BLAST LOADING OF STORE HOUSE OF 27 TONNE TRIAL

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TNO Prins Maurits Laboratory has participated in the 27 tonne trial in 2002 in Woomera, which was carried out under supervision of the UK. TNO has taken care of the blast measurements. One of the challenges TNO has taken up is to try to measure the pressure inside the ammunition store house. Since the charge density in this case was 50 kg/m³, this means that the circumstances for the transducers were very severe, including the heat radiation at such a close distance, the fragment throw from the bomb shells and a failing structure. As far as known, no experimental data is available for such situations.

The carbon resistor pressure transducer, a method which was originally designed at WTD-52, was applied. Three transducers had been installed to measure the pressure loading inside the storehouse. The measurements had outdone the expectation. No technical problems had occurred. All three transducers had given a sensible signal before fall-out occurred.

Also a numerical simulation of the test situation has been carried out with use of the finite element code LS-Dyna. Both a 3D-model and a 2D-model were made. With the numerical results the measurement data could better be analyzed and understood. The (particularly qualitative) similarities between the experimental and the numerical results have increased the confidence in the measurement technique and in the experimental data obtained.