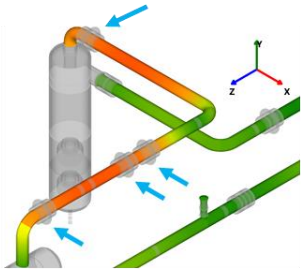
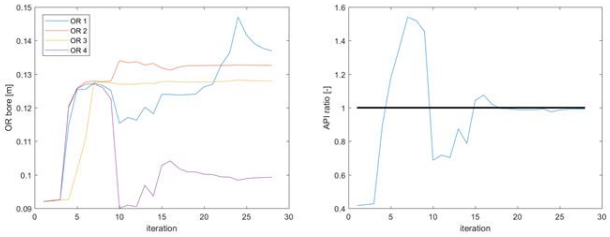
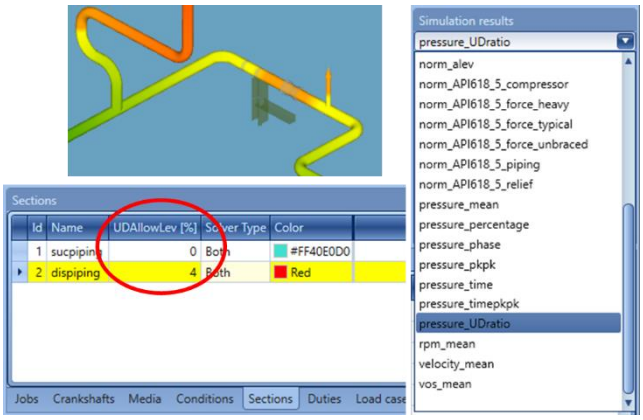
PULSIMSUITE NEWSLETTER

This is the PulsimSuite newsletter of Q4, 2021, presenting version 2.3. With your feedback, we have implemented new functionality of which we give you a brief overview here.
With this release 2.3, we also introduce the 2-core acoustic solver as part of the basic PulsimSuite AC license, without additional cost. This means twice the simulation speed for the time-domain pulsation simulations in PulsimSuite! Moreover, all current users are invited for a free 3 months' trial of the 4-core acoustic solver. Note that the PulsimSuite acoustic solver offers up to 16-core parallel computing.

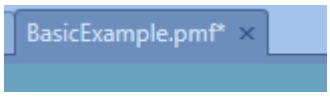




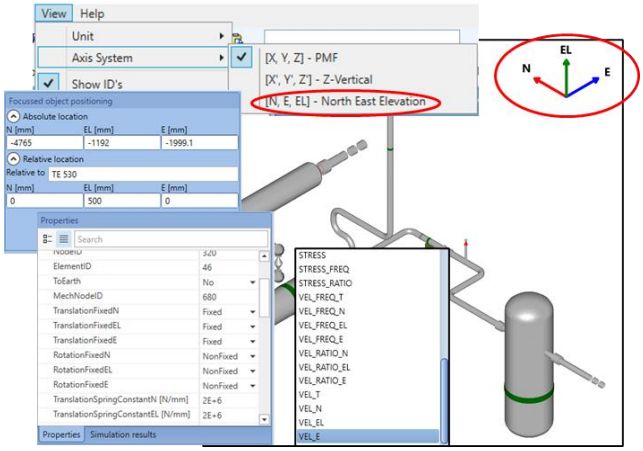
A new functionality in PulsimSuite is the **Multiple Orifice Optimizer**. With this module, you are able to resolve pulsation issues at several frequencies in one go, applying several orifices. The Multiple Orifice Optimizer makes it possible to optimize several orifices simultaneously, reducing pulsations (or ratio with API, or shaking forces, etc.) in specified parts of the system, at specified deviations, to specified target levels. So multiple orifices are optimized to comply with multiple objectives, in one optimization run.
This optimizer uses the Dakota framework of optimization routines. Dakota is an open-source C++ toolkit, which we have integrated in the PulsimSuite installation.



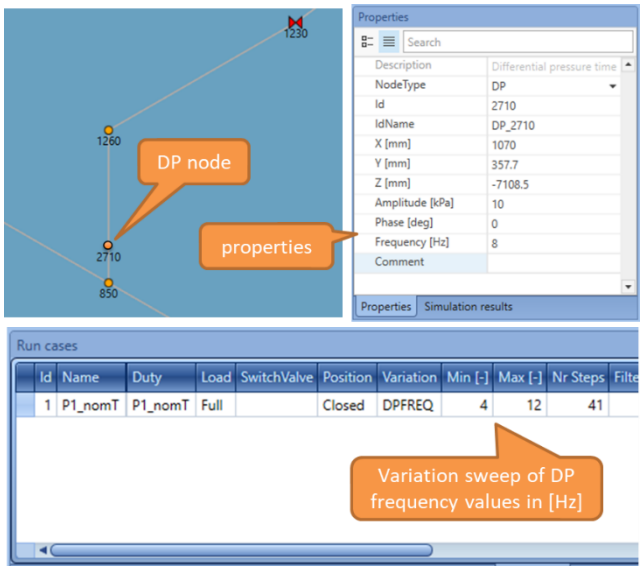
For Sections of your pipe system, you can now specify a user-defined allowable level (**UDAllowLev**) for the peak-to-peak value (of the time signal, so not per frequency component) of pressure pulsations. This allowable level is defined as a percentage of the local mean pressure, and this criterion will be applied to all pipes of the Section. The default criterion API618/619/674 will still also be available. A new result file **pressure_UDratio** contains the ratio of pulsations with the user-defined level. Similar to the default api_ratio results, the coloring of pressure_UDratio is such that a ratio between 0 and 1 gives green to yellow color, and values from 1 to the maximum give a color from orange to red. Note, also, that the model name has been removed from the displayed result types in the **Simulation results** tab. This improves the readability of the table of results.



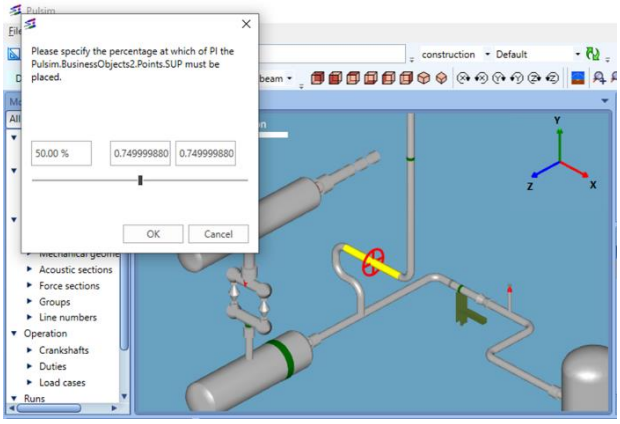
A model that was modified, but not yet saved, is now (finally!) indicated by an asterisk * with the model name in the GUI tab.



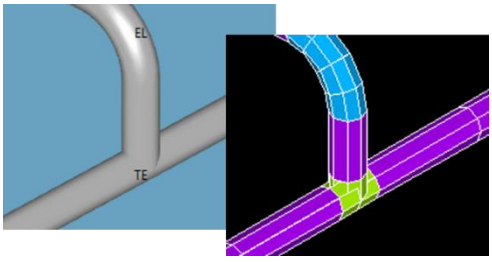
Similar to switching the unit system, you can now select two new axis systems: “Z-vertical” and “North-East-Elevation”. This will ease the modelling for clients who are accustomed to using one of these alternative axis systems. Most isometric drawings, for instance, have their co-ordinates specified in a North-East-Elevation axis system.
All co-ordinates, properties, results, and reports will be shown in the selected axis system directions. You can switch at any moment during modelling or during the analysis, because the GUI axis system setting has no influence on the .PMF or .PSR files. Model and results remain stored in the PulsimSuite (“PMF”) axis system.



A new pulsation source in PulsimSuite is the DP node. This node creates a harmonically varying pressure difference over the node. This represents the effect of a flow-induced pulsation (FIP) source. FIPs may occur at tee branches where the gas velocity past the tee is high. Flow instability (vortex shedding) at the tee then introduces pressure/flow fluctuations that propagate into the pipe system. If the frequency of these pulsations matches an acoustic resonance frequency of the piping, strong amplifications may cause high pulsation levels and pulsation-induced forces, which may lead to fatigue failure.
If you know the frequency and strength of the FIP, the DP node in PulsimSuite can be used determine the FIP’s effects (in terms of pulsations, forces, vibrations, and cyclic stresses) on the pipe system.



When adding an object (e.g. a SUP point) to a pipe, the “crosshair position” pop-up is now placed in the top left corner of your screen. This way, the pop-up is not blocking your view on the pipe anymore.



The tee (TE) node representation in the mechanical (ANSYS) model is now implemented according to the code ASME B31J, so that flexibilities and Stress Intensification Factors are more accurate.
The elbow model in ANSYS now also contains the pressure stiffening effect.

For more information, support or your feedback, please contact us: **pulsimsupport@tno.nl**
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