INFORMATION AND COMMUNICATION PLATFORM FOR CRISIS MANAGEMENT (IKK)

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ABSTRACT

Weather-related failures in supply networks, especially those with many overhead lines, may lead to large-scale supply interruptions of crisis proportions. To successfully cope with such crisis situations, it is of vital importance that the crisis organisations involved act in a fast and coordinated manner. To do this, all members of the crisis organisations must be supplied with comprehensive, easily accessible and intelligible information. For this purpose, RWE Rhein-Ruhr Netzservice GmbH has been developing an IT tool for crisis and communication management.

INTRODUCTION

RWE Rhein-Ruhr Netzservice GmbH, in cooperation with the University of Siegen and the company PSI, has been developing a tool for the processing and distribution of information in crisis situations, the so-called information and communication platform for crisis management (IKK).

The IKK platform sources its information from various RWE-internal sources such as the network control system, the emergency information system (NOTIS) and the failure management system (EMMA) as well as from external information sources such as emergency services or authorities. Thus, the IKK platform is a data warehouse that consolidates detailed information, drawing up and making available compact and easily comprehensible management reports and situation summaries in geographical and alphanumerical form. These reports and summaries are used as a basis for strategic decisions by the crisis team as well as for media relations work. The situation summaries can also be made available to other crisis organisations via interfaces or generally available communication media (e-mail, fax, SMS, etc.). The IKK platform is a self-contained unit which can be run independent of other IT systems. Its prime characteristic is its easy, intuitive usability.

INFORMATION AND COMMUNICATION IN CRISIS SITUATIONS

Crisis situations

A crisis situation is a situation where the events that led up to it can no longer be managed within the framework of routine services or normal operation within an adequate timeframe and/or where people are in danger of life and limb. As far as RWE Rhein-Ruhr Netzservice GmbH is concerned, crisis situations generally arise in connection with faults in energy supply plants and networks that result in large-scale interruptions of supply.

In crisis situations, the company must seek to control the crisis, i.e. keep an overview, identify and eliminate failure causes and restore normal operating conditions as fast as possible.

Crisis organisations

Crisis situations are generally managed and controlled by crisis organisations (crisis teams) that are set up by companies and institutions as a preventive measure.

Depending on its type and scope, a crisis situation requires the services of various different crisis organisations (e.g. companies, police, fire brigade, the German Federal Agency for Technical Relief (THW), state, district or local authorities, etc.). Each of these crisis organisations does its own assessment of the situation, takes its own decisions and carries out its own measures to manage the crisis. Decisions and activities are generally not or not sufficiently coordinated. This may even lead to multiple orders for specific activities, thus preventing the optimum use of resources.

Lessons learned from Kyrill in 2007

Hurricane Kyrill swept across Europe on 18 and 19 January 2007. In the service territory of RWE Rhein-Ruhr Netzservice GmbH alone, the storm caused around 700 failures in the medium-voltage network and almost 3,000 failures in the low-voltage network. Street lighting was also affected. Kyrill was thus responsible for one of the worst disruptions in the RWE network over the last 20 years. The storm hit vast areas in the federal states of North Rhine-Westphalia and Rhineland-Palatinate. In the Siegerland region, power lines and towers collapsed over a stretch of 80 kilometres. The Siegen-Wittgenstein district was put on emergency alert. Many roads were impassable.
RWE Rhein-Ruhr Netzservice GmbH moved in about 1,000 of its own employees, in addition to 370 workers from external companies. The damage caused by Kyrill to power lines and equipment of the RWE Rhein-Ruhr electricity network amounted to around 20 to 30 million euros. By Friday night, 19 January 2007, most of the medium-voltage network had been restored. By Saturday, 20 January, the entire network was back on stream.

The management of this crisis situation required the coordination of many different local units across a vast territory. To achieve this, the various divisions of RWE Rhein-Ruhr Netzservice GmbH had to stay in constant contact, including management, network control, communication, local control centres, logistics, etc. In parallel, RWE Rhein-Ruhr Netzservice GmbH had to communicate and exchange information with the superordinate teams in the RWE Group as well as with external bodies such as fire services and police, rural district and local authorities.

When reviewing the events in the wake of Kyrill, it became obvious that a constant and consistent data exchange between the various units of RWE Rhein Ruhr and the above-mentioned external bodies is an indispensable prerequisite for making well-grounded decisions for the sake of failure elimination. Thus, for instance, police reports about blocked roads provide important information for the RWE Rhein Ruhr units.

It also became evident that comprehensive system support is essential to get a better overall picture in case of such a large-scale disruption. To ensure that all crisis team members have the same level of information, online documentation of the crisis development has turned out to be of vital importance. Such a function would also enhance coordinated communication with other crisis organisations.

A system-supported data exchange together with a consistent and informative situation summary may provide support to crisis teams in making sound decisions to optimise failure elimination. Moreover, a consistent level of information is a prerequisite to keep the media and the public up to date with transparent information. After all, in case of a failure, customers expect network operators to supply them with fast and reliable information, especially about the length of the interruption.

**Existing communication channels**

To cope with crisis situations as fast as possible, it is therefore crucial to organise and, if possible, institutionalise the exchange of information between crisis organisations. This will be the task of the IKK platform. Fig. 1 illustrates the interaction of four crisis organisations via the IKK platform.

The IKK platform supports the already existing communication channels between the crisis organisations. Using prioritised call forwarding and VIP numbers for control centres and mayors/rural district administrators, RWE Rhein-Ruhr Netzservice ensures that it can be easily reached by relief organisations and local authorities. Moreover, e-mails are sent to the fire service and police control centres as well as to the representatives of local and rural district authorities to inform them about the beginning and end of disturbances in their territories. The joint IKK platform ensures that all offices of the crisis organisations depicted in the example of Fig. 2 are always supplied with consistent information about the progress of a crisis and the activities initiated. This allows the targeted control and management of the necessary activities down to the level of the staff deployed.

**INFORMATION AND COMMUNICATION THROUGH THE IKK PLATFORM**

The IKK platform is to provide the following information in
respect of RWE in dynamic situation summaries:

- supply situation
- failure locations and trouble spots (e.g. explosion sites, blocked roads, flood areas)
- units deployed
- special vehicles deployed
- activities initiated
- locations and manning of local organisation units (availability)
- locations and manning of all crisis teams involved (availability)
- weather information

To do this, the IKK platform makes use of existing information from network control and failure management systems as well as information from external systems maintained by fire services, police, other relief organisations and public administrations.

This information is controlled and consolidated by means of a filtering function so as to make it accessible in a user-friendly way to the various functions on the crisis team. The parameters for the filtering function can be set freely, thus enabling each organisation to find the perfect configuration for its functions. Fig. 3 illustrates the allocation of data-supplying IT systems (EMMA, Notis, etc.) to the functions supported by the IKK tool. Typical functions in crisis organisations are, for instance, management, corporate communications, personnel coordination, local dispatch management. These functions need specifically processed information “at the press of a button” to perform their tasks. Thus, for instance, the management function in a crisis organisation (crisis team managers) primarily requires situation summaries to be able to take strategic decisions. The corporate communication function moreover needs significant data and key figures to inform the media (e.g. areas affected, number of inhabitants affected, cause and probable duration of the failure).

Fig. 3: Interaction between individual systems and structuring of data via the IKK platform

Moreover, the IKK platform will have a documentation and archiving function to verifiably document all relevant information and activities relating to a crisis situation and its management.

Presentation of information on the IKK platform

The IKK platform aims to provide the various user groups described above with all important information needed to allow fast action in a crisis. That is why usability plays an important part in designing the IKK platform. Fast and easy usability is to result in fast action. Each member of the crisis organisations will receive the information needed for their respective tasks in an intelligible and manageable form. The situation summaries are presented on a geographical basis. The graphical design concept ensures both clarity and access to detailed information. This is achieved by means of layer and zoom techniques. Fig. 4 illustrates the supply situation after a large-scale failure in the service territory of RWE, aggregated to the rural district level.

Fig. 4: Graphical presentation of supply situation summary

IKK DEMONSTRATOR

On the one hand, the IKK platform will be a tool used for normal operation. On the other hand, due to its special characteristics, it will be especially used to support crisis management and crisis communication and document the related processes and activities in a verifiable way. It is planned to achieve high availability in permanent operation. At RWE Rhein-Ruhr Netzservice GmbH, the IKK platform will be realised as a self-contained IT system. This provides the option to introduce the IKK platform in other companies, too. Another option is the development of bidirectional interfaces with IT tools of other crisis organisations.

An IKK demonstrator is currently being developed on a self-contained hardware. It will be available from early summer 2009.