Peraton

SCADA NETWORK MODERNIZATION AND IMPLEMENTATION SERVICES

Preparing Utility Networks for the Future—the Practical Way

THE CHALLENGE

The Supervisory Control and Data Acquisition (SCADA) system is a critical component of a utility's operation. It directly supports the generation and delivery of power, gas, water, and other utility services. Most utilities are currently faced with a significant challenge to modernize their 30-year-old SCADA networks.
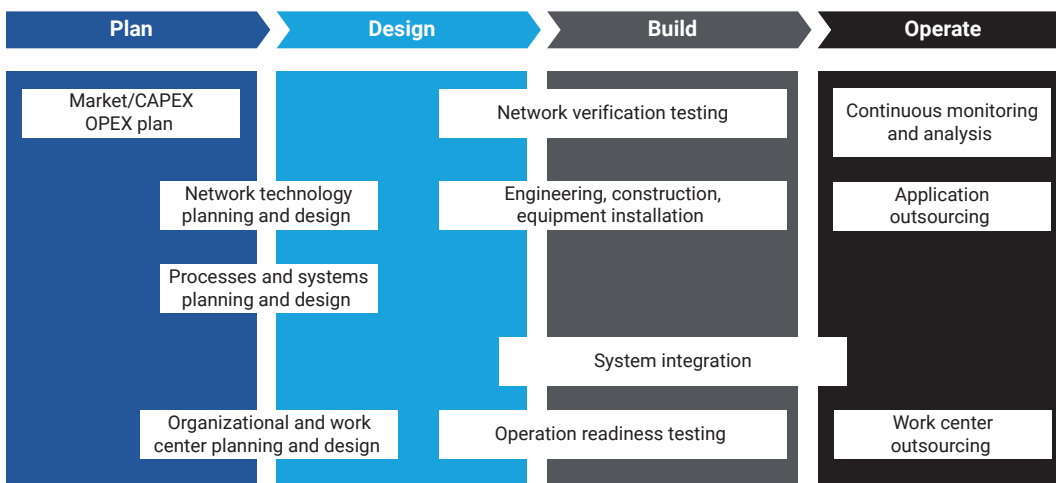
Technologies such as synchronous optical networking (SONET), Frame Relay, and private line wire services have reached end-of-life. Providers are phasing out these obsolete technologies and the associated services are becoming increasingly expensive to maintain.

Many existing SCADA networks are not able to meet evolving business needs and cybersecurity requirements. Legacy SCADA networks often cannot support the demanding communications needs of utility distributed generation and smart grid initiatives. Utility networks have become a highly attractive target for cybercrime. In response to accelerating threats, utility networks also need to achieve a higher standard of cyber resilience to ensure service and meet new and enhanced cybersecurity requirements.

Determining the best roles for available and emerging technologies, such as Multiprotocol Label Switching (MPLS), carrier ethernet, software defined networks, cloud, and others, in an evolving network can be daunting. It's an operational and financial decision a utility may have to live with for the next 20 years. More robust and secure network architectures are called for, requiring further network segmentation and redundancy. Data-centric approaches are recommended to support advanced analytics and precision diagnostics.

THE SOLUTION

Peraton Labs combines smart grid operations and cybersecurity expertise with a proven past of network planning and design success to meet this critical need. We assist utilities in developing practical plans, architectures, and designs to modernize critical SCADA network infrastructure. Our services are specifically focused to help a utility support smart grid applications and provide the foundation for systems monitoring and control for the next few decades. Comprehensive yet flexible, the services address complete network overhauls as well as incremental upgrades and targeted new technology insertion to meet a specific need. Whether the project is still in its inception or midstream, our approach can help ensure success.

Plan	Design	Build	Operate
Market/CAPEX OPEX plan		Network verification testing	Continuous monitoring and analysis
	Network technology planning and design	Engineering, construction, equipment installation	Application outsourcing
	Processes and systems planning and design		
		System integration	
	Organizational and work center planning and design	Operation readiness testing	Work center outsourcing

Our experience has shown that focused investment during up-front planning can help avoid costly mistakes during implementation. It can help a utility decide whether to rip-and-replace or migrate and transform its network and legacy technologies to avoid mismatched implementations over time. It also assists utilities to balance budgets and capital cost against functionality and operational costs.

THE APPROACH

Our services are based on a proprietary and disciplined, four-phased methodology to plan, design, build, and operate (PDBO). Each phase adds detail and specificity to the requirements, strategies, and plans specific to each stage of the project lifecycle. PDBO is a proven methodology for dynamic, complex communications infrastructures for enterprises, government agencies, utilities and telecom operators.

Plan

- Long and short-term needs; smart grid vision
- Stakeholder requirements
- Current communications and IT infrastructure:
- Interface number/type
- Packet-based networks compatibility
- Substation services
- Operations center communications
- Mission critical services backup paths
- Systems reaching end-of-life
- Manual vs. automated operation requirements
- SCADA network traffic characterization and traffic model
- Services, volumes, frequencies, latencies, redundancies, hotspots and availability levels
- Tributary service traffic streams; e.g., critical infrastructure protection SCADA, telemetry, video surveillance, peer-to-peer protection
- Situational awareness
- Day-to-day operations
- Baselines
- Security policy and monitoring

Design

- Locations and quantities of SCADA assets
- Network architecture, cloud services
- Economic and technical analyses
- Traffic engineering
- Survivability and availability
- Topology, bandwidth allocation, and service level agreements

- Cybersecurity architecture overlay
- Integrated network and operations plan
- Insourcing and outsourcing plans
- Organizational domain knowledge
- Division of operational responsibilities
- Private wireless systems vs. existing Advanced Metering Infrastructure plan
- Solution analysis
- Replacement strategies
- Standardization vs. vendor proprietary plans
- Supply chain risk mitigation

Build

- Actionable roadmap
- Staged rollout and budget plans
- Standards alignment
- Trials and procurement
- Installation, testing acceptance
- Continuous monitoring
- Operations support systems
- Interoperability
- Provider service level agreements

Operate

- On-going operations and systems support
- Continuous performance and cybersecurity monitoring
- Maintenance procedures
- Operations processes
- Organizational coordination
- Network operations center and security operations center modification
- Visibility indicator refinement
- Metrics and reporting
- Governance and change management

For more information on PDBO and our SCADA network modernization and implementation services, see Network migration and modernization - Peraton Labs or contact info@peratonlabs.com.

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