

1. Noise Separating Technique

As explained in the paper, this system has the ability to separate the PD signal coming from the inside of the generator from the signal coming from the power grid side, using two sensors.
 The electrical interference, such as partial discharge of the generator bushing and the core iron sparking, has not yet been clearly separated for online insulation diagnosis currently.

2. Possibility of Electrical Interference

In our experience, we recognize that bushing discharge is a rare event. As cases we have experienced, Table 1 shows the measurement result of partial discharge of a generator bushing, and Table 2 shows the specification of the bushing.
 It was caused by the ground layer in the epoxy tube floated away from the earth and grounding, causing an electrical discharge between the ground layer and the metal flange of the bushing.

Table 1 Partial discharge quantity of a generator bushing

Applied Voltage	Partial Discharge Quantity
9 kV	43000 pC

Table 2 Specification of a generator bushing

Item	
Rated voltage of generator	19kV
Frequency	60Hz
Type	Epoxy type
Hydrogen gas pressure	450 kPag

In this case, the magnitude of the electrical interference signal can be considered to be larger than that of the stator winding PD signal, even at the stepwise voltage value. Therefore, the PD value detected during operation is estimated to be several orders of magnitude higher, and the tendency is clearly different from the discharge value detected as the PD signal in winding, so it is possible to separate.

Large signals from such disturbance pulses will make it difficult to evaluate stator PD online. We would consider such disturbances as an anomalous condition, suggest improvements to users for this disturbance event, and recommend excluding them for online measurement evaluation.

In addition, "IEC60034-27-2", which is known as an important technical data on PD waveforms, reports the discharge pattern related to the occurrence of stator PD. We believe that most of the observed PD can be separated based on these PD waveforms. If a waveform different from these waveforms is observed, we think that a comprehensive evaluation including "offline diagnosis" and "operation logs (unique events such as overexcitation)" should be applied and resolved.

3. Conclusion

- The author is still in the process of examining how to separate the signals of electric interference from the PD signal from stator winding partial discharges, and experiments and measurements of signals will be conducted in the future.
- It is possible to separate the electrical interference, such as partial discharge of the generator bushing and the core iron sparking, because the magnitude of them is larger than the partial discharge signal of the stator winding PD signal.