EXPERIMENTAL STUDY OF THE COMBINED MECHANICAL EFFECTS ON COMPOSITE RADOMES

CANTON,E.;GRATIAS,S.;KOEHLER,K.;KLAUS,M.;KLUBERT,L.

Upon the explosion of a nuclear weapon in the atmosphere, exposed materials are successively struck by a thermal flash due to fire ball radiation, then by a shock and blast wave. The time interval between the arrival of the two phenomena on a target varies from I to 10 seconds for the yield and range usually considered.

Most simulations performed until now in Western countries to study the mechanical effects of nuclear explosions (thermal effect, blast effect) do not cover the rapid succession of the two aggressions : thermal and blast effects are generally separately simulated, or sometimes one after the other (in a cumulated way), by using one facility for thermal testing and another one for blast testing (the time interval is then very long when compared to the actual one). But combined tests in which the blast wave strikes a still thermally loaded target is very rare.

For certain targets however, the combination of the two aggressions can generate different damage to that produced by one only of these aggressions, or by the simulation of the two aggressions with a non realistic
time interval.

This is why, to evaluate the influence of combined thermal and blast effects, a joint study was conducted by France and Germany on the behavior of a German radome considered as a generic target, towards various kinds of aggression (thermal effect alone, blast effect alone, cumulated thermal and blast effects, and combined thermal and blast effects).

The purpose of this presentation is to analyze the experimental part of the study.