Research on new technology of online ice melting in distribution network

Abstract-The icing of overhead lines can cause problems such as falling towers, disconnections, and vibration, which will cause large-scale power outages. Existing ice melting methods at home and abroad are currently mainly based on AC short-circuit ice melting technology and DC short-circuit ice melting technology.During the ice melting period, power outages are still required, and there is no engineering precedent for online ice melting. At present, distribution network mainly uses artificial bamboo poles to de-icing in which there is a great personal safety hazard.

The speech first introduces the principle of the new online ice melting technology. The grounding transformer and the adjustable reactor are combined into a zero-sequence reactor. The grounding transformer is used to provide the neutral point and the adjustable reactance is used to adjust the melting current value. In the case of non-stop line, by adjusting the inductance value of the adjustable reactor connected to the neutral point of the ice-coated line, the end of the line is used as a zero-sequence circuit, and the zero-sequence current component is superimposed to make the coating. The ice melting current of the ice section line exceeds its specified minimum melting current to achieve the ice melting effect, and the voltage and current on the load side will not be affected during the ice melting operation, thereby realizing online ice melting. A grounding transformer with a capacity of 2500kVA and a seven-turn adjustable reactor with adjustable impedance are manufactured. The designed grounding transformer, adjustable reactor, and related equipment such as the switch required for ice melting are carried out on the pilot line for the network ice melting test. The results of the observation and analysis of the voltage, current and other data during the ice melting process show that the device has the function of melting ice without power failure..