Ameren Illinois Smart Grid Overview

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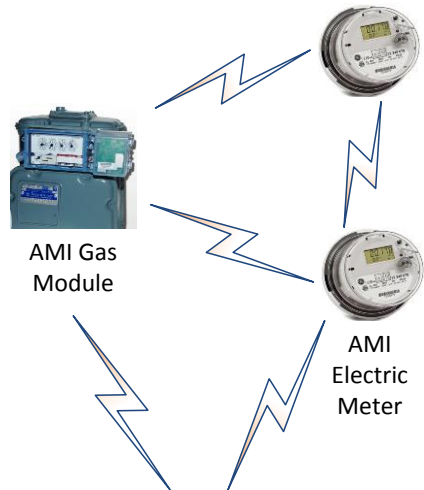### Vice President & Chief Information Officer

Ameren Services

Smart Grid Overview

- Advanced Metering Infrastructure (AMI)
- Technology Applications Center (TAC)
- Cybersecurity

AMI Networking Diagram

AMI Gas Modules send consumption data once per day and wake up hourly to receive/ respond to requests. The modules are battery powered

AMI Gas Module

AMI Electric Meters are network elements (i.e. support communications from other electric meters and gas modules to a repeater or router). They also contain a radio in support of the home area network

AMI Electric Meter

Back Office Systems: AMI Head End, Meter Data Management System, Customer Service System, Data Warehouse, etc.

Multiple Security layers to protect utility operations and ensure customer data privacy

Firewall, Security Appliances & Protected Zones

FAN Router collects, stores, and transmits up to five days of meter usage data plus alarms, flags, events to the network backhaul

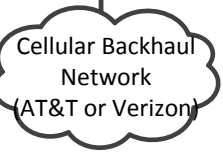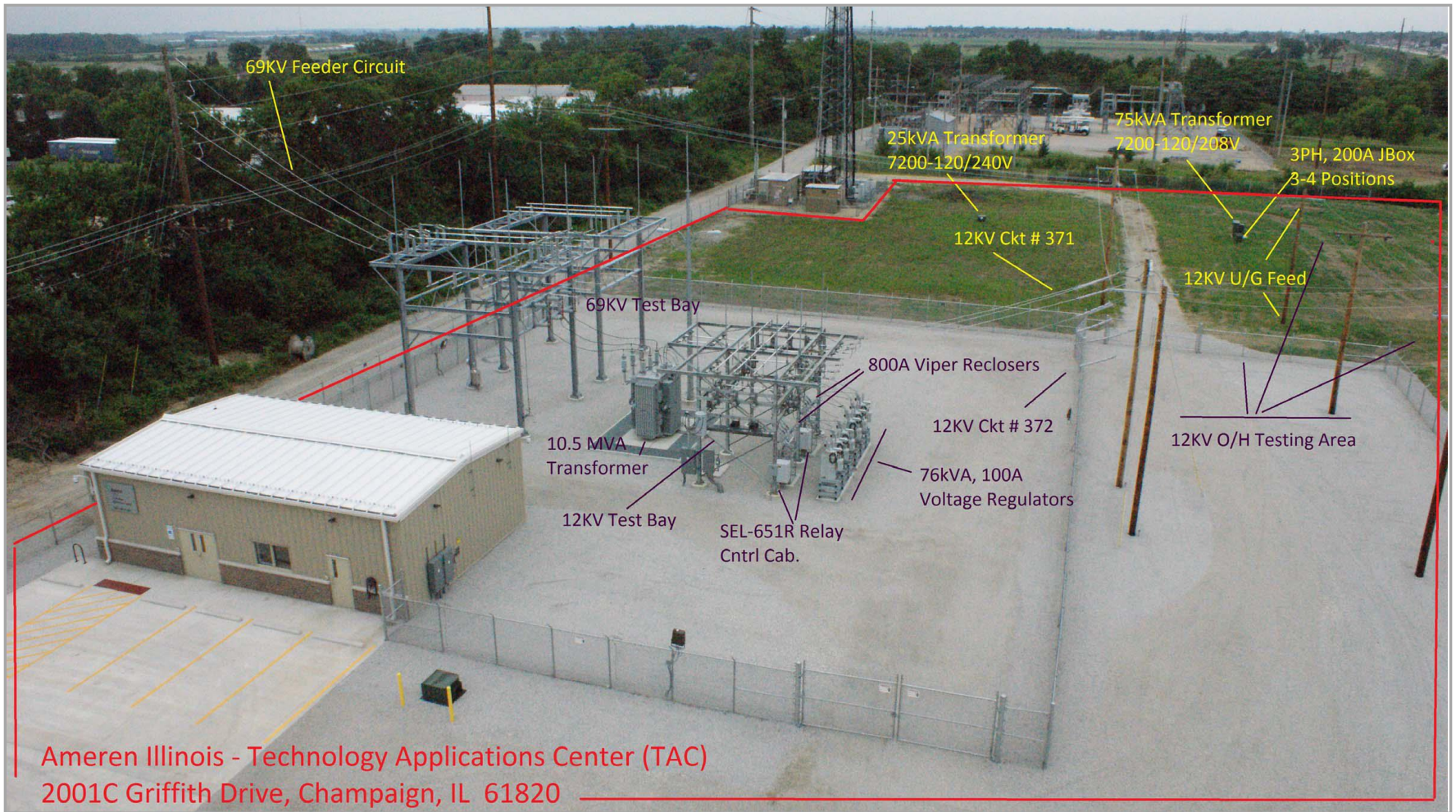FAN Repeater(s) transmit meter data plus alarms, flags, and events to a router

Field Area Network Repeater

Field Area Network Repeater

Field Area Network Router

Cellular Backhaul Network (AT&T or Verizon)

Wide Area Network

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Cybersecurity

- Cybersecurity is a key component to ensuring the technology and associated business processes are secure, customer data is protected and threat detection identification and mitigation processes are in place.

- Features of associated cybersecurity architecture and processes will include:
  - The NIST Security Framework is the foundation for our cybersecurity model
  - Data encryption technologies similar to those used by US Dept. of Defense and financial institutions
  - Strict cyber and physical access controls
  - Electronic segregation of environments
  - 24/7 monitoring of associated networks and devices
  - Execution of third-party penetration tests with some frequency
  - Strict adherence to Ameren's Data and Information Classification and Encryption Policies
  - Cybersecurity education and training of employees and contractors

- Cybersecurity personnel have been dedicated full-time to this effort and are participants in various national and regional security efforts, such as the Smart Grid Interoperability Panel and DOE Voluntary Code of Conduct.

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