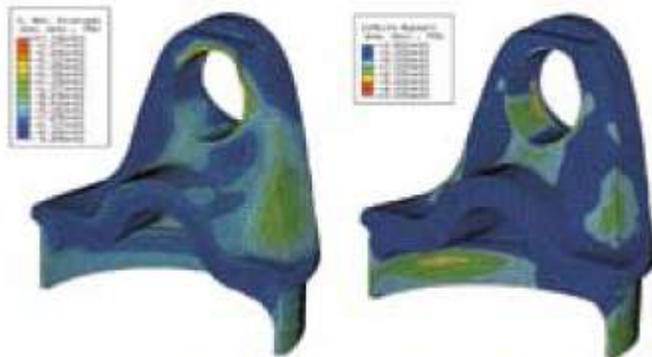


# Advanced Fatigue Life Analysis using Abaqus and fe-safe

Manufacturers are increasingly driven to improve profitability, increase market share, and reduce the environmental impact of their products by improving the reliability and durability of lighter weight designs and high performance materials. While many companies are well-versed in using finite element analysis to calculate stresses and thermal loads, fatigue studies are often performed using spreadsheet analysis of a few manually selected stress points or by performing time-consuming physical tests.

Safe Technology Ltd is a SIMULIA Software Alliance Partner that develops fe-safe, a highly effective tool for leveraging Abaqus results to accurately predict durability under complex load conditions.



Images courtesy of Dana Corp, Automotive Systems Group, USA.

In an example of an end-yoke component, the principal stress approach (left image) identifies the hotspot on the outer right side of the part. However, the log-life results from fe-safe (right image) indicate that the area with lowest predicted life is the inner cylindrical tube area at the lower left side of the component. The analysis results were corroborated by lab tests.

The software automatically identifies fatigue hotspots based on Abaqus results and provides accurate life predictions for complex multiaxial load histories. Three dimensional contour plots can be displayed for fatigue life and for allowable stress factors for a specified design life. fe-safe also provides a direct interface for reading and writing results data to the Abaqus output database (.odb) file, which enables Abaqus users to examine fe-safe fatigue results within Abaqus/Viewer.

fe-safe 5.4-04 offers introduced many new features and enhancements including enhanced data handling, usability and analysis methods, speed improvements, new file interfaces as well as a new release of the Verity® in fe-safe™ add-on module.

fe-safe supports Abaqus Version on Microsoft Windows and Linux platforms. When used in combination with Abaqus fe-safe is capable of reducing time and costs while providing accurate fatigue-life evaluation of components. As the authorized distributor for Safe Technology Ltd, SIMULIA provides experienced and knowledgeable support staff. For more information on leveraging fe-safe, contact your SIMULIA or EDS regional office or visit the SIMULIA website.

## For More Information

[www.simulia.com/products/fesafe](http://www.simulia.com/products/fesafe)

[www.safetechnology.com/fe-safe.html](http://www.safetechnology.com/fe-safe.html)

[www.edstechnologies.com](http://www.edstechnologies.com)