CUSTOMER STORY

SIMPLIFY AND SCALE FEA POST-PROCESSING

READ, MANIPULATE, CREATE, AND VISUALIZE CUSTOM SIMULATION RESULTS WITH ALTAIR COMPOSE®

About the Customer

Northrop Grumman Systems Corporation (NGSC) is an American global leader in innovation and technology for aerospace and defense. Located in Sunnyvale, CA is the marine systems division is a leader in the design, development and production of advanced naval systems.

Their Challenge

The current post-processing workflow entailed manually calculating combined stresses from NASTRAN results. What made this task especially time consuming was some system level models contained hundreds of 1D beam elements with varying cross-sections – each type of 1D beam

> “The Altair Compose script allowed a more streamlined, flexible and simplified workflow for post-processing beam stress results, providing the ability to generate stress reports and present large amounts of information in a simplified format.
>
> Doug Beattie
> Sr. Principal Structural Engineer
> Northrop Grumman Systems Corporation – Marine Systems

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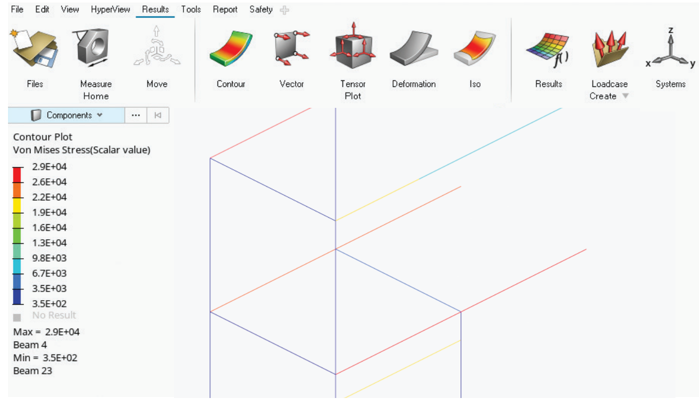
Altair Compose

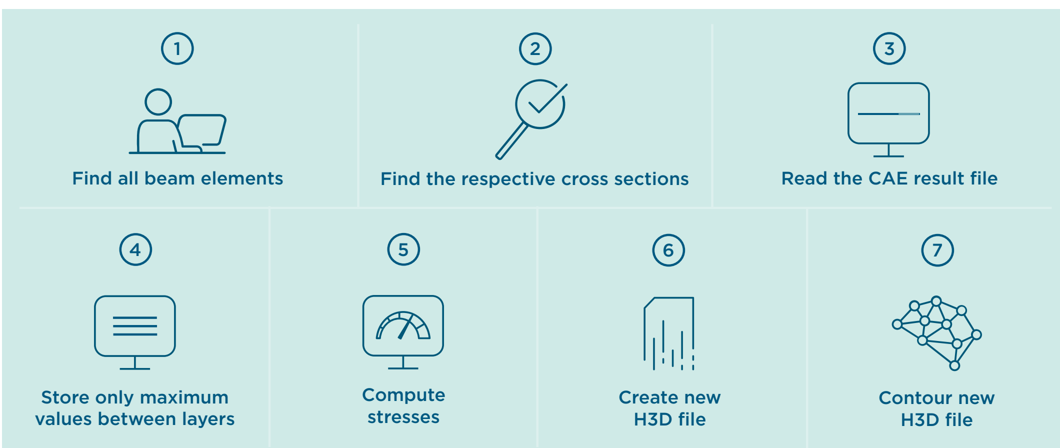


LEFT: Example of script shown in Altair Compose.
RIGHT: Sample model visualized in Altair HyperView.
BOTTOM: Automated workflow.

required their own set of calculations. The task was to automate this workflow such that time was saved and errors minimized with simple user inputs and to scale the process allowing a variety of models (e.g. cross-sections) to be post-processed.

Our Solution

Altair and NGSC engineer's collaboration to address this task began with a discussion of the current workflow, identification of pain points, and sharing of the necessary materials (e.g. equations, sample NASTRAN model and results). Based on this Altair engineers determined which solution would best address the pain points and objectives. Altair Compose was selected because of its broad library of FEA results readers – based on the readers developed for Altair® HyperView® and Altair® HyperGraph® – and the community's familiarity with the Open Matrix Language, an open-source computation programming language that leverages the same syntax as GNU Octave and other similar software. A "template" script was provided to the NGSC team which read in their model and results files (namely the "readbdf" command was used), modified the data per the provided engineering equations, and output a custom results file which could be visualized in HyperView. With a little more collaboration NGSC engineers were able to modify, expanded, and apply the script to their production level post-processing.



Results

Altair Compose is able to quickly read FEA results, process and manipulate the data based on the defined operations, and output new results. These may also be visualized in other Altair solutions – HyperView or HyperGraph. Due to this all of the pain points and goals were addressed. Furthermore, the script is editable, the solution is repeatable, and errors can be more easily identified. It is a success because through collaboration pain points and objectives were clarified, the correct solution was identified early on, and both Altair and NGSC engineers remained in regular communication.

To learn more, please visit altair.com/compose