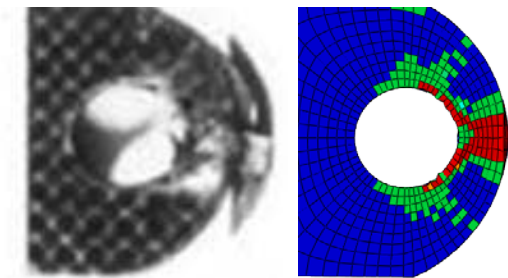




Enable Better Engineering Decisions with Helius:MCT

IN THIS ISSUE:

A Look at Effectively Analyzing Failure Modes in Composite Parts



Helius:MCT is an add-on for Abaqus™ and ANSYS™ that is specifically designed to enhance the finite element analysis of composite materials.

Its progressive failure capability enables the prediction of initiation **and** propagation of matrix/fiber failure, providing accurate insight into composite failure modes.

Example Scenario:

Field tests have revealed multiple bolted joint failures of a composite control rod in a small training aircraft. The part is a new design and is constructed of both unidirectional and woven composites.

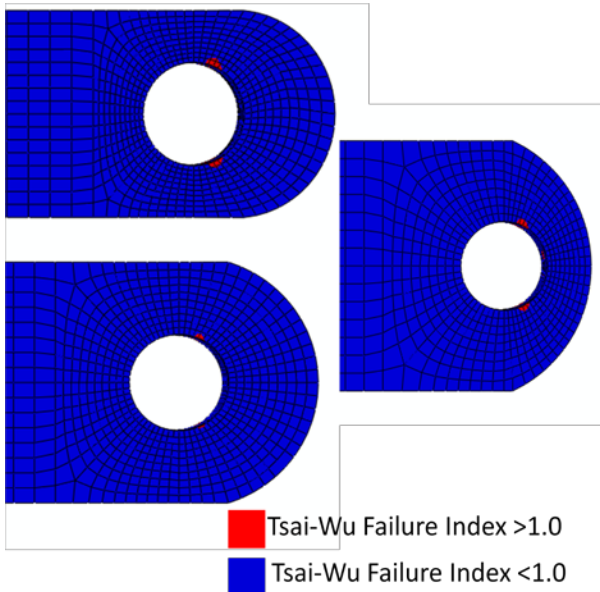


The design team develops 3 new geometries to address the problem.

The lead structural analyst of the design team needs to understand the failure behavior in each part in order to approve a new and improved control rod.



Traditional Analysis – First Ply Failure



Results:

- First Ply Failure occurs at nearly the same location within the control rod for all three geometries
- There is almost zero correlation between analysis and test.
- The failure mode cannot be determined. Which geometry is best for catching failure before it becomes catastrophic?

Helius:MCT Analysis – Progressive Failure

Results: Progressive failure analysis correctly captures the failure mode in all three geometries.

Now a real design decision can be made on which geometry results in a failure mode that is not catastrophic (WD25) and could be noticed and repaired/replaced early with regular maintenance and visual inspection.

