

Paris Session 2022



Maintenance practices with ester liquids

SC A2 Power Transformers & Reactors

PS2, Q2.3 - What maintenance challenges exist for alternative technologies, especially for demanding applications? Is there any significant difference from the maintenance challenges for conventional oil-immersed transformers?

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Group Discussion Meeting

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Summary

- Maintenance practices of ester-immersed transformers are like that of oil-immersed transformers.
- Since natural esters are recommended for hermetically sealed equipment only, the usual reconditioning process for restoring some chemical characteristics may not be necessary for the entire transformer life.
- More frequent diagnostic schedules may be related to development projects and transformers still being in a field trial phase.

Maintenance practices with ester liquids

- Maintenance practices of ester-immersed transformers are like that of oil-immersed transformers.
- More frequent diagnostic schedules may be related to development projects and transformers still being in a field trial phase.
- Esters have higher permittivity and higher value of DDF. These, together with lower value of liquid resistivity and transformer resistance should be expected without jeopardizing the transformer reliability.
- Since natural esters are recommended for hermetically sealed equipment only, the usual reconditioning process for restoring some chemical characteristics may not be necessary for the entire transformer life.
- For best utilization of ester liquids performance, they may be combined with aramid insulation. This allows for higher temperature operation and may further reduce the footprint of the transformer by reducing its size. Use of aramid insulation eliminates water generation from degrading cellulose; hence, further eliminates need for liquid reconditioning.
- If treatment was needed, the regular oil treatment equipment can be used after complete rinsing with ester in order to remove residuals of mineral oil.



DGA interpretation

- Existing DGA interpretation criteria for natural esters are very rudimental and they need improvement.
- CIGRE JWG D1/A2.77 and IEC TC10 MT45 are working together for improving the guidelines.