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Freq. Dependent Modules

PSS®SINCAL

Enhanced analysis of frequency-dependent procedures in electrical networks

These calculation methods help you to examine frequency behavior in electrical networks. The following frequency-dependent modules are available:

- Harmonics
- Ripple Control

Harmonics

PSS®SINCAL's Harmonics module calculates the harmonic distribution in electrical networks as well as the frequency response.

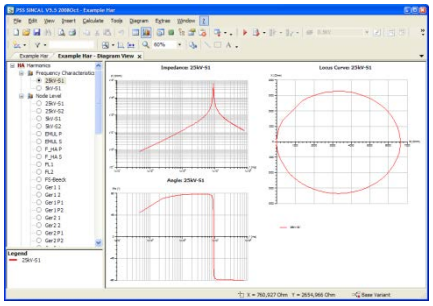

Figure 1: Harmonics diagrams

Several different methods, such as TIF, THFF or EDC, can be used to calculate harmonic currents and voltages in the network. In addition to the graphic output of frequency responses for specific nodes, PSS®SINCAL also displays network impedances at the complex level and harmonic levels for all nodes and network levels with the appropriate limit values.

Simulation of a resonance network is possible with very easy inputs. Current and voltage infeeders are allowed for odd-numbered harmonics anywhere in the network. PSS®SINCAL provides several different filters.

Functional characteristics of the harmonic calculations

- PSS®SINCAL provides three different methods for defining the dependency of the network elements on frequency. These consider the skin and proximity effects.
- Three-phase harmonic voltage and current distribution (unbalanced harmonic short circuit)
- Voltage and current harmonic distortion
- Determination of harmonic distortion factors. Several different methods such as, for example, TIF, THFF or EDC can be used to evaluate calculated harmonic currents and voltages in the network.
- In harmonics calculations, PSS®SINCAL also considers transformer vector groups to let you calculate how the 5th and 7th harmonics cancel one another, if you have a YY0 transformer and another one rotated 30 degrees, when you have two 6-pulse bridges.

Ripple Control

PSS®SINCAL Ripple Control calculations determine the ripple control level of infeeder currents of ripple control transmitters. You can select any ripple control frequency you want and PSS®SINCAL will convert all impedances to the ripple control frequency. The program treats inductive and capacitive parts of equipment impedances separately.

PSS®SINCAL stores the results of the ripple-control calculations in the network database. If you wish, the results can be displayed on the screen in the network diagram. PSS®SINCAL has data screen forms and tabular view for enhanced evaluations.

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