Reinforcement to resist blast and fragmentation of an ISO Container with replaceable dissipative panels

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ISO containers are commonly used as shelter in international military operations. Current force protection engineering measures meant to increase the survivability of personnel and operational systems are provided by heavy and costly solutions that require deployment of heavy equipment and the availability of construction materials, that allow little flexibilty after being put in place and are hardly replaceable in the event of an attack. The traditional shape of the maritime ship container's walls provide them with good ductiliy and plastic deformation characteristics, which are useful to withstand the overpressure ocurring during the detonation of an explosive charge (*blast*). There are several solutions for the reinforcement of containers to resist *blast*. The present work intends to develop a alternative cost effective solution base on the external attachment of dissipative panels, light enough to be installed or replaced by two men and transported inside the container itself.

METODOLOGY

One of the key features of the study is real scale live explosive tests. Threat requirements (explosive net weight and distance, fragmention patterns and ballistic events) must be determined. The characterization of the impact of the threat requirements on a standard ISO container will be conducted in a live range or explosively driven shock tube. Numerical simulations will also be made and calibrated with the results of the live explosive tests. The reinforcement panels and support conditions will then be designed and assessed through numerical simulation. A prototype of the designed reinforcement panels will be built and tested in live range or explosively driven shock tube.

RESULTS/RESEARCH IMPACT

Results of the research should be able to translate into the national defense industry and be implemented within the Armed Forces expiditionary deployment of military and civilian personnel in military operations.

▶ **Fig. 1:** Use of ISO containers in military operations

▶ **Fig. 2**: Real scale live explosive tests range (PRT Army)

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