



Intergraph PV Elite Vortex Shedding and Dynamic Wind Analysis Capabilities

We have been asked by a number of clients when Vortex Shedding should be activated within PV Elite. We hope to provide some clarification in this brief article.

Vortex shedding occurs mainly in a tall vertical vessel which subjects the column to cyclic pressure differences on either side of the vessel. If the period of these pressure differences coincides with the natural frequency of the free standing tower, then the amplitude of the deflections can be excessive, rendering the tower unstable.

These large cyclic deflections can cause large longitudinal stresses to be experienced in the lower sections of the tower with correspondingly high bolt loads in base rings or legs. Under these conditions, the tower is said to be excited. It is rather like pushing a child in a swing where the push is given at the natural frequency of the child in the swing, and the amplitude grows with each push.

Now, the tower has natural damping from internal friction and other factors such as insulation, internal liquid and attached pipework etc. It is interesting that the platforms themselves serve as a damping device.

Within PV Elite, the user is given the option of checking or un-checking the vortex shedding button. First, see if the vortex shedding frequency is near to the natural frequency of the tower. Vortex shedding frequency is associated with a wind speed thus if the frequency of the vortex shedding is critical at a wind speed that the tower is expected to experience, then it is wise to check the box to include vortex shedding.

When using a wind code, PV Elite follows the procedure set out in the respective design code (many are included within the software). There is no control over whether the analysis is static or dynamic; this is determined by the natural frequency of the column which is detected automatically by PV Elite and the analysis is carried out accordingly.

If you have any further questions, please visit our website or contact our technical team at Fern.



www.ferncc.com
support@ferncc.com
Telephone: +44 (0)1332 780790
Fax: +44 (0)1332 780788

