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Next Generation Damage and Post-Crisis Needs Assessment Tool for Reconstruction and Recovery Planning

Capability Project

Results of Component Testing

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Author(s)	Roger Berglund, Anneli Ehlerding, Björn Gregorsson, Tobias Carlberg, Håkan Hansson (FOI)		
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Authors	**Name**	**Partner**
	Roger Berglund	FOI
	Anneli Ehlerding	FOI
	Björn Gregorsson	FOI
	Tobias Carlberg	FOI
	Håkan Hansson	FOI
Contributors	**Name**	**Partner**
	Bastian Lindner	TUD
	Niko Joram	TUD
	Jonathan Naundrup	GeoSig
	Isaiah Saibu	GeoSig
	Sathish Nammi	ARU
	Hassan Shirvani	ARU
Peer Reviewers	**Name**	**Partner**
	Corrado Sanna	TECNIC
	Dimitris Bairaktaris	DBA
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ABBREVIATIONS AND ACRONYMS

ABBREVIATION	DESCRIPTION
ICP	Integrated Circuit Piezoelectric
PETN	Pentaerythritol Tetranitrate
RDX	Research Department Formula X (i.e. Cyclotrimetylenetrinitramine))
TNT	Trinitrotoluene
FOI	Swedish Defence Research Agency
TUD	Technische Universität Dresden
GS	GeoSIG Ltd
PCB	PCB Piezotronics, manufacturer of piezoelectric sensors
HBM	Hottinger Baldwin Messtechnik GmbH
ARU	Anglia Ruskin University
LPS	Local positioning system

EXECUTIVE SUMMARY

This report contains a description of the component tests performed within the project RECONASS. The project RECONASS aims to provide a monitoring system for constructed facilities that will provide a near real time, reliable, and continuously updated assessment of the structural condition of the monitored facilities after a natural or manmade disaster. The above assessment will be seamlessly integrated with automated, near real-time and continuously updated assessment of physical damage, loss of functionality, direct economic loss and needs of the monitored facilities and will provide the required input for the prioritization of their repair.

At the end of the RECONASS project, a final test of the system will be performed. In order to test the components for blast impact, and get results which would make it possible to through simulations make estimates and calculations for the final test, these component tests were performed. An additional purpose of the tests was that the sensors developed in RECONASS had the possibility to be tested for blast resistance.

In the component tests, scaled reinforce concrete elements were tested against blast load. In a first test set up four single members, i.e. slabs, were tested with different load, and in a second test set up two multi node structures were tested. In all the tests a large amount of different gauges monitored the blast load and the behaviour of the elements with high time resolution (up to 250 kHz). The design of the tests, such as the amount of explosives and distances, was done in parallel with simulations within RECONASS. These simulations also gave useful guidance in choosing gauges for the test, and provided the sensor development with important information about the durability of the equipment against blast impact.

The simulation and scaled test results showed good agreement, and by using these tests and simulations the design of the final test, the RECONASS pilot test in Älvdalen, will be performed.