SIMULATIONS ARE HIGHLY RELIABLE

CASE STUDY 6: TANK TEMPERATURE RISE VERIFICATION

Through simulation, tank hot spot areas are predicted and located with high reliability. In fact the simulations show a very good match with the measured temperature values.

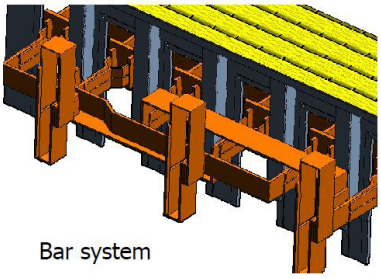
SUMMARY

The couples magnetic-thermal simulation of a rectifier transformer has been performed. The presence of a complex LV busbars system makes the localization of the hot spots not trivial.

The simulation provided a very good match with the measured tank temperature value an localization.

DESCRIPTION

50 MVA rectifier transformer.



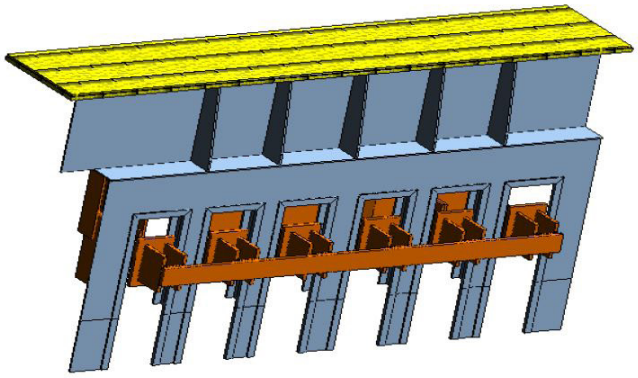
Bar system

TECHNICAL CHALLENGE

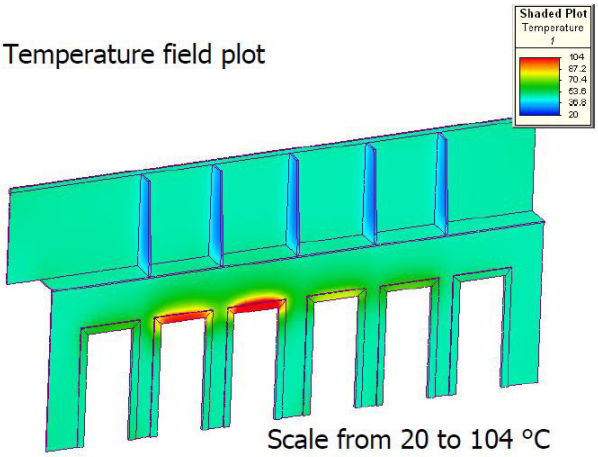
- Complex LV bars system.
- A coupled 3-dimensional magnetic-thermal simulation.
- Complex coil building and circuit.
- Mild steel tank wall and non magnetic steel parts had to be taken into account.

RESULTS

3D geometry

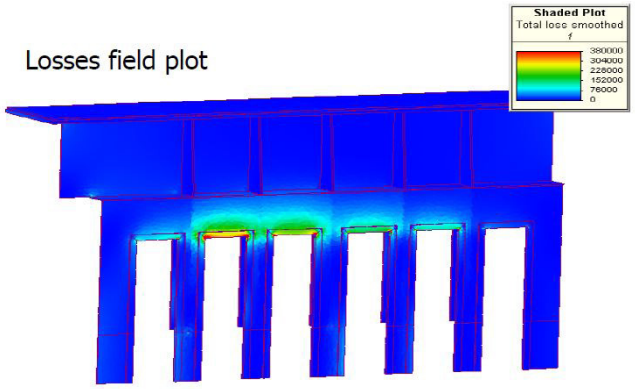


Temperature field plot

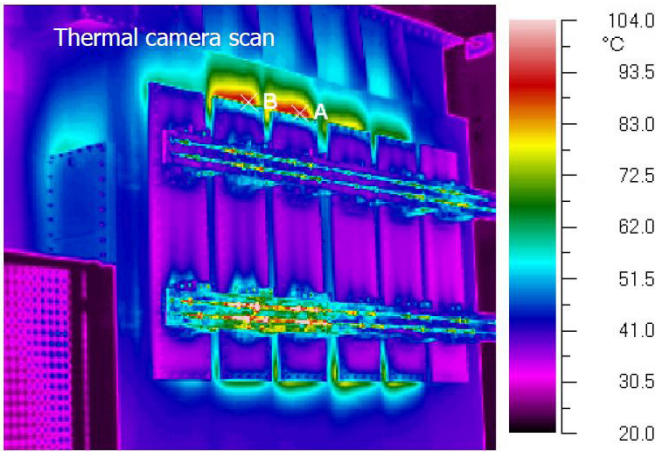


Scale from 20 to 104 °C

Losses field plot



Scale from 0 to 3.9×10^5 W/m^3



CONCLUSIONS

Good match between simulations and measurements. Simulations may be used to predict and prevent failures. In this way alternative solution can be studied at a design stage if the results of the simulations are not the ones expected.

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