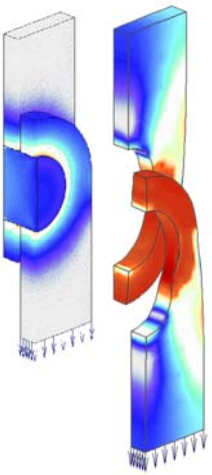

7-Step FEA™

Finite Element Analysis Performance & Validation System

1. Objectives – Per Company Goals & Data

a. Physical Reality & Data Collection
b. Company Goals & Project Objectives
c. Project Constraints

Revisions

2. Idealization – Of Physics-based Event

a. Structural Idealization
b. Spatial Idealization
c. Event Idealization
d. Nonlinearities

3. FE Model – The Numerical Approximations

a. Solution Type Selection
b. Element & Formulation Types
c. Discretization, or "Mesh"
d. Material Property Functions
e. Multi-Body Contact Interactions
f. Kinematics of Rigid or Flexible Bodies
g. Loading & Constraint Set Schema

4. Calculation – The Nonlinear Solution Strategy

a. Solution Iteration Scheme
b. Solution Convergence Criteria
c. Processing Completion Criteria
d. Solution Monitoring, Real-time
e. Output Variables & Frequency

5. Validation – Of Computational Model

a. Software Benchmark Testing
b. Software Operation Competence
c. FEA Procedure Qualification by Experience Base
d. Partial Post-processing & Interpretation
e. Computational Model Evaluation & ***Iterations***
f. Computational Model Acceptance by Analyst

COMPUTATIONAL MODEL

Model Validation

Solution Evaluation

6. Evaluation – Of FEA Project Solution

a. Partial Post-processing & Interpretation
b. FEA Project Solution Evaluation & ***Iterations***
c. FEA Project Solution Acceptance by Analyst

7. Presentation – Of Credible Project Conclusions

a. Complete Post-Processing of Final Results
b. FEA Project Conclusions & Design Details
c. Graphical & Numerical Proof of Analysis Validity

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