



Ameren Illinois

3rd Quarter 2013 Smart Grid

Test Bed Report

November 14, 2013

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Executive Summary

Ameren Illinois Company (Ameren Illinois) submits the following Smart Grid Test Bed Quarterly Report in accordance with the Energy Infrastructure Modernization Act, (EIMA) 220 ILCS 5/16-108.5 et seq. (“the Act”). This report provides updates on the steps Ameren Illinois has taken to implement its test bed plan during the third quarter of 2013. The report includes information on activities Ameren Illinois has undertaken to design and construct its “primary” test bed location, discussions with potential test bed customers, and on the testing application process.

Test Bed Cost and Construction Status

Status

The completion status for the “primary” Technology Applications Center (TAC) location is as follows:

Engineering Design = 100%
Site Survey = 100%

Site Construction = 100%
Equipment Purchases = 100%

Actual Costs

Provided below are the actual costs incurred through September 30, 2013, for the primary test bed location:

Work Order	Description	Cost
J00BM	Design and construction of substation and control building	\$2,811,399
J00LR	Design and construction of distribution feeders on “primary” TAC site	\$221,494
J022S- J0242	Acquisition of testing infrastructure tools	\$285,370
J00QT	Network Communications	\$137,800
J023B	69KV Line Extension to TAC site	\$79,558
	Total Actual Costs for 2012-2013	\$3,535,621

Estimated - Timeline/Schedule – Primary TAC location

- Site Prep & Foundations: Start - 10/10/12 Finish – 01/15/2013
- U/G Infrastructure: Start - 01/15/2013 Finish – 08/30/2013
- Overhead Infrastructure: Start - 03/01/2013 Finish – 08/30/2013
- Control Building: Start – 01/15/2013 Finish – 06/17/2013

Notes:

1. In-service date of “primary” TAC location June 17, 2013. Substation was energized on this date. Official opening of Technology Applications Center was held August 21, 2013 and was attended by approximately 80 individuals.
2. In-service date of “secondary” TAC location was November 15, 2012.
3. Final Distribution system modifications related to the primary TAC location were completed September 5, 2013 between Ameren Illinois and the University of Illinois Urbana – Champaign. Completion of this work now allows the TAC distribution circuit to be fully operational for Smart Grid testing applications.

Test Bed Interest

External

- Ameren Illinois received a TAC application from a Cyber-Security development company. This application proposes to pilot this company’s situational awareness product against threats to the distribution and automation networks. Ameren Illinois is reviewing the application and plans to meet with the vendor in early November to further refine the project’s scope of work.
- Ameren Illinois has determined that the major utility equipment provider, which was listed initially in the 4th Quarter 2012 report to the Energy Foundry, will not be utilizing the services of the Technology Applications Center at the present time. The final vendor proposal included a requirement for Ameren Illinois to purchase the equipment included in the testing proposal, which is not an acceptable term to Ameren Illinois.
- Ameren Illinois received notice from Schweitzer Engineering Laboratories, Inc. (SEL) that it has been selected and awarded a Funding Opportunity Announcement (FOA) No. DE-FOA-0000797 under the U.S. Department of Energy (DOE). The project scope is entitled “Software Defined Networking Project” (SDN) and will include an alliance between Ameren Illinois, University of Illinois Urbana-Champaign (UIUC), Pacific Northwest National Laboratories (PNNL), and SEL. The purpose of the SDN Project is

to develop a Flow Controller that monitors, configures, and maintains the safe, reliable network flows of all the local area networks (LANs) on a control system in the Energy sector. Ameren's participation in the project is to help steer the commercialized technology so that it addresses industry requirements. The TAC may be used for testing and demonstration of the developed flow controller.

- Ameren Illinois also received notice from the Electric Power Research Institute (EPRI) that it has been selected and awarded a Funding Opportunity Announcement under the same FOA grant per Topic Area 4 to assist in Secure Remote Access for the energy sector, titled: "Secure Policy-Based Configuration Framework (PBCONF)". This project aims to correct the diversity gap through flexible configuration framework that securely configures the devices and provides the homogeneous view needed for global security. Ameren will be supporting the Electric Power Research Institute (EPRI), UIUC and SEL in researching and demonstration of this application.
- Ameren Illinois conducted several tours of the TAC during the 3rd Quarter of 2013 as follows:
 - University of Illinois – Research Engineer, 1 attendee
 - University of Illinois – Research Professors, 3 attendees
 - Illinois State University – Teacher Workshop for leaders, 30 attendees
 - Illinois Green Economy Network – Community College Deans, Faculty and staff members, 10 attendees.
 - ARPA-E – Department of Energy Researchers, 3 attendees
 - TAC Grand Opening, approximately 80 attendees
 - Exponent – Infrastructure testing company, 1 attendee
 - University of Illinois – Research Professors, 4 attendees
- As a result the publicity generated from the Technology Applications Center Grand Opening, several industry contacts were developed. Although none of these contacts have officially submitted applications to the TAC testing processes, numerous conversations took place during the 3rd Quarter of 2013 and are continuing.

Internal

- Ameren Illinois has begun testing a new voltage regulator control that incorporates wireless communications. The project involves installing new Voltage Regulator Controls on the regulators connected to one of the TAC circuits. This technology allows Ameren Illinois to remotely collect data via a secure Wi-Fi network to analyze power flow without the installation of costly current and power transformers (CTs & PTs) along with

communication conductors. The initial prototype is operational and undergoing testing with the Remote Terminal Unit (RTU) for reliability and accuracy. Ameren Illinois' interest in this technology is to improve collection of distribution system load flows and improve power quality through an economical installation methodology.

- Ameren Illinois conducted several tours of the TAC during the 3rd Quarter of 2013 as follows:
 - Ameren Illinois Leadership, 2 attendees
 - Ameren Illinois Relay Engineering Department, 8 attendees
 - Ameren Illinois Relay Maintenance technicians, 15 attendees
 - Ameren Cyber Security group, 3 attendees

Smart Grid Test Bed Plan Success

Ameren Illinois' commitment to the successful implementation of its Smart Grid Test Bed plan is strong. However, as set forth above, Ameren Illinois reserves the right to modify, amend or alter this plan, as necessary and consistent with the law, to meet the requirements and objectives of the EIMA and other related provisions. Additionally, Ameren Illinois reserves its right to terminate this plan.