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Department for Public Security, Police and General Police Affairs,
Disaster Relief and Public Emergencies
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Final technical implementation report

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2. General reminder of project objectives, partnership and expected deliverables

2.1 Project objectives

The object of the research project was to analyse the collaboration between public authorities, companies, research facilities and support organisations in the context of critical infrastructure protection and to create an online portal to support the collaboration of the stakeholders.

2.2 Partnership

University of Potsdam
Chair of Business Information and electronic Government
Am Neuen Palais 10
14469 Potsdam
Germany

NBB Netzgesellschaft
Berlin-Brandenburg mbH & Co. KG
Charlottenstraße 79 / 80
10117 Berlin
Germany

Fire department headquarters of the voivodeship West Pomerania
Ul. Firlinka 9/14
71-637 Stettin
Poland

2.3 Expected deliverables

The aim of the project was to develop an online portal to support the building of a network between stakeholders, who act in the range of critical infrastructures.

It should have the following basic elements:

- A virtual Round Table for the institutionalised cooperation of public authorities, business companies and research facilities via the internet
- An online procedure by a virtual dialog field to diagnose interdependencies between critical infrastructures for the coordination of holistic protection systems
- An online knowledge map and online market for the simplified contacting of knowledge bearers to mediate research results, best practices and guidelines and to initiate cooperations.

3. General summary of the project implementation process

The project had a term of one year and nine months (1 January 2010 to 30 September 2011) and consisted of the following work packages:

Task A: Analysis of knowledge transfer activities
Task B: Construction of the online portal
Task C: Creation of the knowledge map
Task D: Integration of the EUKRITIS results
Task E: Construction method for the analysis interdependence
Task F: Test
Task G: Transfer
Task H: Project Management

Initially, an analysis of the knowledge transfer activities in the State of Brandenburg and in the West Pomeranian Voivodship was carried out based on an online survey. Due to a particular flood situation in May / June 2011, the Polish project partner was not able to perform the survey according to the original time schedule. The delays, however, did not have any impact on the course of the project and a report on the knowledge transfer activities in Brandenburg and Western Pomerania was prepared by 15 September 2010. The report also includes a comparison between the activities on knowledge transfer in Western Pomerania and Brandenburg.
In order to determine the requirements for the online portal workshops were conducted. With the participation of future players, the requirements for the online portal were fixed. The findings resulting from the online survey and the workshops were incorporated into the concept of the online portal. Basically, it has been the goal to provide an online portal for the end user free of charge. As part of the selection of suitable software, various alternatives were taken into account. Finally, the decision was taken in favour of some license-free software. Spatial data required by the online portal can be obtained free of charge from Landesvermessung und Geobasisinformation Brandenburg (LGB), a municipal enterprise of the State of Brandenburg. The online portal could be finally implemented with the function of a knowledge map in the essential points in March 2011.
After the completion of the substantial work for the implementation, the test could start on 23 July 2011 and was completed by 31 July 2011. The findings resulting from the test were included in the further improvement of the online portal.
The results from the project EUKRITIS (action guidelines) are available for download via the portal. In addition, the partners and contacts from the previous project EUKRITIS were actively involved in designing the online portal.
At the same time, research was carried out on the analysis of interdependence. The analysis of interdependence focuses on dependencies that exist between the various critical infrastructures within an overall system. The University of Potsdam developed and programmed a respective dynamic model that was integrated into the program as an independent application environment of the online portal.
The prototype of the portal is currently available under www.kritisport.de. This also contains the elements of the analysis of interdependence.
The costs of the project amounted to 334.018,97 € and were thus only slightly higher than the originally calculated € 309,584, whereby the equity ratio of the project partners increased. The increase in personnel costs is mainly due to higher salaries and higher expenditures for the implementation of the portal and the coordination of the project than originally estimated. The other partial budgets were kept.

4. Evaluation of the project management / implementation process

Within the framework of the project EUKRITIS II, the Ministry of the Interior and the University of Potsdam had many contacts with operators of critical infrastructures. These contacts could improve the mutual understanding, and some insight into each other's organizational and operational structures was gained. The findings were incorporated into the concept and the development of the portal. Based on the integration of the Polish project partners, insights into the structure of the State Fire Service in the West Pomeranian Voivodship as well as their dealing with critical infrastructures could be received.
It was the biggest challenge in the context of the practical work to implement the findings of research within the framework of the project as well as of programming to create a suitable application for the end user. Requirements for features and design of the online portal could be incorporated during the entire term. Above all, the test phase showed errors in the operation, which could be corrected. Contacts with the operators in the context of PR and the performance of workshops ensured that the practical relevance is maintained.
It has been ascertained that aspects applying to the functions "project exchange", "knowledge map", "Wiki" and "forum" of the online portal cannot be established for the analysis of interdependence.
The modelling, data collection, especially of network data and the recording of disturbance scenarios are of such a high complexity that the application by a simple user cannot be done without any instruction. In this regard, the collaboration with the administrator / operator of the online portal is still considered to be necessary. However, this could be done in the context of public relations.
Another claim of the players focused on the generation of added value through the use of the portal. In this respect it is to recognize that the cooperation between state authorities and the operators of critical infrastructures at regional level is considered to be necessary and appropriate, insofar as it relates to the cooperation in the field of local civil protection. However, if the objective of the work is of strategic nature, then the level of the Federation or the level of European institutions is of some interest.
In general, the collaboration with the project partners was good. The partners contributed their expertise to the project.
Furthermore, the cooperation with the project partner Komenda Wojewódzka Państwowej Straży Pożarnej in Szczecin promoted the already existing good relations [1] between the State of Brandenburg and the West Pomeranian Voivodship in the field of fire prevention and civil protection.
In 2010, the State of Brandenburg established the post of a "representative for cooperation with East European countries in the field of fire prevention and civil protection" to improve international cooperation. The commissioner was therefore involved in the project EUKRITIS II.
It was also of advantage that representatives of the Safety Centre of the Polish government were present at the final event in Szczecin. In this respect, it was ascertained that the Polish government has considered establishing a similar web portal. Support has been offered accordingly.
The topic of "Critical Infrastructures" is also pursued emphatically by the federal government, particularly on the part of the Federal Ministry of the Interior. It is intended at federal level to establish a working group with the federal states. Brandenburg will also be represented in this body and is going to make the findings from the project more widely known.
The cooperation with the European Commission was good. It was also highly positive that the responsible agent could participate in a project meeting at the European Commission. As part of another contact, the European Commission could support the further project work with valuable clues.

[1] Based on the agreement concluded between the Federal Republic of Germany and the Republic of Poland on mutual assistance in case of disasters or serious accidents dated 10 April 1997 (Federal Law Gazette II p.1178), an agreement between the Brandenburg Ministry of the Interior and the Minister of the Interior and the Public Administration of the Republic of Poland on mutual assistance in disasters and serious accidents was concluded on 25 July 2002.

5. Activities

5.1 Task A (Analyses of knowledge transfer activities)

For the purpose of performing the online survey, questions were prepared and a corresponding questionnaire was created in German and Polish. After that, the organizations qualified for the survey were identified. The questionnaires were sent to a variety of players, partially also by using interest groups, aiming at the widest possible dissemination. The online survey was programmed and executed by the University of Potsdam. The invitation to participate in the survey in Western Pomerania was performed by the Commandant's Office of the State Fire Service of West Pomerania.
In Brandenburg, the response rate fell short of expectations. The large attendance in the West Pomeranian Voivodship was gratifying. Despite the low response rate in Brandenburg, data was sufficient so that a report on the activities of knowledge exchange in Brandenburg and Western Pomerania could be prepared according to the planning.

5.2 Task B (Construction of the online portal)

The concept of the online portal included the findings of the online survey. In addition, the requirements were put in concrete terms with the project partners at a workshop on 19 May 2010 and at a workshop with operators of Critical Infrastructures, academic institutions, charities and public authorities on 14 July 2010.
Based on the wishes of the project partners, a catalogue of requirements was prepared for the portal. Under this precondition, different versions of software were considered. Finally, the decision was taken in favour of a license-free software (elgg). Elgg is an open-source software for the establishment of social networks. It contains different functions (such as blogging, file repository, user profiles). A right /role system controls the access to the user data. This ensures that no costs for software licenses will incur subsequently. As with other software products, costs incur for web hosting and administration.

5.3 Task C (Creation of the knowledge map)

The critical infrastructures can be divided into different sectors. Based on this classification, overviews on the players in Brandenburg and in the West Pomeranian Voivodship were prepared. Here, the information already acquired under Task A was also included.
The knowledge map is part of the online portal. Therefore requirements apply being applicable to the portal itself, even in the field of the knowledge map. Accordingly, the results of both workshops and the findings could be gained in the context of personal contacts.
The University of Potsdam created the knowledge map. This is a combination of a knowledge inventory map and a list of experts. By using a corresponding search function, the portal user is able to find relevant knowledge sources.
The administrator of the portal also offers the possibility of producing an overview of the lack of knowledge carriers based on the entered knowledge areas. Thus, gaps meaning any lack of contact in a crisis may be identified.

5.4 Task D (Integration of EUKRITIS results)

The results of the previous project EUKRITIS "transformable protection structures and impact assessment for the prevention, response and recovery to disasters" form two guidelines. These guidelines can be simply provided for download through the function of the portal. It is also possible to state one's own position on the guidelines and to comment on them in the forum. Furthermore, it is

possible via the averaging function to give users of the portal information on existing download opportunities.

5.5 Task E (Method construction for the interdependence analysis)

The topic "analysis of interdependence" constituted the focal point of research within the project. Initially, the University of Potsdam examined, which knowledge and methods have already been available.
As part of the research at the University of Potsdam it was found that there is currently no method available in the special fields to perform dynamic analyses of interdependence. There have been attempts in this respect (in chemistry, biology or computer science), but it is not apparent that parts of these research results can be used for the analysis of interdependence. Static models for investigation cannot show any processes on a timeline.
The University of Potsdam developed a dynamic method for performing an analysis of interdependence. Based on this, the programming of the function and the integration into the online portal were performed.

5.6 Task F (test)

As part of the test phase, the program structure of the online portal (program elgg) was evaluated with the social software features as well as the knowledge map.
Based on the results of Task C, a list of players was created who were invited to participate in the test. Fortunately, 23 participants had expressed their interest. Within the framework of the test phase, which lasted until 27 July 2011, the players got the opportunity to share their experience and to make additional proposals.
The findings from the test phase were immediately incorporated into the further development of the portal. In particular, changes were made to the layout, which led to improved clarity and user friendliness.
A validation of the analysis of interdependence could not be made in this context, because the implementation of the interdependence analysis was delayed. The test of this function was made later. The required use of real network data was not possible, as no sufficient number of users was yet available for the modelling of the respective organizations. The accuracy in modelling the respective organizations would have been devaluated to a spurious accuracy in the overall view. However, it was possible to perform a validation. For this purpose, specialized scenarios were prepared to show different modes of action of disturbances within a system. The size of the scenarios has been chosen such that the simulation process and the occurring system status can be understood, evaluated and interpreted by an expert panel.

5.7 Task G (Transfer)

The terms and conditions of use were elaborated. In addition, data protection information has been filed, so that all users know how his/her data is dealt with.
In the context of two final events, one taking place in Szczecin on 5 and 6 September 2011 and another one in Potsdam on 27 September 2011, the results of the portal were presented to players in the field of critical infrastructures and the essential functions were demonstrated. The participants in these events came from academic institutions, operators of critical infrastructures, aid agencies and public administrations. Thus, contacts could be established from all fields that will use the portal in future.

5.8 Task H (Project Management)

Partnership agreements were concluded with the project partners. Moreover, in this context, a business trip was carried out to Szczecin to explain the Polish project partner, i.e. Komenda Wojewódzka Państwowej Straży Pożarnej in Szczecin, the tasks within the framework of the project.
The kick-off meeting at the European Commission was held in Brussels on 11 January 2010, the opening event with the project partners on 4 March 2010.
A steering group chaired by the head of department IV in the Ministry of the Interior was established. This group consists of the project partners, as well as a representative of the Federal Office for Civil Protection and Emergency Aid and the Berlin Senate Department for Internal Affairs and Sports and the commissioner for cooperation with East European countries in the field of fire prevention and civil protection. Three meetings of the Steering Group (8 July 2010, 29 November 2010 and 12 April 2011) took place.
Where necessary, meetings took place with the project partner Komenda Wojewódzka Państwowej Straży Pożarnej w Szczecinie (21 September 2010 and 27 June 2011, Szczecin).
When selecting the software for the portal, several variants were taken into account, also the involvement of a software engineering company in the development. For this purpose, regular meetings took place with the NBB Netzgesellschaft Berlin-Brandenburg GmbH & Co. KG and the software company forcont business technology GmbH, Leipzig, to decide on the technical implementation of the portal. Finally, this variant was not further pursued.
Meetings with the University of Potsdam were performed in a two to three week interval, depending on demand.
Furthermore, the coordinating project partner (Ministry of the Interior) participated in a training course on the European Project CIWIN in Vienna on 28 September 2010.[2] As part of this training, however, important findings regarding the efforts at European level and the dealing with the definition of European Critical Infrastructure could be acquired. In this respect, it was ascertained that the focus of the project CIWIN lies on the knowledge exchange between administrations.
During the development phase, the project EUKRITIS II could be presented at the following events or promoted by the participation of project staff in the context of personal interviews:

- "Security industry meets science - transfer day with entrepreneurs and scientists in the civil security sector", 11 March 2010, Königs Wusterhausen,
- 56th Meeting of the Steering Committee "Energy Management" of BDEW (Federal Association of Energy and Water Management), State Group Berlin-Brandenburg, Cottbus, 16 June 2010,
- Workshop of the German European Security Association (GESA), Berlin, 18 June 2010,
- Annual final meeting of the Environmental Committee of the Chamber of Commerce of East Brandenburg, 5 November 2010, Frankfurt (Oder),
- Security Forum 2011 of the University of Applied Sciences Brandenburg, 27 January 2011, Brandenburg (Havel),
- Presentation of the knowledge map at CeBIT, 1 to 5 March 2011, Hanover,
- 5th Day of Science at the University of Applied Sciences of the Police of the State of Brandenburg, 7 April 2011, Oranienburg
- Symposium on "Critical Infrastructure - Risk Management" by the DEGAS e. V. and the Federal Agency for Technical Relief, 16 May 2011, Berlin
- 58th Polish-German business forum "expansion of the cross-border cooperation through the transfer of knowledge and experience in the fields of fire prevention and emergency services", 15 June 2011, Radzicz,

[2] As, however, no direct connection with this project can be seen, the costs incurred were not paid from funds of the project EUKRITIS II.

- SAFE, Antwerp, 4 to 6 June 2011 Antwerp - the financing of the participation was effected by own resources of the University of Potsdam,
- KnowTech 2011 (13th Congress on Knowledge Management (KM) in Enterprises and Organizations), 28 and 29 September 2011, Bad Homburg - the financing of the participation was effected through own resources of the University of Potsdam

Furthermore, publications were made in the following media:

- Behördenspiegel, edition February 2011,
- eGovernment Review, edition no. 8 July 2011

A publication was made in the magazine "Civil Protection" of the Federal Office for Civil Protection and Disaster Relief in autumn 2011.

6. Technical results and deliverables

6.1 Task A (Analyses of knowledge transfer activities)

It was the aim of this work package to create an overview of the activities to exchange knowledge in Brandenburg and West Pomerania as well as to get a national comparison (Germany, Poland). The relevant data could be collected. The complete report is attached as Appendix 1 to this final report.

6.2 Task B (Construction of the online portal)

Based on the results of the online survey and the results of the workshop with the project partners on 19 May 2010 and the workshop with operators of critical infrastructures, academic institutions, charities and public authorities on 14 July 2010, the concept for the online portal was created and continuously further developed, especially during the test phase. See Appendix 2.
The prototype of the online portal is completed and available at www.kritisport.de in the internet. It is operated by the Brandenburg Ministry of the Interior, administrated by the University of Potsdam and provides the following functions:

- Ability to create personal profiles and profiles of the organization
- Network, email, and contact functions
- Functions for file management
- Knowledge map
- Project exchange
- Wiki
- Analysis of interdependence.

6.3 Task C (Creation of the knowledge map)

A concept for the knowledge map was created. See Appendix 3.
The knowledge map is part of the online portal and hence also available under www.kritisport.de in the internet.

6.4 Task D (Integration of EUKRITIS results)

The mutability analysis in the context of critical infrastructures - result of the project EUKRITIS - has been integrated via a suitable range of guidelines for action for downloading and offered for further use.

6.5 Task E (Method construction for the interdependence analysis)

The University of Potsdam developed a method for performing analyses of interdependence. It is a dynamic simulation or rather a dynamic model for which a corresponding concept was created. See Appendix 4.
The formal description through Petri nets only serves illustration purposes. The data model of the technical realization does not use Petri nets because the computational and data management efforts would have been too large and inefficient. Programming and computation are performed via specialized tables.
In this respect, the model to be formed and simulated is regarded as a set of production units being connected with each other through input-output relations. The definition of input and output types is centrally managed by the administrator. Each infrastructure that is not necessarily a critical one at the same time, forms an own production unit. The transport of input and output is done via networks that may also represent critical infrastructures. The definition of networks is also a central task to be performed by the administrator. This requires the specification of large amounts of data; therefore the input shall be carried out most conveniently via tables. The external definition files can also be created by the respective operators. In the field of interdependencies, personal discussions will be indispensable between operators and public authorities also in future in order to win them for their cooperation and to model networks. To limit the model complexity and to simplify the usability for the end user, scopes for configuration may be restricted.
The function of the analysis of interdependence has been programmed and integrated into the online portal accordingly. A weakness of the function is deficient user convenience because of lacking graphic visualisation of the analysis. It has to be improved to make it understandable for end users.
Already during the project phase, it has been shown here that it is the biggest challenge to find a balance between banality and complexity, as the quality of the analysis correlates directly with the amount of data that must be entered.

6.6 Task F (test)

An online questionnaire was made available to the participants of the test. Fortunately, 14 users made use of this opportunity. In particular, valuable findings could be obtained through the provision of open questions, which were incorporated into the design of the portal. A report on the test phase was prepared. See Appendix 5.

6.7 Task G (transfer)

To specify guidelines for the conduct of the players on the online platform in terms of content and form, these guidelines ("community guidelines") shall be binding. They can be read on the website prior to registration. See Appendix 6.
In order to support the use of the website, a user manual is available that can be expanded as needed. The user manual, called "Erste Schritte" ("First Steps") is available online. In addition, users can make

notes during a discussion on the user manual, which can then be considered by the Administrator at the next update.
The online portal of the University of Potsdam was designed such that it is intuitive, i.e. the user has the opportunity to learn the functions of the portal, similar to other online portals, independently. In addition, the function "Wiki" was used to provide supplemental instructions, so that the user can get much easier access to the portal. This option offers the special advantage that the users can get an upgrade in a very simple way.
The portal is currently operated as a prototype. Interested users have the opportunity to familiarize themselves with the functions. Special user training is not required as the operation of the portal is intuitive. However, to facilitate the access a file "Erste Schritte" ("First Steps") was added online to give the users some support. Appendix 7
A report on the transfer measures was created, see Appendix 8.

6.8 Task H (Project Management),

By 31 July 2010, the first progress report was prepared for the European Commission. A further progress report followed on 15 February 2011 and then the final report was prepared.
Furthermore, internal project management reports were produced regularly (31 March 2010, 30 June 2010, 30 September 2010, 31 December 2010, 31 March 2011, 30 June 2011).
In addition, regular meetings were carried out with the University of Potsdam (at least once per month) and if necessary, at longer intervals, with the other project partners.

7. Evaluation of the technical results and deliverables

The University of Potsdam developed a functional online portal that is suitable for networking and communications. With regard to the analysis of interdependence, however, it has to be stated that the operation of the function, in particular of the central functions of data entry, requires background knowledge and that the amount of data necessitates correspondingly considerable efforts. The design of the portal is similar to the concept of social networks such as facebook. Regardless of the social software features of the online portal, the focus is not on presenting itself. An active participation of the players in the portal constitutes a prerequisite for the success of the portal, in particular the field of the analysis of interdependence cannot be operated without appropriate input of data. This data is made available and the own organization or its own supply network has to be modelled. There is some doubt because of various discussions held with players whether the operators will participate without the presence of corresponding legal obligations.
They expect to receive - for their participation and the thus required efforts - a counter-value in the form of relevant information. Such efforts have to be taken not only for the initial entry of data, but also for data maintenance. The findings resulting from an analysis of interdependence are primarily used to assess the consequences for the society as a whole. Indirectly, a conclusion on the own organization may be drawn as well. In case of an appropriate participation it would be conceivable that the simulations could illustrate a realistic picture of the consequences of a failure of one or more critical infrastructures.
It is, however, apparent that such a portal could also be used to make the own organization more well known or to represent the offers of their own organization.
The field of tasks of "critical infrastructures" is perceived in the Ministry of the Interior. Here, staff and rooms specially equipped for coping with crises and disasters have been made available. Furthermore, appropriate contacts with operators of critical infrastructures exist. The professional advice or the provision of liaison officers within the framework of the management of disasters constitutes the objective thereof. As part of discussions with the operators it has been identified that the cooperation with the local divisions of fire prevention and disaster management (especially in Seveso II plant) is the

main concern. Joint exercises are performed at this level. As regards the strategic level, and the topic of Critical Infrastructures is - without any doubt - part of this, the collaboration between administrative authorities and operators at European level or, at least at federal level, is seen to be conducive.

8. Follow-up

Within the framework of the project phase, several variants were examined with regard to the financing of the running costs of the portal. The possibility of collecting membership fees, the financing of the portal from the budget of the Ministry of the Interior, the funding through an association, etc. were taken into account. In the context of discussions with future stakeholders, an operation by the Ministry of the Interior is particularly considered.
Against the background of the necessary fiscal consolidation, it remains an open issue whether the running costs could be reported within the budget of the Ministry of the Interior.
The live operation of the portal will not directly follow the end of the project phase. First, there will be still a trial run to make editorial changes and to introduce the portal to future players.
Not only technical work was undertaken at the online portal during the 21-month project work. In addition, numerous contacts were also established, especially with operators of critical infrastructures. Apart from this, the collaboration with a non-profit organization has developed as well that dedicates itself to the protection of critical infrastructures and thereby also promotes the exchange of knowledge in this field.
As part of these contacts it has been shown that the personal contact with the actors is of particular importance. In this respect, an online portal could be an effective support.
The development of an online portal within the framework of the project so far has strengthened existing connections and enabled the establishment of new cross-national contacts, especially with operators of critical infrastructures. As this statement also applies to the project partner in the West Pomeranian Voivodship (Poland), the main project objectives were achieved.

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