ENHANCEMENTS IN DUMMY MODEL DEVELOPMENT AND OUTLOOK

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ABSTRACT:

It has been almost 11 years since FTSS introduced the Hybrid III 50th dummy finite element model in 1996. From their inception, Finite Element dummy models were constrained in size and accuracy by the computational resources and modeling capabilities of the time. In recent years, the numerical simulation and analysis industry has benefited from the advanced computing technology and finite element modeling techniques.

Today the latest technologies are being utilized to further improve the dummy model accuracy, and stability. A key requirement for new models is to achieve a level of geometric accuracy unattainable a decade past. The new CAD data source for FE models is derived from 3-D laser and X-ray scanned geometry to ensure the accurate representation of hardware geometry both externally and internally. New material testing is being utilized to compliment existing data sets and allow for the replacement of simple material models with more complex/realistic definitions.

Experiments with oblique loading conditions have been designed to further enhance the FE model. This data will allow validation in conditions experienced by many dummy model users. Additional tests will be carried out to examine different impact pulses to attain the highest level of dummy model performance verification.

These advanced technologies are being implemented in the dummy models to further improve their quality.