

## NEW TECHNOLOGIES FOR OCCUPANT SAFETY MODEL SET UP AND ANALYSIS

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### ABSTRACT –

During the development and design process of a vehicle, occupant protection in impact studies has become a standard analysis. One of the most important issues that crash analysts face is how the passenger's seat and the dummy will be adjusted for the laboratory tests. This makes the application of numerical simulations inevitable. Simultaneously, as new legal tests and regulations are continuously introduced, the amount of relative load cases has been increased dramatically.

In order to set up standardized processes that will minimize the complexity and lead time of the numerous crash simulations, automated and efficient tools are continuously being developed by CAE software providers. The positioning of the seat and the dummy is a demanding process in CAE simulations. From the import of the model in the pre-processor, till the output of the solver files, a lot of complicated steps, in a strict hierarchy, have to be followed. BETA CAE Systems has implemented some special tools in ANSA pre-processor for setting up, with the minimum human interaction, all the load cases of a dummy and seat system, according to the current regulations and protocols.

For each loadcase a standardized report is usually required. For the generation of such reports all the followed post-processing actions are always the same. In addition, the use of different dummies per test, adds more similar post-processing actions. Therefore, in order to overcome this time consuming and prone to errors repetition, the automation of the execution of those actions and the subsequent report generation is required. Apart from automating the repeated post-processing actions another problem is to compare the results of the simulated tests with the results of the physical tests. For this reason the Occupant Injury Criteria tool has been developed in  $\mu$ ETA, the post-processor of BETA CAE Systems. Different dummy types can be processed simultaneously from many simulations and physical tests and the results are overlaid in order to be compared. The tool provides an efficient and easy manipulation of the created results for better inspection and comparison of them.