

Paris Session 2022



Effects of Operating Conditions on Partial Discharge Activity

A1

PS 2 Q2.3

Mladen Sasic (Canada)



Group Discussion Meeting

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1

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Comments on the Effect of Operating Conditions on Stator PD Activity

- Collected extensive experience from >5500 continuous on-line PD monitoring systems installed on stator windings
- Such analysis is easy if the PD data is tagged with the operational and environmental information from the plant computer
- Some observations:
 1. The natural variation of PD magnitude is +/- 25%, even with the same operating conditions – thus changes less than this may mean nothing
 2. Humidity can have a strong effect on stator endwinding PD
 3. Effect of load, stator winding temperature & humidity can help identify a dominant aging process. If 2 or more processes (which is common in older machines), no strong conclusions can be made
 4. With moderate or low PD magnitudes, MW, T and humidity have little effect
 5. We have never seen a causal relationship between bearing vibration and PD activity

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Questions for the Authors

- Are the authors sure the indicated pulse clusters are not due to discharging from a poorly bolted joint on the machine terminals (as in Q2.7 discussion)?
- Have they performed a visual inspection of the stator winding to determine/verify the actual cause of the PD?

Aging Process	Operating Condition Effect		
	Load	Temperature	Humidity
poor impregnation	None	neg.	none
degraded PD suppression coatings	little	pos.	neg.
loose coils in slots	pos.	little	neg.
endwinding separation	none	little	neg.
thermal	none	neg.	none
thermomechanical	none	neg	none
contamination	none	little	variable
metallic debris	none	none	neg.

