

Title: A case for the establishment of Malaysian standard for biodegradable insulation oil in Malaysia transformers

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Abstract: The dielectric properties of insulation oil in power transformers are dependent on the chemical structure of the oil. Although mineral oil based insulation oil is the common liquid dielectric used in power transformers, environmental and safety issues are pressurizing many stakeholders from developed countries to consider alternative fluid as transformer fluids. Vegetable (natural ester) based insulation oil is a viable alternative that has been commercialized in some countries. This paper presents results from the study done to ascertain the feasibility of using commercially available biodegradable insulation oil (Envirotemp® FR3™) for Malaysia power transformers. It was found that the tested oil failed to meet some of the standard insulating property values as stipulated in the Malaysian Standard (MS 2322:2010) and this was because the MS 2322:2010 is the standard for "Fluid for electrotechnical application-Unused mineral insulating oils for transformers and switchgear" which cannot be applied to Vegetable based insulation oil. This can lead to a misleading conclusion on the characteristics of natural ester oil as a substitute to mineral oil in power transformers. It is therefore pertinent to have a Malaysian standard property values for vegetable oil (natural esters) guiding researcher, manufacturer and users of "vegetable oil (natural ester) filled transformer in Malaysia"