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Author(s):	Maurice Said, Hayley Watson, Su Anson, Kush Wadhwa (TRI)
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Foresight Tools for
Responding to
cascading effects
in a crisis

[FORTRESS](#) is a 3 year project (April 2014 – March 2017) involving 13 partners and 4 associated partners from 8 countries. It is funded by the EU FP7, under grant agreement no 607579. The FORTRESS project is developing tools that can be used in a cascading crisis, to allow crisis managers to prepare for future crisis situations. The first of these tools, the scenario builder (FSB), allows users to simulate an actual crisis scenario including selecting affected infrastructures. The second tool, the FORTRESS Incident Evolution Tool (FIET) will allow real-time decision support and enhance communication between different crisis managers and stakeholders. Through this annual newsletter we hope to provide you with an update on our progress in the FORTRESS project thus far and inform you about upcoming events.

Work Package updates

This year the work completed as part of FORTRESS focused on the following Work Packages (WPs):

Work Package 2 examines issues (e.g. lack of preparedness) which could assist decision-makers in avoiding a crisis (and cascading effects). This analysis is based on the assumption that crises and cascading effects occur when vulnerabilities overwhelm the resilient elements of a system. As part of this WP, [D2.3](#) was completed which analyses vulnerability and resilience factors (e.g. weakness of organisational culture) regarding cascading disaster situations and shows the ways in which these factors interact.

Work Package 3 identified case studies of 10 past and different crises (natural, technological, infrastructural and financial) in Europe and globally. The case studies were analysed to understand multi-organisational risk management and communication (e.g. who takes decisions in a crisis and are decisions followed) in different scenarios. As part of this WP, [D3.4](#) (an outline of the FORTRESS workshop for external stakeholders) and [D3.5](#) (translates the outcomes of the different tasks conducted in WP3 into requirements for the technical development of the FORTRESS tools) were completed.

Work Package 5 focuses on the actual practice of crisis management and the communication among and between organisations, governmental agencies and other groups including the affected citizens. The WP examines if and how plans and rules, routines and unforeseen internal and external behaviours affect crisis communication and how communication is and should be prepared to manage cascading and cross-border

effects. This year partners have carried out simulation exercises with stakeholders in 3 countries, with one remaining simulation exercise to be conducted in April 2016.

Work Package 6 consolidates the research results in previous WPs to design and develop generic and complete models of the cascading and cross-border effects in crisis situations. This provides a methodology and a tool for consistent, evidence-based building of scenarios for crisis events. The collaborative platform, the FORTRESS Scenario builder (FSB), provides state-of-the-art modelling of crisis scenarios that will provide the common basis for the description of different crisis scenarios. Work has been conducted on operational mock ups to illustrate how the FSB functions.

Work Package 7 involves the design and development of the FORTRESS Incident Evolution Tool (FIET), an easy to use tool that follows the double-purpose of being a foresight tool and decision support tool, combining training and exercise purpose with real-time decision support. It integrates a range of models and features enabling crisis managers and decision makers to create a Common Operational Picture. Work on the FIET is continually ongoing.

Work Package 8 tests the utility, efficacy and user-friendliness of the FORTRESS Incident Evolution Tool (FIET) with a group of engaged stakeholders who would use it to assist in crisis management. The WP also develops a training manual for the FIET based on user experiences and testing activities, as well as a demonstration and tutorial video for the FIET based on the training manual. A detailed draft of field-trial structure and data capture was conducted and distributed to partners for comments and debate.

All of these reports and further information on all WPs may be found on the [Research page](#) of our website.

Workshops and events

Over the past year, FORTRESS partners have organised and participated in a number of workshops that have facilitated the exchange of ideas between project partners and stakeholders. Beginning with a workshop in London, here are the main workshops organised and attended by FORTRESS partners:

- [Multi-stakeholder workshop on modelling and incident evolution tools](#) - London, UK -10th April 2015 - The event was attended by FORTRESS partners and external participants that belonged to a range of civil protection and crisis management organisations from across Europe, and the multi-stakeholder workshop served as a first opportunity to discuss preliminary versions of the FORTRESS tools with a small group of first responders. The issue of how such tools could be deployed on an operational level was also debated, and the outcomes of the debate served to build a more grounded and effective tool.
- [Domino Workshop](#) - Zwijndrecht, the Netherlands 20-22 May 2015 - Co-organised by FORTRESS partner The Institute for Physical Safety, the workshop was a joint 3-day public event to which several EU projects and first response organisations contributed. It included demonstrations of crisis management systems in

mobile field command centers for realism, and exposed participants to front-line users and their working situations. There were 12 workshops on key themes designed to facilitate debate and agreement on future requirements for crisis management systems. Multiple FORTRESS partners were represented at the event.

- [Scenario validation workshop](#) - Berlin, Germany 16th October 2015 - The workshop in Berlin focused on a specific flooding scenario to exemplify one of many different scenarios that will be used for the FORTRESS Incident Evaluation Tool (FIET).
- 8-9 December 2015: Leon Hempel, TUB, and Robert Pelzer, TUB, presented '[Der FORTRESS Scenario Builder: ein Tool zur Sichtbarmachung von Kritikalität und Pfaden kaskadierender Systemausfälle in Netzwerken interdependenter Infrastrukturen](#)' at the second International Workshop on Innovation for Crisis Management (I4CM) in Berlin. This event was aimed at sharing best practices between crisis management professionals from all over Europe, as well as to support innovation by highlighting technological development needs and experimentation benefits. It also provided an opportunity to increase the network of organisations and institutions dealing with crisis management.
- Over the past months FORTRESS partners have been putting the Fortress Scenario Builder (FSB) and the FORTRESS Incident Evolution Tool (FIET) into action through four simulation events and workshops, during which the tools were tested and feedback from stakeholders was collected.
 - Exercise in Italy was completed on January 8th in Turin.
Responsible partner: SITI
 - Exercise in the Netherlands was completed on February 25th in Apeldoorn. Responsible partner: IFV
 - Exercise in France was completed on March 8th in Paris as part of the Sequana national exercise. Responsible partner: EDF
 - Exercise in Germany will take place on the 19th of April in Bocholt at the firefighter academy. Responsible partner: TUB.



Presentation at the Domino workshop (20-22 May 2015)

New Publications

Over the past year FORTRESS partners have been busy developing the data emerging from the project into various publications, here is a list of FORTRESS publications over the last year:

- Pescaroli, Gianluca and David Alexander, "[Critical infrastructure, panarchies and the vulnerability paths of cascading disasters](#)", *Natural Hazards*, 12 February 2016, p. 1-18
- Hagen, Kim, "[The 2007 Solomon Islands earthquake and tsunami: cascading effects and community resilience](#)", *SECED 2015 Conference – Earthquake Risk and Engineering towards a Resilient World*, Cambridge, UK, July 2015.
- Watson, Hayley, Kim Hagen and Tom Ritchey, "[Experiencing GMA as a means of developing a conceptual model of the problem space involving understanding cascading effects in crises](#)". *Proceedings of the 12th International ISCRAM Conference*, Kristiansand, Norway, May 2015.
- Hagen, Kim, Meropi Tzanetakis and Hayley Watson, "[Cascading effects in crises: categorisation and analysis of triggers](#)", *Proceedings of the 12th International ISCRAM Conference*, Kristiansand, Norway, May 2015.
- Watson, Hayley, Kim Hagen, Susan Anson & Kush Wadhwa, "[Working with emergency responders across Europe to enhance crisis communication practices](#)", *British APCO Journal*, Volume 21, Issue 1, March 2015, p.22-23

A list of earlier publications can be accessed through the [project website](#).



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Trilateral Research Ltd.
Crown House
72 Hammersmith Road
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