Abstract:

Metal surface preparation is an important step in transformer tank manufacturing. It prepares the surface for the painting process and strengthens paint adhesion. This project aims to design a time efficient system for the conventional shot blasting machine that eliminates idle time lost during the loading and unloading stage of the process. The system uses a centrifugal wheel to propel abrasive on the transformer tanks surface. The tanks are transferred into the blasting chamber on a Dual-Platform trolley using a Wheel/rail system, it's then rotated inside the blasting chamber on a spinning platform that is fitted with a turntable bearing. The design is made using SolidWorks and analyzed for stress and displacement calculations using Finite Element Analysis (FEA). The FEA gave back acceptable results of stress and displacement under an extreme load of 5.4 tons. The design showed an efficient blasting process with a uniform abrasive distribution, reduction in process time and increase in production rate which offered a solution for the idle time during the shot blasting process of the transformer tank.