

- d) **Jehan H. Shazly and Amr A. Adly, “Extensions to the finite element technique for the magneto-thermal analysis of aged oil cooled-insulated power transformers”, Journal of Electromagnetic Analysis and Applications, 2012, 4, p (167-176).). & (presented in IEEE Electromagnetic conference 2010 (USA) as poster).**

It is well known that the hot spot temperature represents the most critical parameter identifying the power rating of a transformer. This paper investigates the effect of the degradation of core magnetic properties on temperature variation of aged oil-cooled transformers. Within this work, 2D accurate assessment of time average flux density distribution in an oil insulated-cooled 25 MVA transformer has been computed using finite-element analysis taking into account age-ing and stress-induced non-uniform core permeability values. Knowing the core material specific loss and winding de-tails, local core and winding losses are converted into heat. Based upon the ambient temperature outside the transformer tank and thermal heat transfer related factors, the detailed thermal modeling and analysis have then been carried out to determine temperature distribution everywhere. Analytical details and simulation results demonstrating effects of core magnetic properties degradation on hot spot temperatures of the transformer’s components are given in the paper.