

Determinants of Resilience in Power Systems – A Look at Situational Awareness

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Abstract

Critical Infrastructure (CI) plays an essential role in people's daily lives. According to the Department of Homeland Security, critical infrastructure can be defined as the "backbone of our nation's economy, security and health". In the real world, critical infrastructure supports people's basic lives by undergirding provision of basic necessities. Modern life is highly reliant on the critical infrastructure systems and associated products. However, people may all have gone through the frustrating experiences of critical infrastructure failures. Failures include events such as, blackouts, water disruption, and network disconnection. The reliability of the power grid is constantly threatened due to ineffective communication between organizations and inadequate situation awareness as a result of blackouts and aging infrastructure systems. There is a need for improvements that enhance the reliability of the power system. Although the current literature identifies situation awareness as a primary determinant of power systems resilience, there is a need for research that augments the technical focus of current approaches. This research aims to identify root causes of degraded situation awareness in the electric power grid and present corresponding solutions. Our findings are valuable for engineering managers who seek to find the factors that result in insufficient situation awareness and improve the reliability of electric power grid.

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