

Programme of Work for SCI-193: Detection and Neutralisation of Route Threat

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ABSTRACT

As a follow-up of the SCI-133 Task Group on countermine technologies a technical activity proposal for an Exploratory Team on detection and neutralisation of route threat has been submitted to the SCI Panel in 2006. After endorsement by the Panel a first Exploratory Team meeting has been held in February in the Netherlands. The output of this meeting was a draft Program of Work that will be presented to the SCI Panel with the recommendation to establish an SCI Task Group. The work of this Task Group will focus on the assessment of capabilities of equipment (both under development and operationally available) for the detection and neutralisation of threats as encountered on and along the route by NATO forces in mission areas in realistic scenarios from the systems aspect. The Group could be the platform for new technologies of sensors and methods for detection and neutralisation of route threat which are or will be considered by the SET Panel and its working groups. In this paper the current version of the Program of Work is elucidated.

BACKGROUND

In September 1991 the Defence Research Group (DRG) established the Special Group of Experts for Combat Engineering Technology (SGE/CET). This Special Group was established following a request of the Land Group IX of the NAAG. Two fields of research were identified by this SGE:

- remote detection of minefields and
- stand-off neutralisation of minefields.

At a later stage, the topic of close-in detection of mines was added to the first field of research. Two research groups were formed that covered the two fields of research mentioned. In June 1997 both groups completed their final reports. It was concluded that for both remote detection of minefields and close-in detection of mines several technologies showed promise, but these technologies were still in an early stage of development. The first research group was asked to continue to monitor the technologies and update its recommendation on an annual basis. Moreover, this research group should review the future threat of off-route mines, area denial weapons and smart munitions and assess technologies for detection and neutralisation.

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As a response to the international interest in the problem of landmines that are abandoned after conflicts worldwide, the Defence Research Group produced a report on the characteristics of humanitarian demining requirements in contrast to military case. The DRG was requested to place emphasis on potential dual use applications of military countermine technologies and a third research group was created, focusing on dual-use mine clearing technologies. In the new structure of the NATO research organization the three research groups were joined in the SCI-046 Task Group that started in 1998. This Task Group submitted its end report on mine detection, mine neutralisation and dual-use countermine technologies in December 2001.

Because of the rapid progress in mining and countermining techniques, it appeared necessary to continue and update the work. In 2002 the SCI-133 Task Group started. The objectives of this group were the identification of technologies of close-in and remote mine detection, mine neutralisation, and dual-use technologies which provide the best short, medium and long-term potential in countermine operations. The final reports [ref 1, 2] were submitted for publication in December 2006. One of the conclusions of this Task Group was that at least a number of techniques for stand-off detection and neutralisation of off-route mines seem to have potential for countering other off route threat such as improvised explosive devices (IEDs).

STATUS

A Technical Activity Proposal (TAP) was submitted to the SCI-Panel in September 2006 proposing the establishment of a new Task Group to perform a more detailed analysis of the potential of the techniques for countering route threat as identified by SCI-133 [ref 3]. The SCI-Panel endorsed the formation of an Exploratory Team that will develop a recommendation on the future content of the Panel's technical program, such as the start of a new Task Group.

In February 2007 a first meeting of the Exploratory Team was held at TNO Defence, Security and Safety in The Hague, The Netherlands. The aim of this meeting was to investigate the interest of potential NATO partners in participation in the proposed Task Group and to identify systems that may be available for common demonstrations, tests and trials. Interest for participation was shown by Belgium, Canada, Czech Republic, France, Germany, Netherlands, United Kingdom, United States and NATO Consultation, Command and Control Agency (NC3A). Most represented countries presented detection and neutralisation equipment that may be considered for demonstrations, tests and trials. Apart from that, a test site was offered for a first common demonstration, test or trial and the availability of and requirements on targets for such a test were discussed. Ample time was used to work on the draft Program of Work, which is summarized below.

OBJECTIVES

According to the current view of the Exploratory Team, the objective of the future Task Group will be the investigation of the physical and operational potential and limitations of techniques for stand-off detection and neutralisation of route threats including area defence weapons (ADW) and IEDs. A wide range of technologies can be considered, for example infrared, electro-optical and radar systems, which exploit spectral, polarisation and temporal features for detection. The analysis of existing and emerging detection and neutralisation techniques will be supported by the following activities.

- Conduction of a common data acquisition test, including analysis and reporting.
- Common analysis of field and laboratory tests.
- Exchange of information via reports, in depth presentations and workshops.

- Visits to field and laboratory tests (potentially including active participation by support personnel).

The emphasis of the Task Group is on the first two activities. In fact, according to the view of the Exploratory Team, the uniqueness of SCI-193 is based on these activities: the assessment of equipment under development for the detection and neutralisation of route threat in realistic scenarios.

TASKS

The Exploratory Team has identified the following tasks for the SCI-193 Task Group.

Task 0 A pilot test. Because of the high urgency to field systems to counter the route threat, a pilot test is proposed. The aim is to test readily available detection and neutralisation systems early in the term of the Task Group. Available targets and existing test procedures will be used. This task will result in a Quick Look report.

Task 1 Definition of threat and scenarios. The aim of this task is to identify the key characteristics of the route threat, including the scenarios, as encountered by NATO forces. Existing reports can serve as starting point for the threat and scenario definition. Suitability for the set-up of demonstrations, tests and trials of detection and neutralisation techniques will be a criterion in the definition. The threat and scenarios defined can be subject to a user review, for instance by a group of military with experience from NATO missions.

Task 2 Identification of systems and equipment. The aim of this task is to identify all systems and equipment necessary for the tests and monitor their timely availability. These systems and equipment include not only the systems under test, but also the targets used in the tests, data acquisition systems and the test site. It may be considered to manufacture appropriate targets.

Task 3 Design and set-up of tests. The aim is to design the tests, to write test plans and to set-up the tests according these test plans. An important issue will be the definition of criteria for the assessment of the test results.

Task 4 Execution and analysis of tests. This task focuses on the actual execution of the common demonstrations, tests and trials, and the analysis and reporting of the results. Reports will be delivered that recommend detection and neutralisation technologies and systems for countering the route threat.

TECHNOLOGIES

At the current stage it is too early to present a complete list of the technologies that will be covered by the future Task Group. However, it is foreseen that both vehicle mounted and airborne technologies for route threat detection will be included in the common demonstrations, tests and trials. These techniques include infrared, electro-optical and radar systems, which exploit for example spectral, polarisation and temporal features for detection. The sensor technologies should be complemented with the appropriate signal and data processing techniques.

With respect to neutralisation of the threat, advanced decoy, jamming and signature duplication techniques can be considered, in contrast to technologies that require a direct line of sight.

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WAY AHEAD

A second meeting of the Exploratory Team is scheduled for July 10 till 12 and will be hosted by DRDC Suffield, Canada. The aim of this meeting is to finalize the Program of Work, to draft the Terms of Reference and the Technical Activity Proposal, and to prepare the recommendation to the SCI Panel on the establishment of the SCI-193 Task Group. Since a clear interest is observed in the proposed Program of Work from at least eight NATO countries, it is expected that this Task Group can start its work by the end of 2007. The security level of the Task Group will be NATO restricted or higher.

REFERENCES

- [1] SCI-133 Task 1 - Investigation of the Threat from Off-Route Landmines and Identification of Potential Countermeasures
- [2] SCI-133 Task 2: - Guides for planning and reporting tests of landmine detection, mechanical clearing and neutralisation systems.
- [3] Technical Activity Proposal 'Detection and neutralisation of route threat', SCI-Panel, Ottawa, 29 August 2006.