esrd Engineering Software Research & Development, Inc.

ESRD, Inc. is the developer of StressCheck®, the world's premier high definition simulation tool

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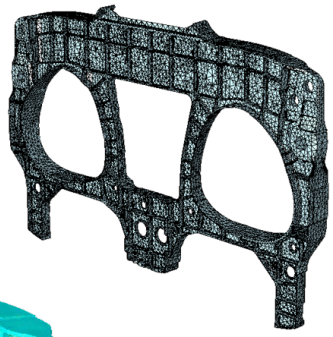
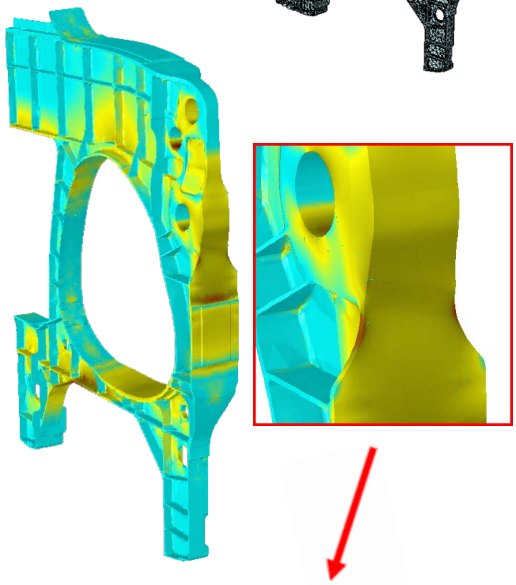
High-Fidelity Aircraft Stress Analysis in Support of DaDT

ESRD's StressCheck® numerical simulation software is used across the aviation, aerospace, and defense industries to solve the most challenging structural analysis problems. The underlying technology enables high-fidelity analysis that is **S**imple, **A**ccurate, **F**ast, **E**fficient and **R**eliable (**S.A.F.E.R.**), especially when compared to legacy-generation FEA methods, software and models.



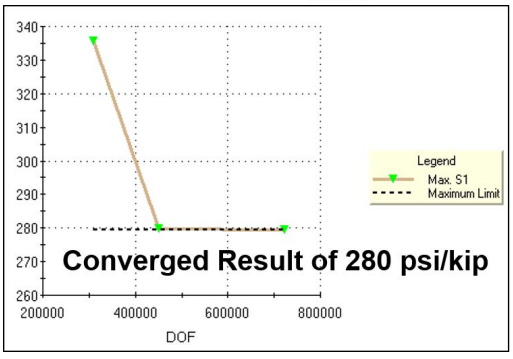
The Engineering Challenge

The objective was to compute the max 1st principal stress in the bulkhead wing attachment region to determine the part's susceptibility to fracture failure. The original stress analysis was performed using the mesh shown. A single solution run predicted a maximum stress of 335 psi/kip in the region of interest. How can the max stress result be efficiently and reliably verified as accurate?



The Simulation Solution

The mesh was imported into StressCheck, and a quick convergence study was performed to increase the degrees of freedom (DOF) of the solution without changing the mesh. As a result, the prior FEA solution was found to be 20% larger than the converged solution value of 280 psi/kip predicted AND verified by StressCheck! By using StressCheck's automatic solver capabilities, the reliability of the bulkhead solution was known throughout the entire model without averaging, interpolating, or extrapolating, regardless of the mesh or element type.



The Value

Aircraft are commonly being flown well past their original expected service life, and the value from improving the productivity and reliability of DaDT analysis functions to support the inspection, maintenance, repair, and life-extension of today's aerostructures is substantial. StressCheck was designed to support verification and validation procedures to enable the practice of Simulation Governance by encapsulating complexity, improving productivity, and ensuring reliability for the expert simulation analyst as well as the non-FEA expert DaDT engineer. That's what we call S.A.F.E.R. Simulation.

Learn more at esrd.com/about/safer-simulation

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