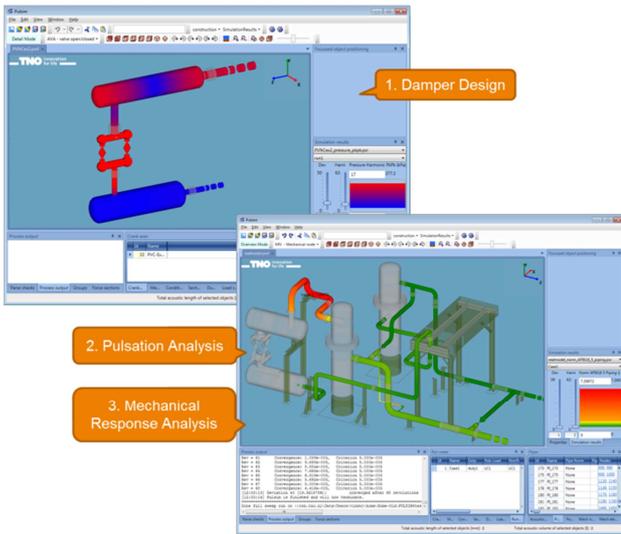


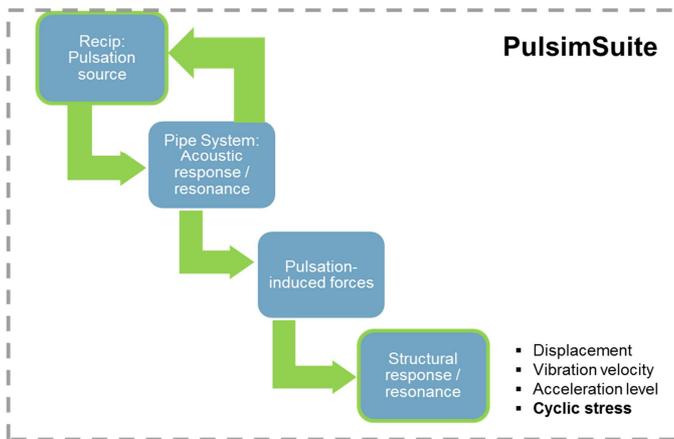
PULSIMSUITE NEWSLETTER

This is the PulsimSuite newsletter of Q2, 2016, presenting version 2.1 that was released in May 2016. We give you a quick-and-short overview of this wonderful API 618/674 pulsation & vibration analysis software toolbox, and proudly present the latest developments. With PulsimSuite2.1, doing API studies has been converted from a specialist's job to a common engineering activity. Please have look at the information below, and let us know what you think!



PulsimSuite2 covers the full API 618/674 workflow. It starts with the damper design, followed by a pipe system pulsation analysis, and a full study of the mechanical response of the pipe system including supporting structures and equipment. All this is modeled, simulated, and analyzed in our unequalled PulsimSuite2 graphical user interface.

Visualizing the results, you get an API compliance check at-a-glance, giving you an overview of the entire system. The hover-and-click functionality helps you quickly find resonant modes (both pulsations and vibrations) from large sets of simulation results. And the resonance is visible at once, all over the pipe system.



Our time-domain solver accurately simulates the source of pulsations (piston motion inside the cylinder), and also represents the feedback from pipe system pulsations back to the cylinder, via the opening and closing cylinder valves.

You can check the API compliance of pulsation-induced shaking forces by visualizing those results, and PulsimSuite supports the Design Approach 3 mechanical response analysis. Just click the "run" button, and an intelligent algorithm will select worst-case acoustic conditions, and run the harmonic response simulations (ANSYS is used on the background). The results of this analysis are also directly available to visualize on the pipe system.

2.1.14 Summary of reaction forces and moments

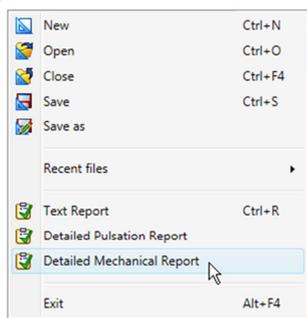
2.1.15 Please compare the following reaction forces with the ones from static calculations.

Table 2.15 - Summary of reaction forces in X direction

Supp. Nr	Fx	Fy
	Case 1	Case 2
SUP_590_MID	0.00	0.00
SUP_550_MID	0.00	0.00
SUP_620_MID	0.00	0.00
nearPSV_SUP_710_MID	0.01	0.01
FL_180_START	0.00	0.00
SUP_640_MID	0.26	0.48
SUP_590_MID	0.00	0.60
SUP_650_MID	0.16	0.21
SUP_610_MID	0.12	0.15
SUP_630_MID	0.23	0.24
FL_70_MID	0.00	0.00
beam_SUP_660_MID_RIG	0.11	0.09

Table 2.16 - Summary of reaction forces in Y direction

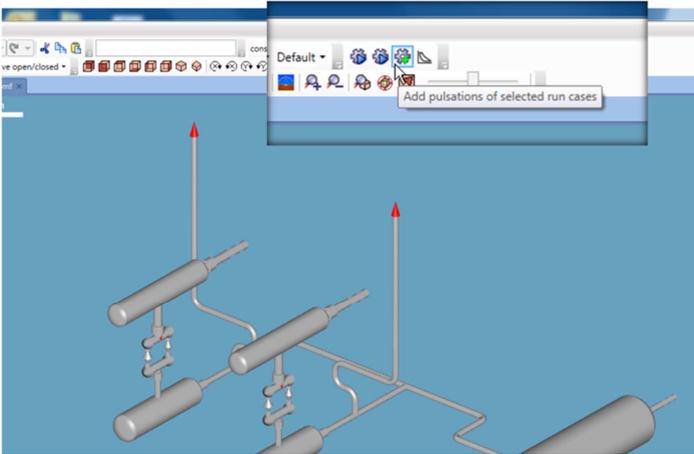
Supp. Nr	Fx	Fy
	Case 1	Case 2
SUP_590_MID	0.36	0.82
SUP_550_MID	2.61	0.72
SUP_620_MID	0.25	0.27
nearPSV_SUP_710_MID	0.36	0.36
FL_180_START	1.02	0.28



With PulsimSuite, you can generate a (Word) document that reports all simulation results. Tabular overviews are given of the maximum pulsations, shaking forces, ratios with API, etc., Overviews of maximum results are presented over the selected operating conditions, but also detailed results per case.

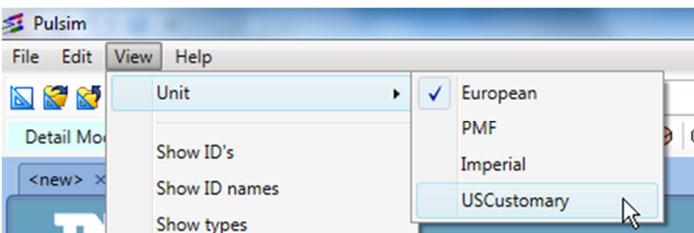
In this document you will also find the PV charts of the cylinders, with an indication of the machine's power consumption.

The mechanical report will, apart from vibration - and stress levels and compliance checks, show you tables of reaction forces and - moments on supports, each support easily recognized by the label you have given it.

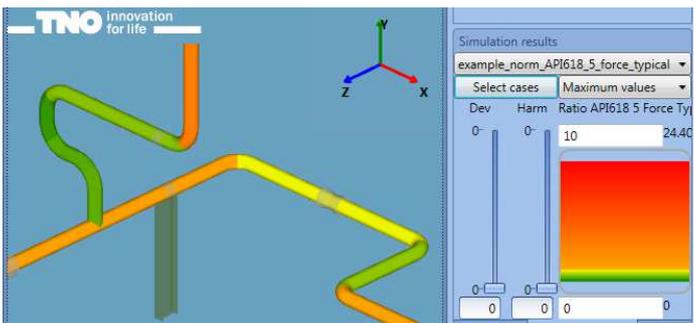


When two (or more) different machines are running in parallel (or in series), the pulsations of the combined operation can be handled straightforwardly. PulsimSuite is taking into account that machines driven by independent drivers may have the same speed, but their phase relation is undefined.

With the “add results” button, pulsations caused by independent parallel/serial machines can be added. The resulting pulsations are automatically compared to the adequate (increased) allowable level, as stipulated by API. Of course, the pulsations due to the individual machines are still compared to the normal API allowable level.

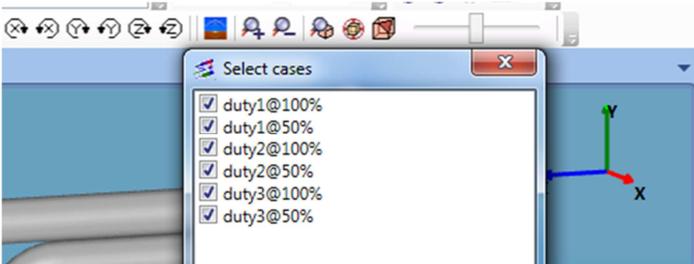


PulsimSuite can switch from one unit system to another, on the fly. After switching, all values of quantities you see (length -, pressure -, etc. values, coordinates, result values) will be shown in the selected unit system.

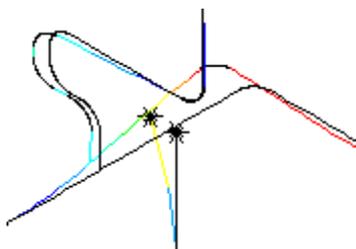


New in PulsimSuite 2.1 is the API compliance checking of dynamic, pulsation induced shaking forces on all pipe sections in the system. Just like the pulsation level evaluations, the colors green to yellow are values from 0 to API level, and orange to red represent (just above) API level up to the maximum found.

Of course, you can also still see the peak-to-peak shaking forces themselves (in kN or lbf), over the entire frequency range.



The new results visualization “case selector” makes it possible to filter out operating cases that predominate all in the results visualization. Disregarding those dominant cases may reveal other significant pulsation -, shaking force -, vibration -, or stress levels at other frequencies, for instance, that thus indicate other (apart from the predominant ones) acoustic/mechanical resonances that may need mitigation.



PulsimSuite’s Mechanical Module uses ANSYS* on the background. A modal analysis is the first step in an API mechanical response analysis. The mode shapes can be visualized as colors in PulsimSuite, and the shapes are also saved as pictures, which sometimes give a better understanding of how the structure moves.

* The PulsimSuite license does not include the ANSYS license, which needs to be procured separately from ANSYS.