THE IMPORTANCE OF EMERGENCY SERVICE PLAN IN MAJOR DISTURBANCES
- EXPERIENCES AND LEARNING'S FROM CASE GRANINGE KAINUU

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INTRODUCTION

Graninge Kainuu Oy reformulated its strategy and significantly restructured its operations at the end of the year 2001. A cooperation agreement signed with Eltel Networks and outsourcing network construction and maintenance operations to Eltel Networks were part of the changes made. As a result of the restructuring, the number of the company’s employees fell by 60%. The restructuring also affected Graning Kainuu’s own capability to react to major disturbances.

BACKGROUND

Graninge Kainuu Oy, whose area of network responsibility is in the Province of Kainuu in northern Finland, concentrates mainly on the distribution business and electricity sales. The company’s network responsibility is located in an area where population density is very low. The area covers about 22,500 km² and has about 95,000 inhabitants. The company has 53,000 distribution customers and 240 metres of electrical power network per customer.

Graninge Kainuu Oy had prepared comprehensive instructions for the operation and maintenance of the network in conjunction with the construction of a Quality and Environmental Management System, and the instructions were attached to the outsourcing agreement. Development objects, such as improving preparedness for major network disturbances and introducing electronic ordering, reporting and invoicing between the contracting parties, were also included.

THE STORM "MIELIKKI" SEPTEMBER 23rd 2003

The storm that raged on the day of Mielikki increased in power after 12 o’clock noon in the Province of Kainuu. The control room staff of Graninge Kainuu Oy soon noticed that the situation meets the criteria for a major network disturbance [1], level 1 (5-10 simultaneous failures on the medium-voltage network or more than 15 successive failures), due to which the activity laid down in the Instructions for Major Network Disturbances was started. The Instructions for Major Network Disturbances were prepared in collaboration with Eltel Networks as agreed.

First steering centre meeting

The staff of the steering centre assembled for its first meeting in an hour, and a representative of Eltel Networks took an active part in the steering centre’s work of during the entire major network disturbance. Based on weather forecasts, among others, the staff of the steering centre arrived at the conclusion at 3 p.m. that the expansion of the major network disturbance was inevitable, due to which Eltel Networks initiated the acquisition of a large amount of additional resources and delivered a helicopter to the area.

The storm power increases

By 7 p.m. it could be observed that the major network disturbance had expanded to level 3 (the most difficult situation with 30 simultaneous power failures on the medium-voltage network or more than 50 successive failures). Eltel Networks succeeded in its efforts to acquire plenty of additional resources from the other areas and other network construction companies located in different parts of Finland.

Communications - internal and public

More than 150 persons, of whom 1/3 came from outside the Kainuu area, took part in fault repair work. Occupational safety was given special attention and the idea was to use the dark and windy hours of the night for a break in the maintenance work and resting.

Figure 1: Fallen trees on power lines

The telecommunication network (remote control system, walkie-talkies) worked well. Thanks to the remote monitoring
data obtained from telecom stations, Eltel’s telecommunications technicians took the aggregates to the telecom stations well in time. In the main office and regional offices, the customer service units were manned to answer a huge amount of customer calls; the new Supply Interruption Information System was also helpful in the management of the customer calls. Information services were provided in compliance with the Instructions for Major Network Disturbances: the first press release was published two hours after the commencement of the major supply interruption, and the following press releases were published at four hours’ intervals between 6 a.m. and 10 p.m.; a total of nine press releases providing information on the Mielikki storm were published.

**The failure summary**

There were altogether 108 supply interruption areas (and there were several faults on the medium-voltage networks in each of the interruption areas), and the network disturbance affected a total of 20,000 customers. About 95% of the medium-voltage networks located in the countryside and more than 50% of the 20 kV overhead lines feeding smaller village centres had faults. Electricity was restored to the majority of customers a few hours after the commencement of the network disturbance. About 5000 customers were left without electricity for more than 12 hours and about 500 customers for more than 24 hours. The last failure was repaired 56 hours after the commencement of the interruption.

**EMERGENCY SERVICE PLANNING**

The importance and benefit of well defined and mutually made emergency service planning for major network disturbances was self-explanatory in the event of the storm in Kainuu province. A specific and structured plan including both agreements and amendments with service providers lead to more organised and simplified behaviour during the repair process.

**Content and goals of agreement**

The Network Care Agreement used for specifying operation, roles of the parties and service in major disturbances has the ultimate goals to solve and fix such disturbances and damages faster and more cost-effectively. The agreement defines how to jointly develop and maintain the efficiency and cost-effectiveness of the repair of major disturbances so that the improved ability to cope with such situations significantly improves the Client’s image and benefits the end-users.

**Level of the major disturbance**

In the case of Graninge Kainuu the impact of disturbance is divided into 3 levels, each defined by number of simultaneously or consecutive appearing failures. The level of disturbance is evaluated regularly, not only by what has happened, but using also whether forecasts and field information as predictive tools. Based on decisions operation according the disturbance level is activated according the operational manual.

**Situation management and communication guidelines**

The same way as disturbance level, all situation management functions, responsibilities and roles have been defined in the operational manual. Clarified operation and responsibilities of each individual person on different levels helps to avoid any misunderstandings or confusions during the action. It is also important for Network Company to define and prioritise work orders.

Securing internal communication demands tight cooperation with telecommunication network operators, since major part of workers communication is made by mobile phones. Therefore aggregates are needed to supply mobile base stations.

Public communication can be a hard task. To get positive client attitude and news publicity a communication plan must exist since ad-hoc communication is often unclear and misleading, sometimes even disguised. Communication must be frequent, accurate and when ever possible predictive. To ensure good communication during major disturbances customer bulletin should be used to inform end-users where and how to get information in the event of major power blackout. Further more good plans and relations with local public media (radio, news papers etc) are essential.

Frequent contact to authorities is also necessary to ensure executive assistance if needed.

**Resource management**

Each disturbance level defines also necessary resources to be able to conduct repair process. Resource plan is made for personnel, vehicles, equipments, spare parts and for both network and road maps, since most often at least part of the excessive repair work resources are “foreigners” not having the knowledge of local net or road conditions.
Special attention shall also be paid to the staff’s working hours and rest periods in the case of long-lasting disturbance repair and preventive work. Work safety must be #1 even though end-customer satisfaction and supply quality are important at all times. National legislation and collective labour agreements may limit working hours and sometimes impact on efficiency of repair process.

Investigation of the performance during the major network disturbance and the related communication were conducted successfully, and the cooperation between Graninge Kainuu and Eltel Networks and its subcontractors was smooth. Both Graninge Kainuu and Eltel Networks were given a great deal of positive attention in the public media for the exceptionally good handling of the major network disturbance that happened on the September 23rd 2003.

However there was a lot of luck as well. The storm on the September 23rd raised on midday and daylight time was still quite long, there was no snow on the ground yet and vacation period was over. In the worst case repair work could have been more severe and harder to conduct for example in November - February period with less than 6 hours daylight on the worst times and close to 1 meter deep soft snowdrift on the ground.