



CASE STUDY

HyperWorks Tailors CAE Processes to Reduce Cell Phone Development Time at Motorola

Overview

Using HyperWorks, Motorola significantly reduced CAE cycle time by automating the process of input deck generation and results evaluation. By deploying HyperWorks' process automation engine, analysts created a customized solution to simulate cell phone models more quickly.



Business Profile

Motorola is known around the world for innovation and leadership in wireless and broadband communications. The Fortune 100 company designs, manufactures and markets personal communication devices that are inspired by the company's vision of Seamless Mobility.

Challenge

Various challenges, such as rapidly condensing design cycles, increasing product complexity and lower profit margins are driving the product development of electronic mobile devices. In order to design new products in less than 10 months, which is the goal at Motorola, the traditional "build and test" approach has been widely replaced by upfront simulation (Fig. 1). Reduction in simulation cycle time is therefore critical to shorten time to market. Finite-element mesh creation, contact and constraint definition, model debugging and results interpretation took more than two months in 2000. At that time, Motorola chose to use HyperWorks to automate time-consuming manual tasks, such as interference checking or post-processing.

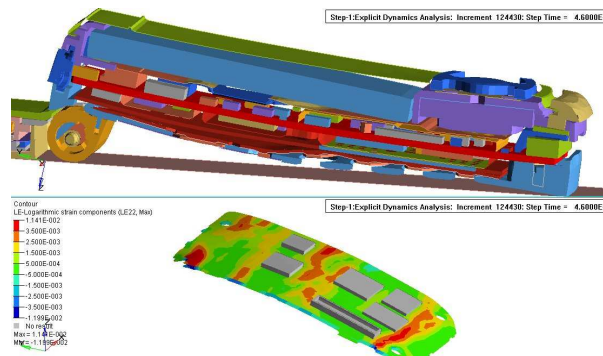


Figure 1.
Cell phone drop simulation

"HyperWorks enabled us to tailor simulation processes to our specific requirements and significantly improved our simulation efficiency."

Dr. Kinzy Jones
Manager
Advanced Mechanics Group
Motorola, USA



Solution

Finding Part Interferences

Cell phone models typically consist of hundreds of components in a very small package space (Fig. 2). If CAD or finite-element modeling is not accurate, undesirable physical interferences between parts can occur. Using the traditional process, an analyst needed up to three days to manually find and correct the interferences in the virtual model. Using HyperWorks, Motorola's engineers created an automated process to find and correct these issues. The "interference matrix" (Fig. 3) shows modelling errors in a graphical format and the "interference solution GUI" supports the analyst in resolving mesh problems. As a result, model checks can now be performed in just one hour.

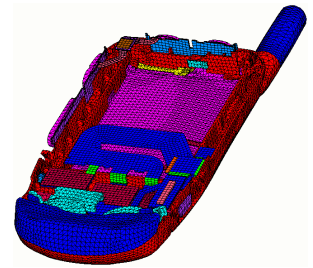


Figure 2.
Cell phone mesh

Automate Post-Processing

Using HyperWorks' automatic reporting capabilities, Motorola's engineers created a standard report of drop simulation results (Fig. 4). The automation creates graphical, top-level overviews about potential failures from high-impact forces for every part of the cell phone. As a result, analysts and designers can quickly review the structural integrity and eliminate the risk of "missed results" that result from the complexity of the simulation models.

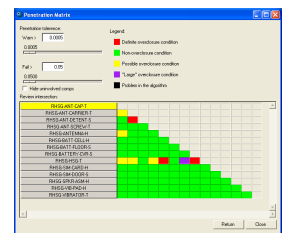


Figure 3.
Visualizing modeling errors
with the Interference Matrix

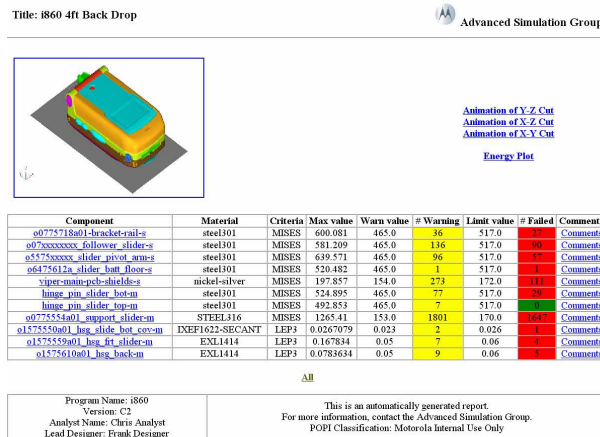


Figure 4. A standard report of drop simulation results for quick identification of failed parts

Benefits

- Overall CAE cycle time reduced from eight weeks to 24 hours
- Up to 90 percent time-reduction for model interference checking
- Easier interpretation of simulation results through automated report generation

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