MPAVE, FEM based GUI

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Factors to consider in Component Standardization and Certification

- Developing a Standard that is open ended in complexity but rigorous in its practice.
- Building on accepted Software practices
- Verification and Validation to include experiment

History of ASME Standards for Pressure Vessel and Piping, Design by Computing

- Built in flexibility, Governs allowable computing procedures in linear and nonlinear behavior. Choice of complexity of analysis is placed on designer. Each degree of complexity results in savings in cost.
- Models mainly thin shells , interpretation procedures specified for computed results. Protection against discretization errors.
- Later extensions to high temperature design by adoption of standard ORNL material

Present day FEM practice, GUI based

- CAD Centric, parts and/or assembly
- Creates mesh
- Applies Boundary Conditions.
- Sends model for Analysis
- Post -processes results.
- Iteration of above for component testing and hence Verification and Validation

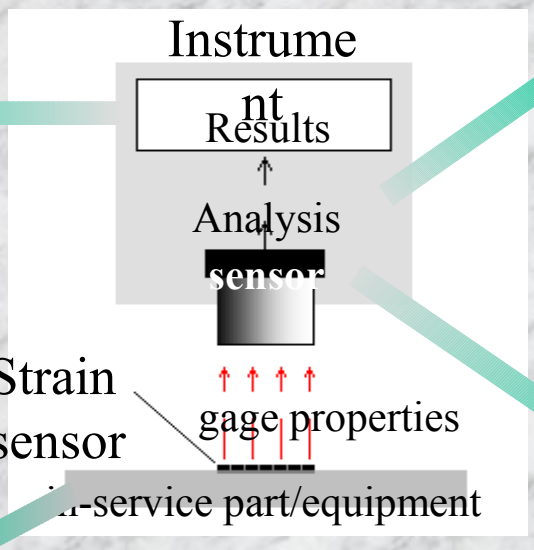
Verification and Validation questions

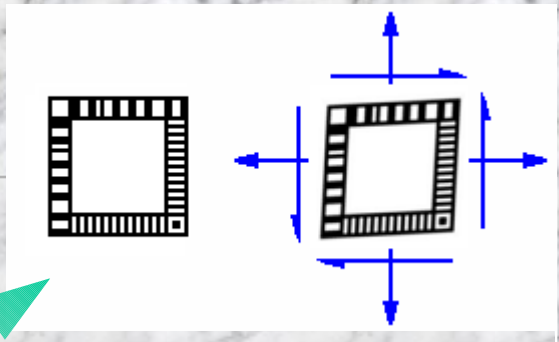
- Role of Statistics, multi-model, multi-Language
- Role of Experimental Verification, new method of Strain measurement allows reading over lifetime of components.

How it Works …

Laser based measurements

System controls analysis, display, and integration tasks





Gage is analyzed for strain

In-service part marked with gage

Handheld unit “reads” gage