AN INTERACTIVE DYNAMIC RESPONSE ASSESSMENT OF RC SLABS UNDER COMBINED BLAST-FRAGMENT EFFECTS

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This paper will describe a study aimed at analyzing the interactive dynamic behavior of RC slabs subjected to combined blast and fragment loading. The methodology consists of the following steps:

- Address previous tests of RC slabs and explosive charges with embedded roller bearings.
- Decompose and track the blast and fragment environments, as they reach and act on the slab, and compute their corresponding loads.
- Use the fragment loads to calculate the induced structural damage by impacts and penetrations.
- Use the damage to compute the corresponding nonlinear structural resistance function.
- Use the nonlinear structural resistance function to compute the dynamic structural response to combined blast and fragment loads.

The blast part of the problem used the software ConWep, while a separate program was developed for the fragment portion, based on particle motion. The structural resistance function and the dynamic response were obtained with the computer code DSAS. The method was compared with available test data of an overhead explosive charge with ball bearings facing the slab.

The paper will describe the development of the approach, present examples for the various steps and full analyses, and provide conclusions and recommendations.