

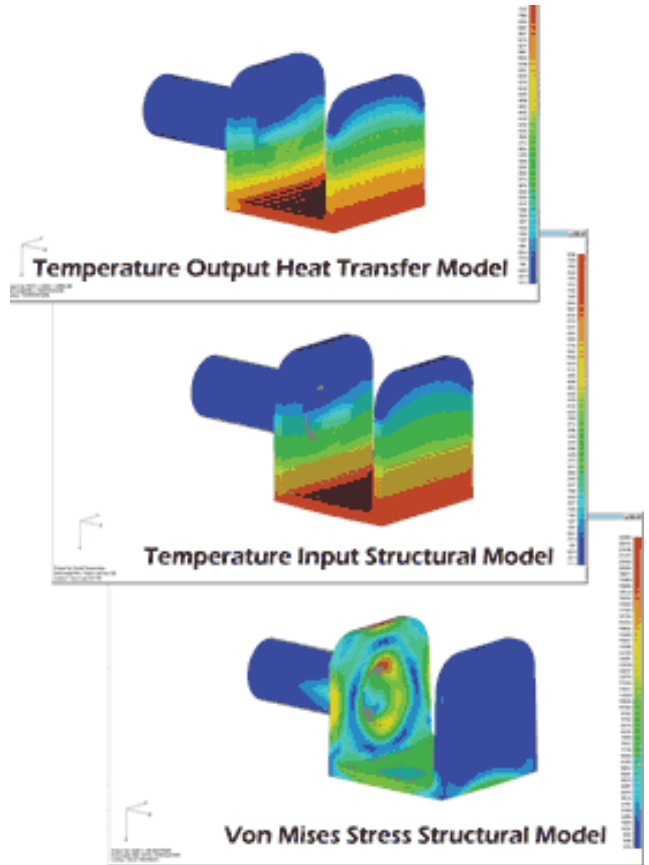
# Simulations sync up

The finite-element analysis program NE/Nastran V8.3 now maps results from one mesh to another. Mapped data can include temperatures, displacements, internal forces, and moments.

For example, temperatures from a thermal simulation can map onto a similar NE/Nastran model with a different mesh for structural analyses. This juxtaposition works on 2D and 3D models.

Mapping creates a smooth interpolation of 3D data at scattered nodes in model space. And there's no alignment required between the input data to be interpolated and target mesh. "Mapping is based on the input data and analysis mesh located by the FEA program," says Tony Abbey, technical manager at [Noran Engineering](http://www.nenastran.com), Los Alamitos, Calif. (www.nenastran.com).

"Interpolation takes place in the solver," says Abbey. "This reduces time spent processing data before analysis." The input-data region and target mesh can be different sizes and orientations. The mapping feature lets users take, say, displacements from a



**Results in the top image are from a thermal analysis. Using NE/Nastran V8.3, the temperatures from this coarse mesh have been mapped onto the denser mesh of the middle image. The bottom model shows stresses generated by the thermal load.**

coarsely meshed FE component and map them to a small region on another model -- one with a notch, for example. This practice is often referred to as Global Local Modeling. The capability eliminates a lot of user intervention and data setup.

The mapping works on dissimilar 2D or 3D models. Even the model formats may differ as they would if thermal data came from a Sinda (thermal) simulation. The feature is bidirectional, so results from the second model can map back onto the first. This is most useful in fluid-structure interactions where fluid flow changes a part shape, such as a wing, which changes the flow pattern.

Users can see interpolated data before use to verify validity. The capability also allows using several data sets. This allows mapping different results to see stresses change with operating conditions.