PSERC Power Systems Engineering Research Center

PSERC WEBINAR

Resilience risk metrics calculated from utility data that address the huge variations in blackout cost

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Extreme weather events are gradually increasing in frequency and size, and this continues to pose a risk of damage to electric power systems.
By looking at outage data recorded by utilities, it turns out that extreme events are not outliers, and they follow the patterns of heavy tail statistics, in which extreme events are rarer than moderate events, but are nevertheless high risk.
I will show some heavy tailed distributions of event customer cost observed in utility data and explain their consequences.
In particular, there are huge variations in blackout cost in observed distribution utility data that make it impractical to estimate the mean large blackout cost and the corresponding risk in the usual way.
To solve this problem, I will propose resilience metrics that describe large blackout risk using the frequency of large-cost blackouts and the mean of the logarithm of the cost of large-cost blackouts.

AUGUST 27, 2025 | **1:00-2:00 P.M. ET**
LINK TO WEBINAR (10:00-11:00 A.M. PT)

Ian Dobson was educated at Cambridge University, England and Cornell University USA. He is now Sandbulte professor of electrical engineering at Iowa State University and an IEEE Life Fellow. He has worked on blackout mechanisms for many years and is currently interested in finding new ways to model and quantify resilience from utility data.