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Loss of life of the mineral oil immersed transformers

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ABSTRAK

Transformers are one of the most important facilities in electrical power systems where their operations are the main role in providing reliability of the systems themselves. Because of the cost of transformers and their permanent connections to the transmission and distribution systems, any improvement is needed to extend the life span of the transformers. Insulation life of the transformer and loading capabilities depend on several parameters i.e. cooling mode, ambient temperature, oil viscosity and, etc. Hot spot temperature has played the most effective factor on the insulation life of the transformer. To predict the hot spot temperature and top oil temperature, many principal models have been proposed such as the classic thermal model, Annex G, and thermal-electrical models. This research attempts to determine an accurate hot spot temperature and then evaluate the loss of life of the transformer according to the numerical analysis method. Top oil temperature and hot spot temperature were determined by an accurate thermal model which takes into account the dynamic parameters such as ambient temperature, oil viscosity, winding losses, and loading profile.

Keyword: Mineral oil; Transformers; Electrical power systems