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Overview of Anti-Terrorism Related Research Ongoing at the TNO Defence Research Organisation

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Since the 11 September 2001 attacks in the United States, also in The Netherlands the terrorist threat has become a serious concern. There is an increasing concern about the security of the public and vulnerability of vital components of national infrastructure. Since then, a number of from terrorist activities suspected persons have been arrested in the Netherlands and a number of concrete threats on tunnels, railway-stations and public buildings have occurred. Consequently, on behalf of various governmental organisations the Anti-Terrorism research effort at the TNO Defence Research Organisation has increased considerably over the last few years.

This research has been focused on issues like:

- Determining the threat of terrorist attacks facing the Netherlands and what types of weaponry (B-, C-weapons and conventional explosives), may be used in different scenarios.
- Detection of High Explosives.
- An assessment of the vulnerability of vital infrastructure, such as energy facilities, telecommunications, water supply, and public buildings, through a quick scan.
- Possibilities for protection against CBRN-threats.
- For some selected infrastructure an assessment was made of the blast vulnerability. Therefore specific scenarios were drafted (e.g. a large car bomb explosion at some distance in an urban area) and the blast vulnerability and consequence for buildings was assessed. In case needed, advice was given on protection measures, in terms of the use of blast resistant windows and structural retrofitting. This work was done using methodologies like:
  - Described in Technical Manual 5-1300 “Fundamentals of protective design for conventional weapons”;
  - Experimental data (e.g. on windows) as obtained in TNOs blast simulators;
  - Numerical simulation of blast propagation and diffraction using TNOs BLAST-3D code; and
  - Structural response analysis using hydro-codes or TNOs toolbox approach.
- A small protection blast container of 60 cm cross section was developed that is capable of capturing the fragments of small high explosives items (up to 1 kg HE charges) and redirect the blast away from people and vital infrastructure. This protection device can be used to reduce the threat of suspected packages at airports, railways or found in public buildings.

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- Much is known about the effectiveness of blast barriers, which may be used as a preventive measure.

In the paper an overview of the research ongoing at TNO Defence Research, a number of specific cases and concrete findings will be reported.