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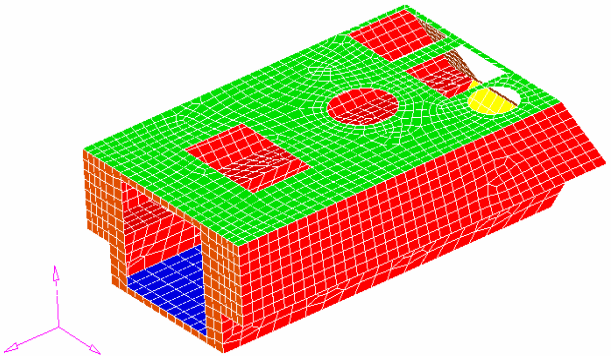
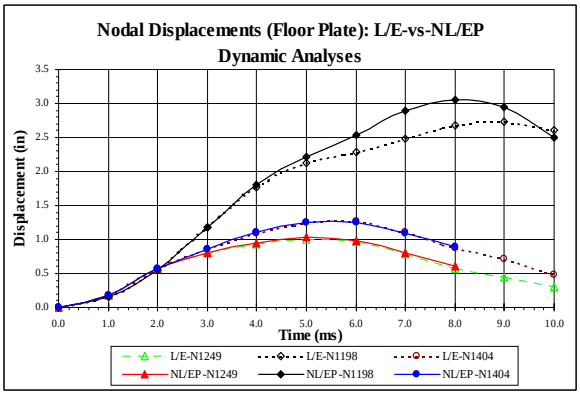
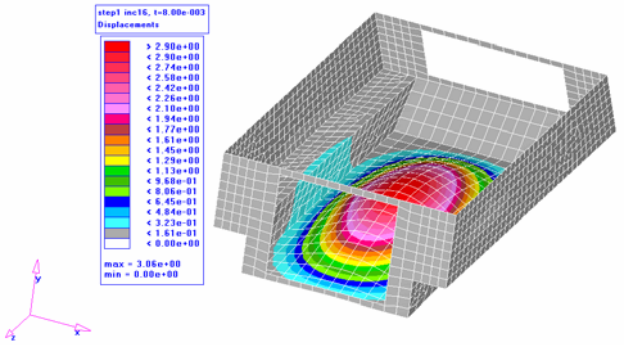
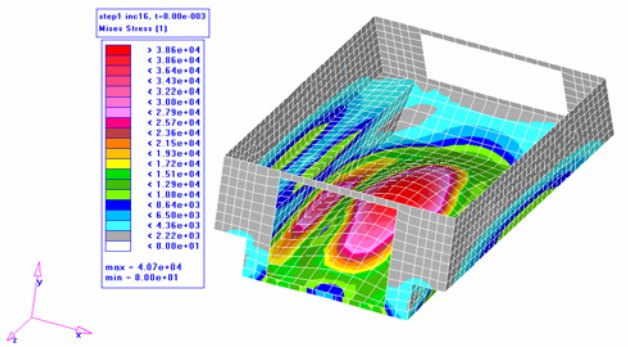
BLAST RESPONSE OF LIGHT ARMOR VEHICLES (LAVs)









DESCRIPTION:

Light armored vehicles (LAVs) are playing an increasingly important role in the support of troops, personnel carriers, and other more heavily armored vehicles. As such, these vehicles and the personnel they transport are at much greater risk of exposure to severe battlefield conditions, including explosive loading from enemy fire and land mines. Research into the response of these dynamically complex systems under explosive loading is essential to the evaluation of the structural vulnerability of protective armor and the minimization of blast-induced damage susceptibility. This study focused on the applicability of existing dynamic analysis and design methodologies to the blast response of LAV's. A detailed review of a number of methodologies was conducted, including a discussion of their advantages and limitations. Emphasis was placed on those most suitable for modeling the dynamic behavior LAVs. The finite element method was selected as the most suitable methodology to illustrate the blast response of such a detailed and dynamically complex LAV configuration. Static, natural frequency, and dynamic analyses of the model were then performed using both the VAST and ABAQUS finite element programs. Both geometric and material nonlinearities were accounted for during the static and dynamic analyses. The analysis results provided valuable insight into the behavior of LAVs to complex blast loads, and will be used in the development of analysis and design guidelines in the next phase of the work.

Reference:

P.A. Rushton, T.S. Koko, (2000). "Blast Response of Light-Armored Vehicles," Martec Technical Report No. TR-00-32