ICC Docket No. 07-0566
Commonwealth Edison Company's Response to
People of the State of Illinois' (AG)
Data Requests AG (MLB) 6.01 – 6.33
Dated: January 11, 2008

REQUEST NO. AG (MLB) 6.08:

Reference: Supplemental Direct Testimony of Mr. Donnelly; ComEd Exhibit 15.0; lines 115-117 (Initial Steps Under SMP)

According to Mr. Donnelly, "For ComEd, the initial steps toward a Smart Grid would mean the replacement or supplementation of single-purpose, typically analog, and often stand-alone operating, measurement, communication, and customer service devices…with interoperable, digital, and integrated devices." Please describe in detail, for each of the following existing facilities presently in use by ComEd, what vintage and type of technology is now deployed and the approximate amounts of total capital investment in same:

a) Time of use metering.

b) Meter reading automation

c) Demand response and load control programs

d) Mobile dispatch and work management systems

e) Field communications systems

f) Outage management systems

g) Automatic switching and reclosers

h) Automated line reconfiguration

i) Automated line isolation relays

j) SCADA

k) Dispatch training simulation.

RESPONSE:

ComEd objects to this data request to the extent that it seeks a complete description of the vintage and type of every unit of equipment or facility ComEd has deployed in these areas. Such a request would be unreasonably burdensome and not reasonably calculated to lead to admissible evidence. Subject to this Objection and its General Objections, below is a general description of

the type of vintage of equipment installed. Data concerning "capital investment" relating to historical assets is not maintained by the categories identified in this data request.

a) Time of use metering.

ComEd uses the Itron P+4 hand held device with an optical probe to read recording and time of use meters on a monthly cycle, (i.e. each meter read once per month). The data from the hand held devices is uploaded to the billing system at the end of the day. The Itron System is used to read 68,000 time of use meters each month. Over the years we have upgraded both the software application and used several versions of handheld computers.

b) Meter reading automation

ComEd uses the Itron MV90 system to read 2600 meters with phone modems and the Smart Synch TMS system to read 3600 meters with the Skytell two way paging technology. The MV90 system was installed in 1995 and the TMS system was installed in 2002.

c) Demand response and load control programs

The existing facilities for the residential Nature First Program includes direct load control switches manufactured by either Comverge or Cannon Technologies. Currently there are about 65,000 of these switches installed in the ComEd service area. These switches began being installed for the Nature First Program in 1996 and continue to be installed today. Detailed information about these two types of switches is attached in AG (MLB) 6.08_Attach 1 and AG (MLB) 6.08_Attach 2.

The existing demand response and load control facilities for ComEd's commercial and industrial customers is provided by the KeyAlert load control notification system. Currently 163 KeyAlert devices are installed at customer sites. More details about the KeyAlert devices can be found in AG (MLB) 6.08_Attach 3.

d) Mobile dispatch and work management systems

ComEd understands this question to refer to the Mobile Dispatch project at issue in this case, and not to include the mobile data systems more generally. The Mobile Dispatch system is not yet installed for use in a production environment.

ComEd's Work Management System is Ventyx PassPort R10.

e) Field communications systems

Given the geographic, urban and rural nature of the ComEd service territory, ComEd supports multiple technologies to meet the business requirements including, analog Microwave, Sonet over fiber (private and leased), leased Carrier Circuits. Much of the hardware is at end of life and no longer supported by the manufacturer. With regard to the fiber infrastructure, ComEd has approximately 850 miles of fiber within its territory that forms a ring topology. There are two

networks running through the fiber backbone, one consists of a Sonet ring provisioned as either OC3 or OC12 rings on Lucent DDM-2000's and carries the SCADA telemetry data. The second network is a Nortel JungleMux (JMUX) provisioned primarily as OC3 on an isolated network supporting protective relay system. The microwave system is predominantly a Harris analog system requiring a refresh to digital microwave to provide additional capacity. The current microwave system is used in conjunction with the JMUX fiber infrastructure primarily for protection relay and operates at 6 GHz with a maximum channel capacity of 9600 baud. There are approximately 100 protection relay lines, 83 sites and 200 microwave radios.

For voice communications there is a 900 MHz Motorola Trunked radio system (SmartZone Analog Trunking System) which is 13 years old covering approximately 55,000 square miles of service territory. This infrastructure consists of 27 sites; 30 receivers and 108 repeaters. There are approximately 800 portable radios and 2000 dash mounted or mobile radios. The backhaul utilizes the above mention fiber & microwave infrastructure.

f) Outage management systems

The ComEd Outage Management System runs on a dual server, multi-node Hewlett Packard Itanium configuration with a San system running ORACLE RAC 10G, Version 10.2.0.2. The OMS software is the ABB Network Manager - Distribution Management System, Release 2004.2.6. This software was modified to run on the Itanium platform, ported over from Hewlett Packard's Tru-64 environment.

g) Automatic switching and reclosers
ComEd presently has approximately 400 15 kV NOVA reclosers on the distribution system. ComEd uses the 15 kV NOVA recloser and Form 6 controller from Cooper Power Systems. Each installation includes full SCADA functionality using theUtiliNet 900 MHz radio network

h) Automated line reconfiguration
ComEd presently has approximately 900 Automatic Line Reconfiguration Switches (ALRS) on the 34 kV sub-transmission system. ComEd uses the SCADAMate switch from S&C. Recent additions to the ALRS strategy are automated Vista switchgear from S&C operating with IntelliTeam 2 technology. In additional to talking with one-another, all of these switches also have full SCADA functionality using the UtiliNet 900 MHz radio network.

i) Automated line isolation relays

ComEd understands this category to refer to substation microprocessor relaying. Since the mid 1990's, ComEd, has utilized microprocessor relaying as a standard on distribution feeder applications. These are predominately Schweitzer Engineering Lab (known as SEL) products. Models include SEL221, SEL251, SEL351, SEL311, and SEL501 protective relays. A single microprocessor relay installed on a feeder can provide all functions now performed by legacy electromechanical overcurrent/reclosing relay scheme. In addition, features such as breaker failure, fault target & location, breaker/trip circuit health, power system metering, under frequency protection, and oscillography with storage are also utilized. At the substation, the relays are integrated into SCADA through a Communications' processor.

The vast majority of electromechanical relaying consisted of ABB (Westinghouse) products. Models include the 'CO', 'KD', and 'IRD' model protective relays. These were the standard prior to the 1990's transition a microprocessor platform.

j) SCADA

The ComEd SCADA System utilizes multiple technologies, based on the technology and requirements at the installation period. Equipment includes Remote Terminal Units (RTU), Transducers, Programmable Logic Controllers (PLC), Digital meters, Microprocessor relays, Revenue meters, Communication Processors, and Personal Computers (PC) for telemetry gathering and remote control. These technologies have been applied to substations (TSS, TDC, SS, DC, & limited ESS's) over a 30-year period. At each substation installation, the RTU or Communication Processor continuously collects and reports equipment status and metering value to the Master SCADA Server from transducers, relays, meters, etc. Communication between the substation and Master SCADA Server will utilize multiple communication paths, such as analog phone circuits, high speed data circuits, muxed fiber circuits, licensed radio, and analog microwave. Through the SCADA Server, substation control, equipment status and metering quantities are presented to the Transmission and Distribution Dispatch areas. Additionally, all SCADA data is continuously archived in the SCADA Historian. The Historian allows Engineering, Planning, and Maintenance areas to playback substation information for analysis. SCADA equipment from the late 1970s to 1995 time frame consisted of RTUs and transducers. From 1995 to 2001, Microprocessor relays, PLC's, small RTUs, Station PCs, and Communication Processors were installed. From 2001 to present, Microprocessor relays, Communication Processors, small RTUs and Distributed I/O modules.

The equipment types include:
RTU's from Leeds & Northrup and Valmet (currently METSO).
Transducers from Scientific Columbus, Transdata, and Bitronics
PLC's from Modicon (Compact and 984 PLCs)
Digital meters from Bitronics
Revenue Meters from Schlumberger
Communication Processors from Schweitzer Engineering Lab (2020 and 2030 models)
Microprocessor relaying from Schweitzer Engineering Lab

System: ABB Ranger
Vendor: ABB
Age: 6 years
Technical Details:
HP hardware with TRU-64, Windows 2000 servers, and Windows XP for consoles
PI database on Windows 2000 on IBM hardware
Database: Oracle 9i on HP
# of screens per operator console: 4

k) Dispatch training simulation.

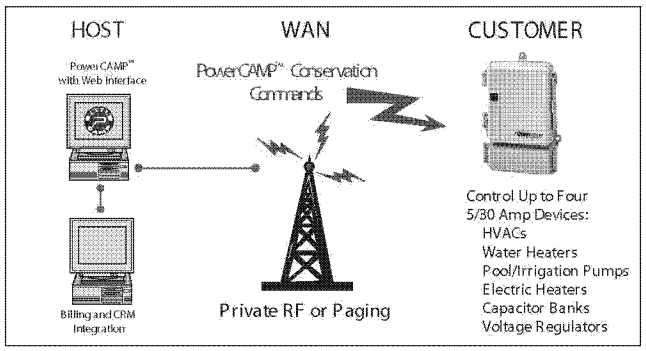
ComEd currently does not have a dedicated dispatch training simulation system in use.

SuperSwitch™ DCU

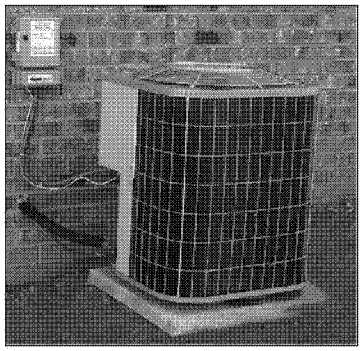
Frequency Agile
Direct Load Control

AG (MLB) 6.08_Attach 1

SuperSwitch DCU



Communication Architecture



SuperSwitch DCU Installed

DESCRIPTION

The SuperSwitch™ Digital Control Unit (DCU) is Comverge's frequency agile, multiple address, load management receiver, programmable by radio, that incorporates distributed intelligence and individual addressability. The SuperSwitch DCU features field-proven technology developed through a twenty-five year development history. Significantly reducing the cost per control point, it is used for one-way direct load control for up to four independently-operated, co-located 5 amp or 30 amp load bearing appliances. It can be programmed over-the-air with PowerCAMP™ and/or locally via its IR port and Comverge's portable Palm FieldAgent™.

APPLICATIONS

o Switches or Cycles Remote Electrical Loads in Response to Commands from a Central Host

FEATURES

o Up to Four Million Unique Addresses
o Up to 500,000,000 Dynamic Address Groups
o Over-the-Air Programmability
o Distributed Intelligence for Smooth Ramping
o Up to Four Controllable Loads per Unit
o Outputs Available in 5 amp or 30 amp Relays and/or Relay Driver

SPECIFICATIONS

Electrical

o 240 VAC +/- 15%
o 40 dB Receiver Image Rejection
o 15 µV/m Receiver Sensitivity
o VHF 139 to 173 MHz Available
o Min. 30 dB Adjacent Channel Rejection
o Receiver Freq. Stability: 20 PPM over temp. range
o Power Consumption: 5 W max

Mechanical

o 8.5" H x 6.6" W x 2.5" D
o 2.8 lbs.

Environmental

o -40 to 149 Degrees F (-40 to 65 Degrees C)
o 0 to 100% Humidity (non-condensing)
o Rain-tight Enclosure

NETWORK PROTOCOLS

o POCSAG 512 and 1024 Auto Switch
o SA205 and SA206
o SA305 Expansion

CERTIFICATION

o FCC Part 15

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