



## CASE STUDY

# HyperWorks CAE Process Automation Accelerates Product Development at Scania

### Overview

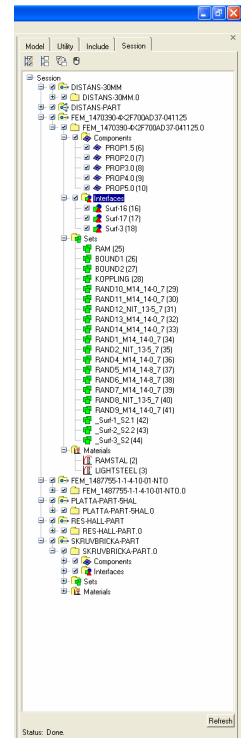
Scania chose HyperWorks – the Engineering Framework for Product Design – to automate the assembly process of virtual truck models for finite-element (FE) simulations. The new process significantly increased simulation efficiency and robustness, which are especially critical to Scania's truck-customization process.

### Business Profile

Sweden-based Scania CV AB is a leading global manufacturer of heavy trucks, buses and other heavy-duty engine applications. During 2006, a total of 65,000 vehicles was distributed in Europe, Latin America, Asia, Africa and Australia.

### Challenge

Scania is known for the ability to highly customize its products. Selecting from a large number of engine models, transmission systems and chassis, customers have the power to greatly individualize their trucks. This concept creates a significant challenge for computer-aided engineering (CAE) departments, as engineers must rapidly verify a number of different variants with FE simulations. Therefore, automating the entire virtual model assembly process was a major goal for Scania. The process, which included tasks such as positioning hundreds of components, creating contact definitions and building part connections with pre-strained bolts, was time-consuming and prone to error. In the past, Scania analysts used fully automated solutions, without the capability for user interaction during execution. However, without automation interactivity, Scania CAE analysts frequently were required to manually modify and improve the truck input models in a time-consuming process.



*“HyperWorks’ open programming architecture combined with its superior geometry handling and meshing capabilities make the Altair framework the right solution for us.”*

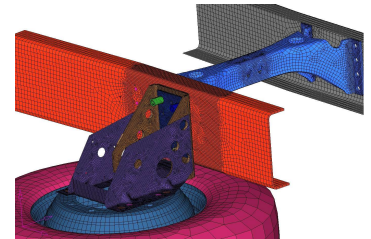
*Martin Edberg, M.Sc., M.E.  
Head of Chassis Department  
Scania CV AB*



## Solution

In order to build an automated process that also allowed for user interactivity, the HyperWorks CAE framework was chosen. The following technical advantages were identified in the thorough benchmarking process:

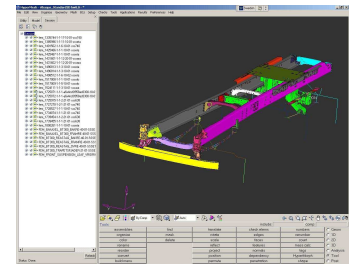
- Native computer-aided design (CAD) support, in combination with advanced mid-surface creation tools, to significantly reduce time prior to meshing
- Meshing tools for advanced solid geometries
- Comprehensive solver-neutral data model for easy conversion into various formats and elimination of manual edits
- Automation capability through HyperWorks' process automation engine
- Capability to interactively manage assembled FE models prior to job submission
- Quick performance of design alterations/optimizations without underlying CAD data through morphing



*Assembled truck part*

Based on the HyperWorks framework, a semi-automatic pre-processing manager was developed to meet the chassis department's special modeling requests. Some of the steps the HyperWorks Process Manager application performs during model assembly include:

- Reading CAD libraries and automatically selecting appropriate files
- Monitoring the FE and geometry libraries and giving notifications if changes are made
- Positioning components to their correct location in the chassis
- Cutting holes in geometries/meshes to prepare for bolt connections
- Generating "spider connections," solid bolts with pre-tension and contact definitions



*Example of assembled chassis*

## Benefits

- Improved quality of FE models
- Reduction of development cycle time as a result of the automated process
- A more consistent CAE process
- Increased flexibility during product development and CAE modeling

### **Altair HyperWorks**

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 Process Automation  
 Data Management

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