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WAPA continues to take a proactive response to emerging challenges in the energy frontier. In the case of geomagnetic disturbances, caused by solar activity, we have been working with the Electric Power Research Institute's Sunburst program.

Geomagnetically induced currents can cause physical damage to transformers and protection systems as well as stress the transmission system's ability to compensate for abnormal, widespread voltage dips. GICs are not detectable with today's standard monitoring equipment, creating an additional challenge.

The Upper Great Plains is particularly vulnerable to GMD due to its northern latitude. The region has partnered with EPRI to collect GMD-related data that helps scientists model and forecast GICs and develop ways to protect the grid.

UGP conceived, designed and implemented an in-house GIC-monitoring solution at two substations to detect rapidly changing GICs flowing through power transformers. These readings give dispatchers instant awareness of voltage dips and other threats to transmission system equipment so they can take immediate action to prevent equipment from overheating, preserve operating service margins and continue to ensure reliable service to customers.

UGP used as many existing communication and control assets as possible to minimize costs. *The in-house solution will avoid about \$300,000 in costs over the next 10 years.* As the WAPA network of monitoring equipment grows, so will the cost savings.

The system also assists UGP with complying with North American Electric Reliability Corporation standards and annual NERC GMD Section 1600 data requests.

Based on the success of the initial deployment, WAPA intends to widen the network to other WAPA regions.

To learn more about this initiative and UGP's GIC-monitoring system, contact Chris Colson at Colson@wapa.gov.

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