The following customer cases highlight the project scope and benefits brought by implementing GE Utilities Communications offering for critical utility services.
**Democratic Republic of Congo**
Optical telecom network linking two control centers and two AC/DC conversion substations

**Italy**
PLC solution for voice, data, and teleprotection services with enhanced management topology

**Brazil**
Optical Transport Network for business operations and mission-critical services for P&C

**India**
Strengthening existing network with integrated voice, data and protection system

**Kingdom of Saudi Arabia**
System design, manufacture, testing, delivery, site testing & commissioning
DEMOCRATIC REPUBLIC OF CONGO

PROJECT SCOPE

Installation and commissioning of:
- Plesiochronous Digital Hierarchy (PDH), Synchronous Digital Hierarchy (SDH), Teleprotection (TP) and Private Automatic Branch Exchange (PABX) network with 30 telecom panels
- 29 telecom towers
- 7 solar shelters along 1500km of High Voltage Direct Current (HVDC) line
- High Frequency radio network for voice & data communications between two control centers situated 1500km apart
- CCTV system in remote shelter sites

BENEFITS

- Improved management of the electrical grid network
- Remote control of substations from both control centers, with greater protection of electrical lines
- Enhanced communications between operational teams
- Improvement of exchanges with Zambia and communications between Distribution Control Systems (DCS) located in HVDC and High Voltage Alternate Current (HVAC) substations
**PROJECT SCOPE**

- Integration of Gridcom T390 High Voltage Power Line Carrier (HV PLC) with existing Remote Authentication Dial-In User Service (RADIUS)
- User authentication and rights authorization
- A Secure Shell (SSH) channel for communications between HV PLC hardware and remote users
- Increased hardware data processing capacity for RADIUS and SSH, while keeping original service performance

**BENEFITS**

- RADIUS authentication ensures confidential communication for remote users
- Secure SSH channel guarantees data integrity
- Adapts to customer-defined centralized telecom user management system
- Improvement to existing HV PLC software and hardware platform by introducing enhanced cyber security management features
BRAZIL

PROJECT SCOPE

- Delivery of Dense Wavelength Division Multiplexing (DWDM), Optical Transport Network (OTN) and Synchronous Digital Hierarchy (SDH) devices
- Project documentation and drawings
- Integration of all devices and their systems
- Proof of concept and factory & site acceptance testing of OTN/DWDM, SDH and Network Management (NMS) Systems
- Local installation and supervision of OTN/DWDM, SDH and NMS system in Northwest region of Brazil
- Customer training on the new OTN/DWDM technology
- Trial operation with functional and systemic testing in a real environment
- 3-year system assurance

BENEFITS

- Accelerating telecommunications services by operating on fiber optics at a 10 gigabyte per second laser speed
- Optimization of network management in real-time, aligning operations and ensuring a continuous of energy at all times
PROJECT SCOPE

- Design, engineering, FAT, supply, testing, commissioning, SAT and warranty
- Uni directional short haul Plesiochronous Digital Hierarchy (PDH) type 8 Mbps capacity OLTE equipment with primary multiplexer (mux) and Main Distribution Frame (MDF)
- Two directional Managed Synchronous Digital Hierarchy (SDH) type Long Haul, driving up to 180Km in both directions, Synchronous Transport Module-4 (STM) upgradable to STM-16 OLTE with Primary Mux
- Eight directional Managed SDH type Long Haul, driving up to 150Km in both directions, STM-4 upgradable to STM-16 OLTE with Primary Mux
- 57 Directional Protection Couplers and over 26Km of 24F and 48F Approach Cable

BENEFITS

- Stable and reliable communication scheme for new Power Substations Efficient management of substation load monitoring
- Enhanced grid stability through speech, data and protection services
KINGDOM OF SAUDI ARABIA

PROJECT SCOPE

- Communications for Substations and 3 Control Centers
- GE Optical Fiber Transmission and Multiplexing
- Ultra-Long Haul Repeaterless Optical Communications
- GE Teleprotection Signaling
- GE Substation Controllers/RTUs
- Communication device from 3rd party suppliers

BENEFITS

- First fossil-fuel fired power plant to incorporate solar energy production to boost efficiency - known as an integrated solar combined cycle (ISCC) plant
- Power generated from project will contribute in growth and development of this developing region which currently has limited grid connectivity
- With integration of solar power and the introduction of condensate fuel, this project contributes towards Saudi Arabia’s Government’s vision to promote energy sector efficiency with a focus on renewables
For more information on GE’s Utilities Communications portfolio, And the benefits our solutions bring, please visit ge.com/digital/customers/digital-energy