Bladed - Zero Tower Deflection with Steady Wind

Zero Tower Deflection with Steady Wind

Similar to the previous tutorial, Zero Blade Deflection with Steady Wind, the tower modes can be set to zero to simulate a wind turbine with zero tower deflection. We will use the Bladed demo project again and adjust the input parameters. The wind condition will be the same as the case with zero blade deflection (steady wind, 11 m/s).

Start-up

Launch GH Bladed and load the demo file (demo_a.prj).

Wind

Click on **Wind** to edit the wind characteristic. The default wind is set to *3D Turbulent Wind* with a mean wind speed of 12 m/s. This turbulent wind is defined in the demo wind file. For our case, we will use a steady wind of 11 m/s. Change the option to *No Variation* and change the *Wind speed* to *11 m /s*. Change the *Flow inclination* to *0 degrees*. Click on Apply to save the changes.

Tower Modes

Double click on *Modal Analysis*.

Change the number of tower modes to *0*. Click OK to close the Modal Analysis Parameters window.
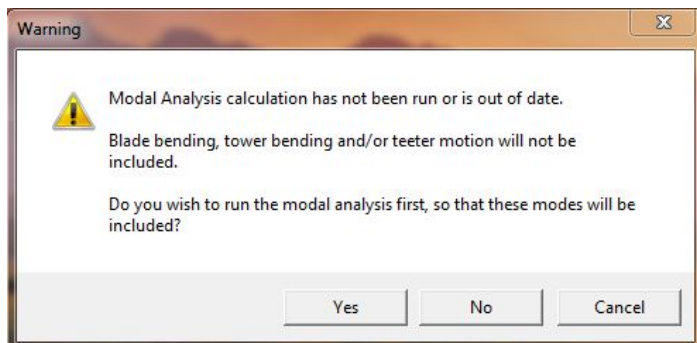

Simulation

We will run *Start* simulation because it simulates the start up response of a wind turbine. Highlight *Start*, and click on *Run Now*.
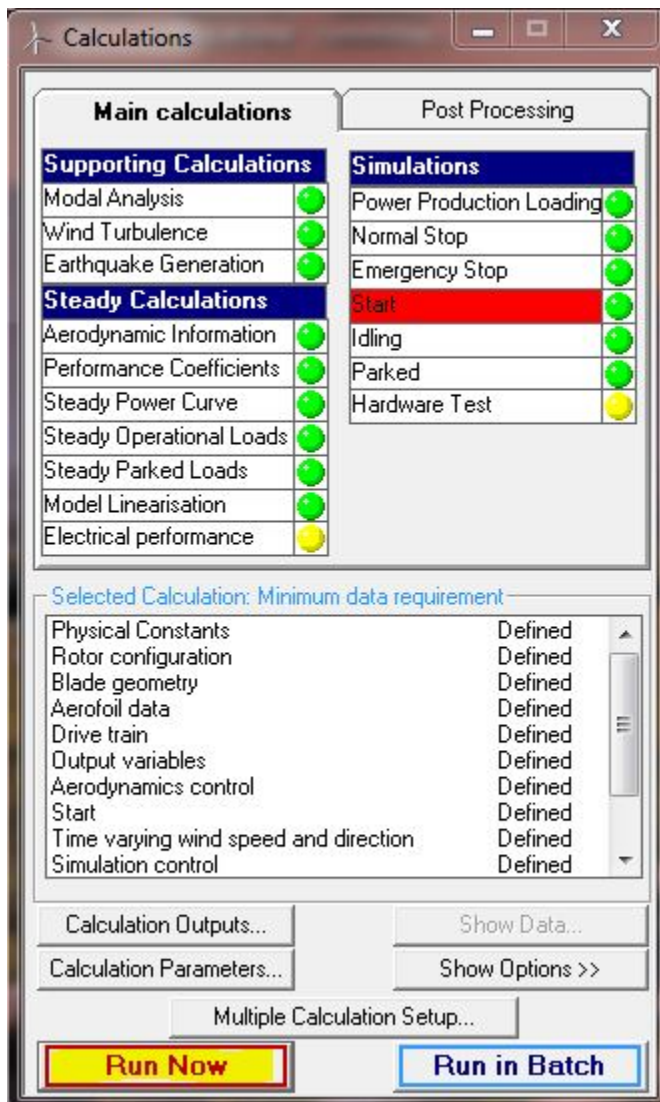
A warning message will appear. This message appears because we have changed the blade modes. Click on Yes to update the modal analysis to proceed.
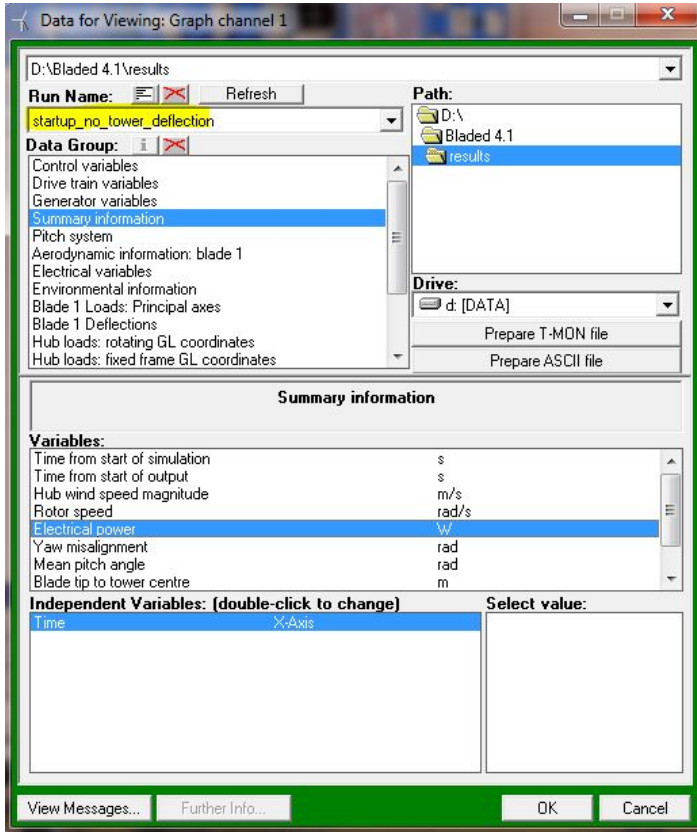

Save the simulation result in the Bladed result folder (bladed 4.1\results). Name it ***startup_no_tower_deflection***. Close the Calculation Progress window when the run is completed.
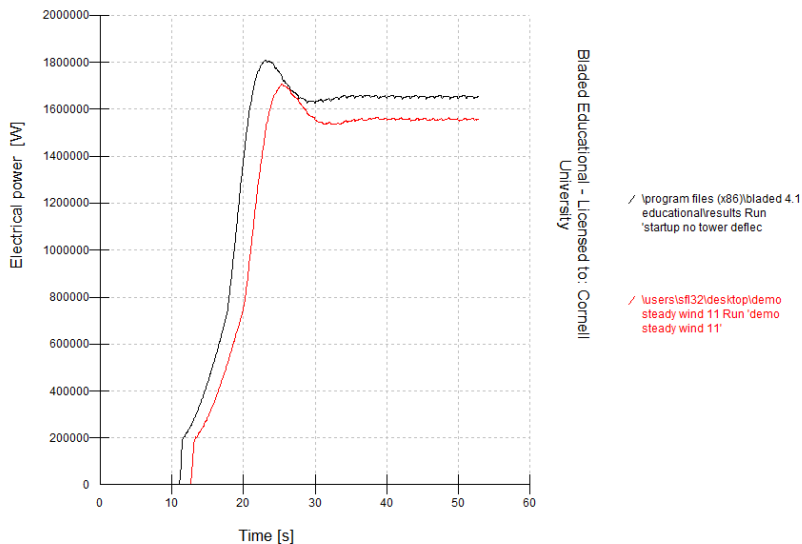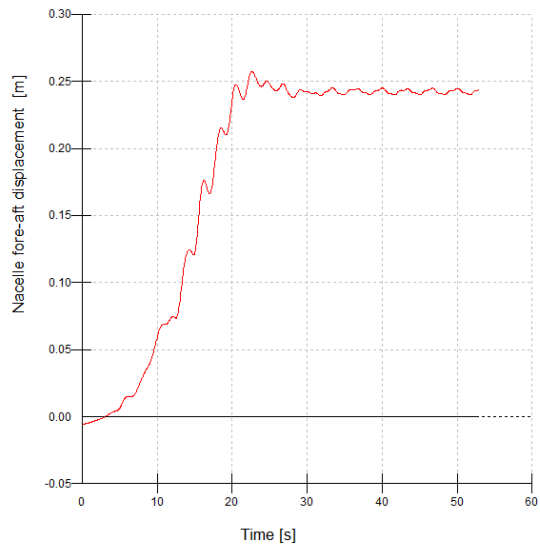
Results

Click on Data View.

In Channel 1, select *Electrical power* from *Summary information* for "startup_no_tower_deflection.

Select the same variable and independent variable for channel 2, but select "demo_steady_wind_11" for *Run Name*. Click on View Graph:

You can also check the Nacelle motion by selecting *Nacelle Motion* in *Data Group*. Select *Nacelle fore-aft displacement* for Variables and *Time* for independent variable. The nacelle displacement will look like the following:

Nacelle fore-aft displacement [m]

Time [s]

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\program files (x86)\bladed 4.1 educational\results Run 'startup no tower deflec

\users\sfl32\desktop\demo steady wind 11 Run 'demo steady wind 11'