

UGM Students Develop Arrester for Very Fast Lightning

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Four students of Electrical Engineering and Information Technology (DTETI), who are Muhammad Faiz Zifa, Rizal Bagja Wiguna, Wahyu Apriliyanto, and Wisnu Pamungkas, have researched the performance of arrester when it is struck by a lightning very swiftly. Arrester is a tool in electric energy system used to protect electric currents from lightning strike.

Under the guidance of Prof. T. Haryono, high voltage engineering lecturer, the four students did the research using arrester of ZnO type that is tested with lightning generator in the High Voltage Engineering Laboratory at DTETI.

The idea stemmed from the fact that Indonesia is a country with the highest lightning intensity in the world. "The most dominant disruption in the Indonesian electric energy system is caused by lightning strikes. They can damage equipments, leading to extensive blackout," said Faiz, chairman of Student Creativity Programme on Wednesday (8/6).

Faiz explained the velocity of lightning strike is unpredictable, allowing very fast strikes. The ZnO arrester is used as a protection system against the strike in the channel and has the role as the main protective device.

"The compay that produces the ZnO arrester only tested the tool on the determined value of lightning strike, without considering the arrester performance when struck by a very fast lightning.

So, a research is needed on the arrester performance when the electric energy system is struck by the lightning," added Faiz.

The research showed that when hit by the strike, the arrester will work by cutting the voltage value of the lightning strike when the tolerance limit voltage value has been passed and then flows the over-voltage to the ground. The faster the lightning strike wave, the higher value of cut voltage due to the performance of the ZnO arrester. The value of this cut voltage flows in the channel, so during high voltage value, the voltage will be more damaging to the electric energy system, and so, may lead to a blackout.

The research outcomes are expected to benefit people in terms of arrester component development so that it can withstand varied velocities of lightning strikes. This is especially so for medium voltage air channel that uses 20kV arresters in Java, Madura, and Bali. Hopefully, there will be less blackout happening due to lightning strikes.

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