

Lesson Learned

Loss of Station Observability

Primary Interest Groups

Balancing Authorities (BAs)
Generator Operators (GOPs)
Reliability Coordinators (RCs)
Transmission Operators (TOPs)
Transmission Owners (TOs)

Problem Statement

There have been multiple incidents in which loss of observability and control for substations has occurred during system disturbances. These losses significantly hinder system restoration efforts and the system operator's ability to analyze system conditions and may result in incorrect operator decisions.

Details

The following caused the loss of station observability in different events.

- Ground potential rise during a disturbance caused damage to Supervisory Control and Data Acquisition (SCADA) and communications equipment;
- A remote terminal unit (RTU) was powered by an ac circuit that lost power during a disturbance and no backup power supply was available;
- Loss of power supply to a third-party communications system.

Corrective Actions

The damaged SCADA and communications equipment was repaired or replaced and a design change was made to reduce the probability of a similar occurrence in the future.

Lesson Learned

The ability of RTUs, transducers, and related communications systems to withstand ground potential rise often present during a fault can be compromised when dc supply circuits to these systems are not adequately isolated from ground. Electrical isolation of these components from ground must be preserved to maintain system operator visibility and control of transmission system elements during disturbances. Loads connected to the station battery should be tested regularly for grounds. If grounds are detected on station battery circuits, immediate action should be taken to locate and eliminate them.

Reliable power supplies to RTUs, transducers, and related communication systems also are critical to maintain system operator visibility and control of transmission system elements. System disturbances may interrupt power to this equipment when it is supplied from ac sources. Entities should consider powering their RTUs, transducers, and related communications systems from the station battery rather

than from ac sources. It also is strongly suggested that entities provide this equipment with backup power supplies—especially for equipment associated with Critical Facilities.

In addition, loss of power supplying third-party communications systems can adversely impact system operator visibility and control of transmission system elements. Entities that utilize third-party communication systems should work with their vendors to ensure that equipment designs include backup power supply options and have a surge capability adequate for a substation environment.

NERC's goal in publishing lessons learned is to provide industry with technical and understandable information that assists them with maintaining the reliability of the bulk power system. NERC requests that you provide input on this lesson learned by taking the short survey provided in the link below.

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