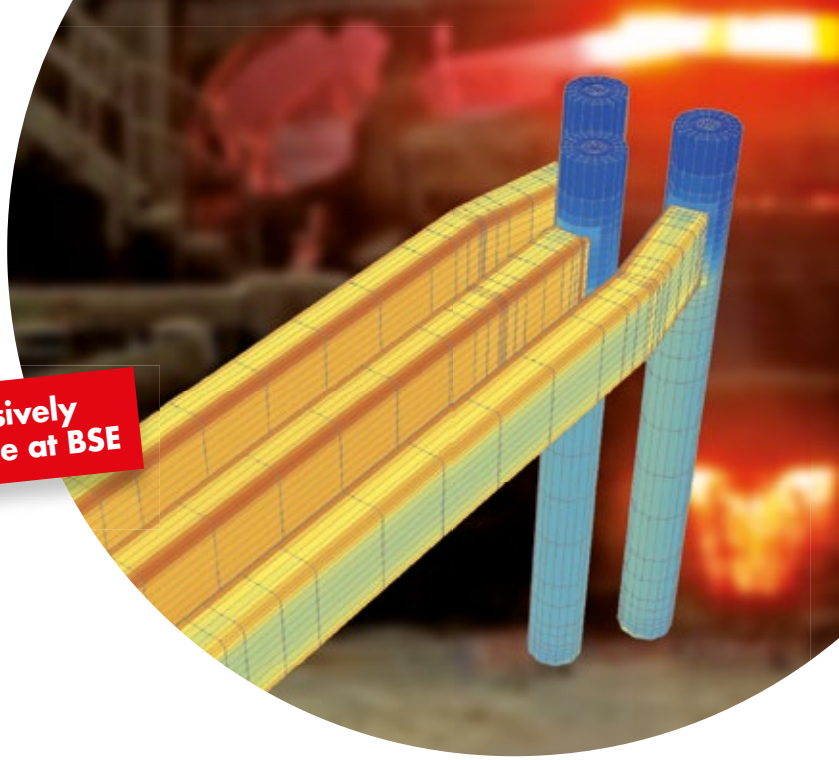
Finite Network Method



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Precise simulation of EAF high current systems

Principles.

- Detailed simulation of all electro-magnetic properties of EAF high current systems.
- Accurate simulation with a precision of less than 1%; all other methods have error ranges >10%.
- Simulation also for peripheral metallic structures where eddy currents are induced.
- Precise asymmetry calculation as the basis for good operational results.
- Optimisation of existing and optimum design of new high current systems.

Concept.

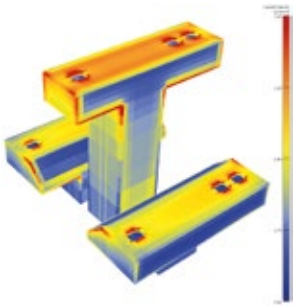
Finite Network Method (FNM) makes realistic simulation feasible for the first time:

- Local current densities.
- Exact short circuit impedance and asymmetry; short circuit tests (dip tests) are not necessary any more.
- Real static and dynamic forces and torques acting on the mechanical system.
- Local magnetic field strength and shielding effects.
- Induced eddy currents.

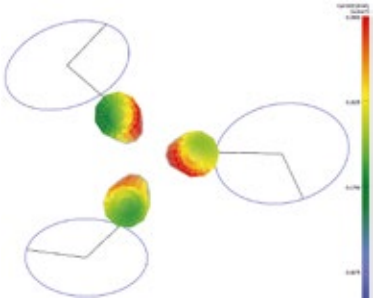
Advantages.

- Exact dimensioning of components and optimum symmetry.
- Optimum layout of masts and roller guides.
- Optimum design of high current conductors and symmetrising loops.
- Prevention of hot spots in the furnace.
- Balanced power input.
- Optimum material size and cooling.

Symmetrising loop on centre electrode arm for optimum symmetry of reactances



Induced eddy currents into electrode arm stools



Magnetic forces on electrodes

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