Offline High Voltage Diagnostic Test Findings on 15MVA Generator of Basochhu Hydropower Plant

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Abstract : Even with availability of the modern day online insulation diagnostic technologies like partial discharge monitoring, the measurements like Dissipation Factor (tanδ), DC High Voltage Insulation Currents, Polarization Index (PI) and Insulation Resistance Measurements are still widely used as a diagnostic tools to assess the condition of stator insulation in hydro power plants. To evaluate the condition of stator winding insulation in one of the generators that have been operated since 1999, diagnostic tests were performed on the stator bars of 15 MVA generators of Basochhu Hydropower Plant. This paper presents diagnostic study done on the data gathered from the measurements which were performed in 2015 and 2016 as part of regular maintenance as since its commissioning no proper aging data were maintained. Measurement results of Dissipation Factor, DC High Potential tests and Polarization Index are discussed with regard to their effectiveness in assessing the ageing condition of the stator insulation. After a brief review of the theoretical background, the strengths of each diagnostic method in detecting symptoms of insulation deterioration are identified. The interesting results observed from Basochhu Hydropower Plant is taken into consideration to conclude that Polarization Index and DC High Voltage Insulation current measurements are best suited for the detection of humidity and contamination problems and Dissipation Factor measurement is a robust indicator of long-term ageing caused by oxidative degradation.

Keywords : dissipation Factor (tanδ), polarization Index (PI), DC High Voltage Insulation Current, insulation resistance (IR), Tan Delta Tip-Up, dielectric absorption ratio
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