IBS Engineering GmbH introduces a method for the 3D pipe model design and display that is applied for the plant engineering to simplify FEM Computations.

IBS - Pipe

- Loads of Wind, Snow and Inner Gas Pressure, Inner hydro static Gas Pressure, Gravity and Temperature are recognized.
- Slide Bearings and Fix Points are recognized as Boundary Conditions.
- Receiving Points, circumferential and longitudinal stresses can be achieved.
- The FEM - Model is made of shell elements.

Numerous special software for calculation of pipes is commercially available having the advantage to be fast for small and simple 1D element models. Stresses on models with 1D elements can be calculated only on the nodes and not on the surface because the 1D elements do not have any surfaces and circumferential stresses can not be calculated so that for the bending loads some erroneous results can be calculated.
Hence for local surface investigations 3D element models are needed.

By means of the model Builder IBS Pipe and with a little effort it is possible to make an exact shell model that can be solved by any FEM Software. The input for IBS Pipe is a simple script file. The output of IBS Pipe is a FEM-Input-File favourably a NASTRAN Input Deck.

The advantage is a little effort to make the model. The results with both circumferential and longitudinal stresses are useful for local stress investigation and also for global evaluation.

„The Advantage of IBS Pipe compared to the known pipe calculation software is the possibility of a more accurate analysis of stresses and their location. It is because the IBS Pipe makes 3D shell models while the other software use 1D elements. Using the IBS Pipe for calculation of pipes with a composite (FRP) material one can take care of local enforcement."

Dipl.-Ing. Bernd Patzelt †, TÜV Industrie Service GmbH

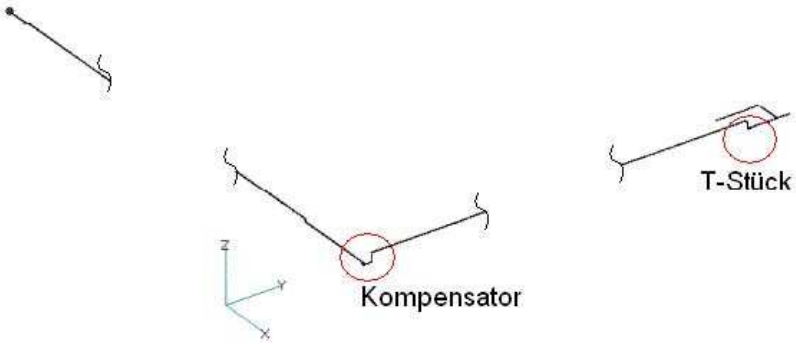

Fig. 1: Pipe model, calculated for TÜV- Süddeutschland

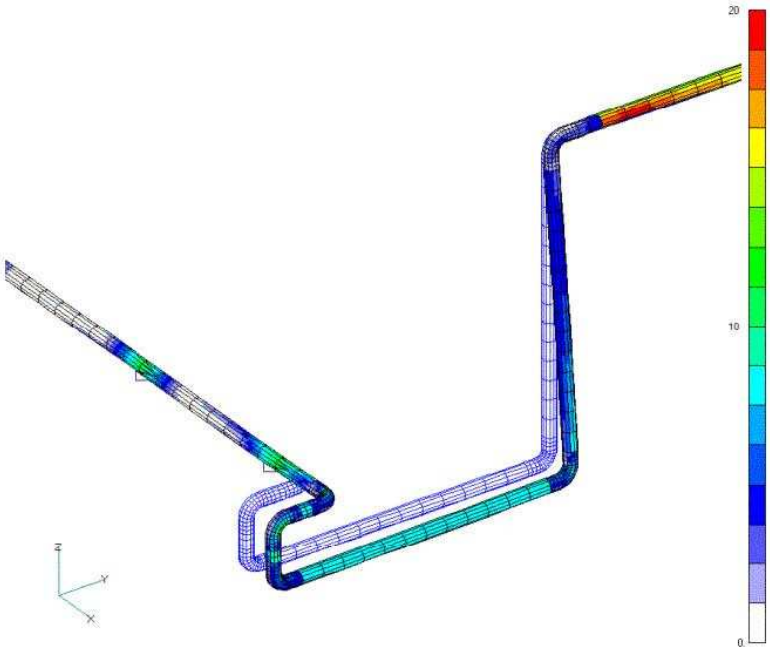

Fig. 2: Stresses of a compensator

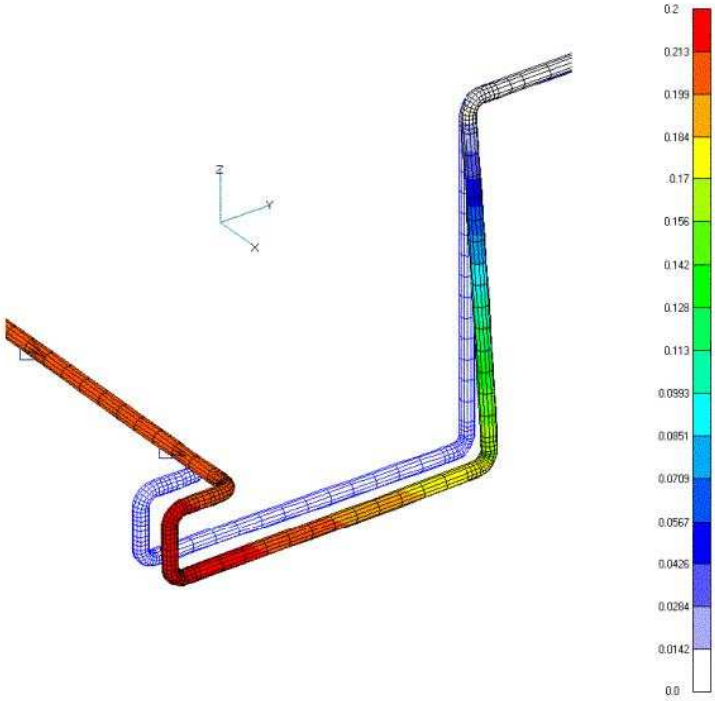

Fig. 3: Deformations of a compensator

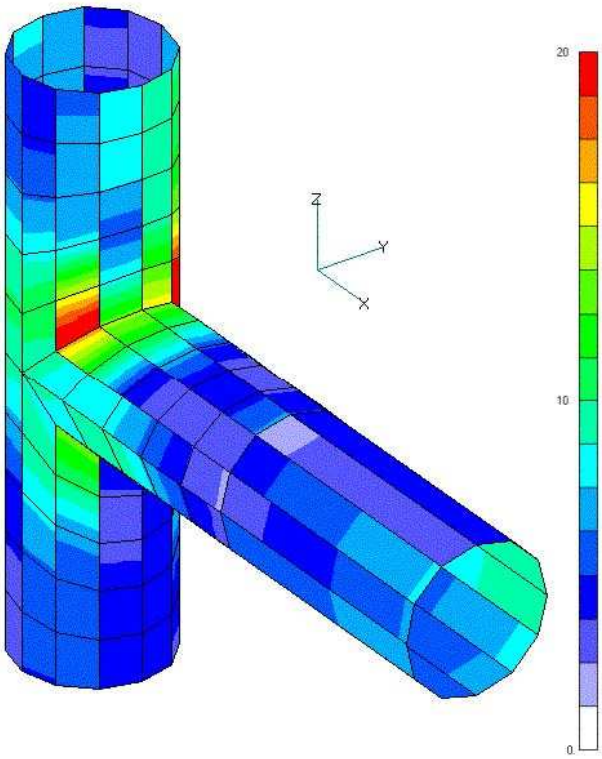

Fig. 4: Stresses of a T