



PEAKRELIABILITY
assuring the wide area view

**WESTERN INTERCONNECTION
SYNCHROPHASOR PROGRAM
PROJECT UPDATE**

WESTERN INTERCONNECTION SYNCHROPHASOR PROGRAM

**California Independent System Operator,
Arizona Public Service
& San Diego Gas and Electric**

**Use Synchrophasor Data to Accelerate Reclosing of an
Important Tie Line**

March 3, 2014

On October 18, 2013, the Imperial Valley – North Gila 500kV line tripped and locked out. As significant standing angle separation with this line open has been an issue in the past, standard operating procedures included confirmation of the relative phase angles of the two 500kV buses and an option to increase generation output in the Imperial Valley area to reduce the angle difference between them. These measures were historically aimed at achieving a successful reclose without risking equipment damage. On this day, however, the California ISO operator was reluctant to increase the generation in Imperial Valley because the Imperial Valley transformers were already significantly loaded and an increase in the generation would have exacerbated that loading.

Instead, the CAISO used the synchronized phase angle difference between the ends of this important tie line that were newly available in the control room from Arizona Public Service's phasor measurement unit (PMU) at North Gila and San Diego Gas and Electric's PMU at Imperial Valley. These synchronized measurements were transmitted in near real time to the CAISO over the dedicated and secure Wide Area Network deployed as part of the Western Interconnection Synchrophasor Program (WISP). They indicated a 37.2 degree separation, well within the 50 degree limit for successful reclosing. The operators reclosed the line successfully without requiring a change in the Imperial Valley generation output and without a delay. This simple use of the WISP infrastructure resulted in a more rapid restoration of a critical tie line between southern Arizona and southern California than would otherwise have been possible and without unnecessary redispatch of generation. The time period with the line out of service was limited, thereby reducing the power system's vulnerability to a potential subsequent contingency.

About SGIG

The U.S. Department of Energy awarded over \$328 million to support the installation of 1,400 PMUs across the United States under the American Recovery and Reinvestment Act's Smart Grid Investment Grant (SGIG) initiative. SGIG funds were awarded to accelerate the modernization of the nation's electric transmission and distribution systems and promote investments in smart grid technologies, tools, and techniques that increase flexibility, functionality, interoperability, cybersecurity, situational awareness, and operational efficiency.

About WISP

WECC received \$53.9 million in funding from U.S. Department of Energy's Assistance Agreement DE-OE0000364. The funding, awarded under the American Recovery and Reinvestment Act's Smart Grid Investment Grant initiative, matches dollars committed

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by nine WISP Cost Share Participants to extend and deploy synchrophasor technologies within their western electrical systems. The total funding for WISP is \$107.8 million.

About Peak Reliability

Peak Reliability (Peak) monitors and directs the reliable operation of the bulk electric system within the Western Interconnection. Peak works with Balancing Authorities, Transmission Owners and Transmission Operators to ensure an uninterrupted flow of electricity to consumers. Headquartered in Vancouver, Wash., Peak operates two Reliability Coordination Offices—located in Loveland, Colorado and Vancouver, Washington—that provide situational awareness and real-time supervision within the Western Interconnection.

About CAISO

The CAISO is a nonprofit public benefit corporation charged with operating the majority of California's high-voltage wholesale power grid. Balancing the demand for electricity with an equal supply of megawatts, the CAISO is the impartial link between power plants and the utilities that serve more than 30 million consumers. The CAISO provides equal access to the grid for all qualified users and strategically plans for the transmission needs of this vital infrastructure.

About APS

Arizona Public Service Company is the largest electric utility in Arizona, and the principal subsidiary of publicly traded S&P 500 member Pinnacle West Capital Corporation. With 4,000 MW of generating capacity, and as a major transmission provider, APS serves more than one million customers in 11 counties throughout most of the state, mainly concentrated in northern and central Arizona.

About SDG&E

SDG&E is the regulated public utility that provides energy service to 3.3 million customers through 840,000 natural gas meters and 1.4 million electric meters in San Diego and southern Orange counties in the United States. It is owned by Sempra Energy, a Fortune 500 energy services holding company that is based in San Diego. The utility's area spans 4,100 square miles (10,600 square kilometers) and employs about 5,000 people. SDG&E's long-term energy resource plan relies on a balanced mix of resources to meet the growing energy needs of San Diego. That mix includes increased emphasis on energy efficiency, more renewable energy resources, and additional baseload generation plants and transmission capacity.

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