Substation Automation and Enterprise Data Management to Support Smart Grid

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Intelligent Electronic Device (IED)

• Any device incorporating one or more processors with the capability to receive or send data/control from or to an external source (e.g., electronic multifunction meters, digital relays, controllers)
# Substation Integration and Automation Levels

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<td>IED Integration</td>
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<td>Intelligent Electronic Device (IED) Implementation</td>
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<td>Power System Equipment (Transformers, Breakers)</td>
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Integration

• Integration of protection, control and data acquisition functions into a minimal number of platforms to reduce capital and operating costs, reduce panel and control room space, and eliminate redundant equipment and databases.
Automation

• Deployment of substation and feeder operating functions and applications ranging from SCADA and alarm processing to integrated volt/Var control in order to optimize the management of capital assets and enhance operation and maintenance (O&M) efficiencies with minimal human intervention.
Communication Paths From Substation

• Two second data to SCADA system (operative data – extracted using industry standard protocol such as DNP3)
• On demand data to utility information server or data warehouse (non-opeartional data – extracted using IED vendor’s proprietary ASCII commands)
• Remote access from remote site to isolate a particular IED (also called “pass through” or “loop through”)
Operational and Non-Operational Data Paths

Diagram showing the connections between various devices and networks, including:
- Workstation
- Server
- Data
- Firewall
- Router
- Engineering PC
- Data Warehouse
- Radio tower
- Corp WAN
- Substation Value Proposition
- Enterprise Value Proposition
ELSSI Communications Vision
Data Mart Vision

The **Virtual Data Mart** Links Users and Applications to Data from Multiple Sources of Record