

BLAST VULNERABILITY OF PERSONNEL IN A CONTAINER BASED OBSERVATION POST

S. O. Christensen, S. Skudal

Norwegian Defence Estates Agency (NDEA), P.O. Box 405 Sentrum, NO-0103 OSLO, Norway

Norwegian military units face new and challenging tasks when establishing camps in out of area operations. The requirements for protective structures in the camps often include low cost, low transportation weight, low construction time, reusability and high survivability for personnel in case of attacks. The Norwegian Defence Estates Agency (NDEA) is participating in the Canadian trial series Elk Velvet organized by Defence Research and Development Canada (DRDC). In this trial series different protective structures for the use in out of area operations are tested for their blast vulnerability and their ability to mitigate blast treats to there personnel inside.

One of the Norwegian contributions to the 2005 Elk Velvet 3 trial is a 10 ft ISO-container based observation post (COPv2). This paper deals with its ability to protect personnel inside against the blast treats from weapons with enhanced blast. The 10 ft container based observation post is a double walled structure, where the wall is filled with sand or crushed rock when installed in the camp.

Several full scale trials were conducted with weapons of varying sizes and explosives. The charges used simulated thermobaric charges (TBX), Fuel-Air Explosives (FAE) and Improvised Explosive Devices (IED). To record the loadings on the structure and personnel inside during the trials, pressure transducers, manikins and high speed video were used. To evaluate the blast protection given by the structure a square head manikin were used. The manikin is equipped with pressure gauges to evaluate ear drum damage and nonauditory injury.

The post trial analysis includes an analysis of the blast ingress and its influence on the manikin inside the structure. Using different methods eardrum rupture and nonauditory injury was evaluated.

The results from the trial show that the blast from Enhanced Blast Weapons and Improvised Explosive Devices needed to damage and destroy the structure exceed the levels for inflicting blast injury to the personnel occupying the position. The structure has a mitigating effect on the blast, but some level of nonauditory damage (lung damage) and serious eardrum rupture must be expected with high blast loadings.