

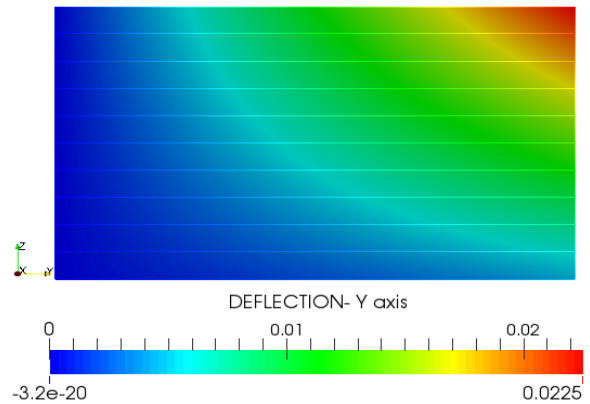
DESIGN OPTIMIZATION USING FEA FOR THERMAL POWER PLANT

Power Plant is an assembly of systems or subsystems to generate electricity. The power plant equipments are subjected to fluctuating thermal and mechanical loading during its operations. To ensure optimum performance with high reliability, it is mandatory to accommodate the varying load parameters at the design stage. TEFUGEN offers FEA solutions in the following areas of Thermal Power Plants apart from various other domains.

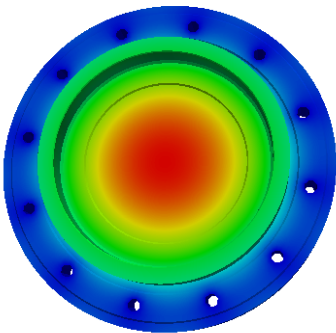
AIR-PreHeater Diaphragm Plate – Prediction of Thermal Deflection

The temperature gradient in the Air-PreHeater (APH) causes thermal deflection of the diaphragm plates. This deflection increases the clearance between the seals (attached to the diaphragm plate) and the sector plate. As a result of increased clearance, there is a heavy leakage from air to gas side due to differential pressure.

FEA is used to predict the diaphragm deflection caused by thermal gradient during its operation. Depending on the predicted deflection, accurate APH seals setting is done to minimize the APH leakage.



AIR-PreHeater Bearing Housing – Prediction of Stress & Deformation due to static loading



APH Bearing Housing is a major component which holds the whole weight of the APH. Bearing Housing is subjected to both axial and radial loads resulting from both weight of the APH & its operation. If the housing deflection exceeds 0.03 mm in the bearing outer race seating area, then it reduces the life of the bearing depending up on the deflection magnitude.

FEA is used to determine whether the stresses and deflection induced in the housing is within the limits prior to the designing and manufacturing of the housing. Such type of FEA simulations are extremely useful during renovation & modernization works carried out at power plants.

Pressure Vessel – Prediction of stresses and deflection

Pressure vessel is a container designed to hold gases at a higher pressure. Due to high operating pressure & temperature including the fluctuation of the same inside the vessel, fatigue crack can be initiated at the discontinuity where fatigue strength will be very weak. These regions are typically the location of highest stress in the component.

FEA is used for the evaluation of local failure & fatigue in the pressure vessel. Stress Classifications Lines are also typically located at the local structural discontinuity of vessel using FEA.

