primtech – Clearance Calculation in Air Insulated Substations

The construction of Air Insulated Substations (AIS) entails special requirements for the maintenance of minimum distances between the different phases in live parts as well as between live and earthed/grounded parts. There are further requirements for the clearance between live parts and surrounding fences or vehicles driving through the substation.
All relevant clearances in high voltage substations can be calculated easily and quickly using primtech.

Intelligent 3D Substation Model

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In order to calculate clearances in a substation according to IEC 60071-2, there are two fundamental prerequisites that have to be fulfilled:
a) A 3D CAD-model of the substation
b) Information about each geometry - specifying if it is a live or earthed/grounded part, an insulator or a special object e.g. fence or street

Both requirements are completely fulfilled by primtech.
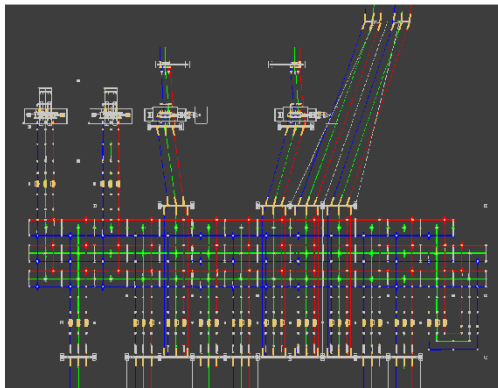

The Phase Checker

On the basis of the intelligent primtech 3D-models, the Phase Checker classifies all geometries into the following:
- live parts
- earth parts
- insulators
- fences
- streets

All live parts are then classified, through automatic phase tracking, into phase 1, 2 or 3. As a side note, you can also use the phase checker to see if all electrical conductors are correctly connected.
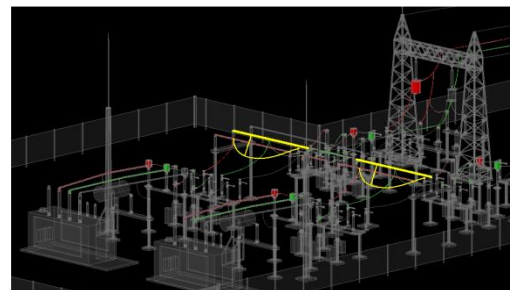
Clearance Calculation

All the required minimum distances throughout the whole substation can now be automatically determined based on the 3D model processed by the Phase Checker. The parts of the substation to be checked for sufficient clearance by be chosen individually and flexibly. primtech then visually highlight the areas which do not fulfill the minimum distance requirements to each other.
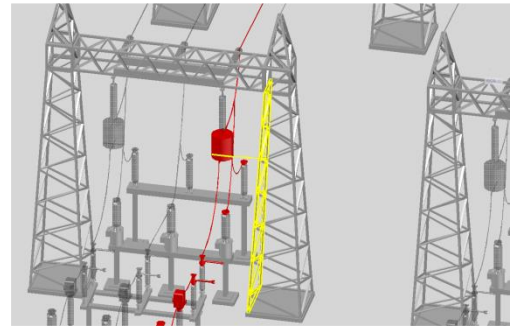
The following clearances can be calculates:
- Phase to Phase
- Phase to Earth
- Phases to Streets
- Phases to Fences
- Phases to Ground Level
- Insulators to Ground Level

Clash Detection

In addition to the clearance calculation, primtech can check the 3D model for collisions.

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