

## **BLAST LOADING OF TYPICAL NAVAL STRUCTURES"**

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In the year 1984/85 at the German Armed Forces Proving Ground MEPPEN the first demolition experiments with full scale sections of frigate-sized hardened warships of the future were executed.

The test section I consisted of 2 compartments with a chamber volume of about 210 to 250 m<sup>3</sup>. The effects of small uncased charges of 2 to 8 kg HE and at last by a cased cylindrical 50 kg HE charge against steel plate structures were analyzed. The effect of the 50 kg detonation was already considerable.

The following test section II (1986) mainly consists of 6 compartments with a chamber volume of about 270 to 380 m<sup>3</sup> and additionally of 2 deck houses with 100 m<sup>3</sup> each.

As a „big bang“ an internal detonation of a 150 kg HE charge and a casing mass of 350 kg steel was carried out.

By mean of simplified methods the expected area of severe structural damage is predicted. Depending on structural characteristics and warhead data the so called damage radius is calculated for each different kind of the typical naval structures. This damage radius is a measure upto which distance from the point of detonation a plate structure will be destroyed. The different resistances of the different plate structures will cause a damage extension into the direction of weaker structural components.

The numerical results for the damage area are compared with the damage prediction due to a blast effect computer code for the vulnerability assessment of surface ships.

By means of these procedures the global damage area caused by an internal detonation of warheads can be estimated quickly and sufficiently accurate.