

Paris Session 2022



Insulation system selection

SC A2 Power Transformers & Reactors

PS1, Q1.5 - Today liquid-filled and dry type transformers are used for GSUs in photovoltaic and wind parks and also for reactors. Which insulation system should be recommended under which circumstances?

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Summary

- Larger and larger transformers for renewable energy with higher and higher voltage levels promote liquid-filled insulation systems.
- Keeping in mind special installation sites and special operational conditions for GSU transformers, advanced insulation systems should be recommended, like robust insulation systems based on aramid insulation.
- If dry-type equipment is used, e.g. for inductive components, the high-performance insulation systems in thermal class 180 (H) may be used.

Aramid-based insulation for liquid-filled transformers

- Historically, offering maximum compactness.
- Weight saving of transformer and nacelle translates in cost saving on supporting structure.
- Allowing best use of tight space in containerized PV inverter installations or allowing maximizing the power output within the given size limits.
- Excellent overloading capability allows for design optimization for best fit to the expected loading patterns – especially important for repetitive loading pattern in PV installations (high peak loads accepted without compromising the transformer life).
- Ensuring long lifetime.
- **Advanced insulation systems developed for power transformers that cover all range of insulation components needed.**
- **First aramid-based insulation system has been recently certified by UL for liquid-filled transformer that proves the recognised performance.**

Group Discussion Meeting



Class H insulation for dry-type transformers

- Offering the best temperature handling for dry-type transformers,
- Insensitive to overheating in case of high current harmonics,
- Insensitive to malfunctioning cooling systems,
- Most compact inductive components allowing minimizing power converters for wind or PV applications,
- Fire safety proven in multiple industrial applications and in railways

