

What does the power outage on 9 August 2019 tell us about GB power system

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Abstract

The power outage on 9th August 2019 affected over 1 million customers in England and Wales and caused a major disruption to other critical infrastructures. While the power system responded exactly how it was designed to in response to an unsecured (N-2) event, it has uncovered important fault lines which may significantly affect reliability of the system in a near future.

Over the last 10 years or so the GB power system has changed quite rapidly due to the decarbonisation drive and penetration of smart grids technologies. Hence it is increasingly difficult for the ESO to fully monitor, model and control the whole system and therefore the probability of hidden common modes of failures has increased. This would suggest that it might be prudent to strengthen the old (N-1) security standard by providing extra security margin.

There were also other issues highlighted by the outage. Embedded generation reached such a high penetration level that it cannot be treated any longer as negative demand. Traditional under-frequency load shedding disconnects indiscriminately all customers on the disconnected feeders, including embedded generation and frequency response units, hence reducing its effectiveness. The ability of critical infrastructures and services to ride through the disturbances has to be closely monitored and tested.

Finally, we have concluded that, in GB at least, power outages matter only if they affect critical infrastructures, especially transport, in London and the surrounding areas.

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