functioning lessons learnt system in crisis management.

The approach that was used to identify and document lessons from the SwAF contribution to the crisis response effort proved to be successful. Both the interviewees and the Chief of Joint Operations believe that valuable lessons were identified and documented. The interviewees emphasize the importance of the seminar that was held when the report was to be finalized. During the seminar the lessons from the forest fire were discussed and experiences were shared – several of the participants said that they learnt a lot from this seminar – much more than they would have done just reading the report. What lessons have in fact been learned remains to be seen at the next major crisis.

### **Insufficient Knowledge about Other Actors' Capabilities**

The investigations made into command and control of the forest fire identify a poor understanding of relevant actors' competencies and resources that could have been useful in the crisis management effort. While organizations like the SwAF had well-functioning routines for providing assistance to civil emergencies, the management of the fire was delayed due to a lack of knowledge amongst the rescue services of both what external resources existed, and how to request assistance from these. This also applied to many civilian resources. An important lesson is thus the need to keep updated lists of applicable resources amongst major crisis management actors, at both the local, regional and national level. It is also necessary to ensure awareness of the appropriate channels to explore such inventory lists and make requests based on them. A key factor for success of the operation was the deployment of on-site liaison officers from several external organizations. These were put in place once the rescue operation had been transferred to the provincial level and the new

Rescue Leader had established its headquarters, and were regarded to have significantly improved communication and collaboration between relevant organizations.

### Inability to Make National Priorities

Another important lessons identified is lack of structure and legislation as how to make national prioritizations of resources at times of major crises. As forest fires tend to occur during the same periods of the year, they naturally lead to competition over personnel and resources amongst various rescue services. Within a region, the provincial administration is responsible for making prioritizations but no similar structure exists at the national level in Sweden. This is perhaps a consequence of Sweden's highly decentralized crisis management system. The fire in Västmanland coincided with forest fires elsewhere in the country. This clearly affected the C2 of the firefighting effort as several entities made simultaneous claims on helicopters and other national firefighting resources. The task of prioritizing between these often fell on individuals without sufficient knowledge and information to make informed decisions.

### Continuity and Personal Relations

The failure of the rescue leaders to obtain an overview of the situation during the initial stages of the fire was partly a consequence of a lack of continuity: leadership of the rescue operation rotated between several individuals who applied their own chain of command. Who was in fact in charge was often unclear (Henningson and Jakobsson, 2015). Once the provincial administration took over the operation, a single Rescue Leader was designated for the remainder of the entire operation. The command team of the Rescue Leader, Deputy Rescue Leader, Chief of Staff and Chief of Operations was in charge 24/7 and responsibilities delegated to allow each six hours of rest on a daily basis. This method worked well from a continuity perspective but was not supported by rules and regulations. Sleep deprivation also became an issue after a few days. The effectiveness of the command team has nonetheless been attributed the already existing personal relationship in the command team, which facilitated efficient delegation of tasks. The individuals have themselves nonetheless argued that their experience of working together can largely be compensated by education and training (Asp *et al.*, 2015).

## CONCLUSIONS

This article has presented the approach relied on by the SwAF in gathering lessons from the Västmanland fire. As described in the results section, one of the most important findings from the lessons process was the failure of relevant organizations to learn from previous lessons identified. This serves to highlight the importance of continuously developing the processes which identify lessons. Even more so, it shows that the necessary next step would be to move beyond how to identify lessons and explore also why lessons identified are insufficiently learned.

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