



# Grid Modernization

Design-Build System Integration for a Digital Grid

# The Digital Age is here; presenting new perspectives and solutions to how we operate and serve. It's making things faster, more efficient and simply better.

With its promises of reliable service, efficient performance and increased security and resilience, a Digital Grid is essential to the dynamic power and information flow needed for a flexible, scalable utility. To achieve full digitization, utilities need to first modernize their infrastructure. Black & Veatch's Grid Modernization design-build approach and system-wide technology expertise is a single, seamless solution for building the Digital Grid.

Black & Veatch provides the People, Processes and Tools to help utilities ready their networks, substations, and distribution assets for a future of efficiency, reliability and resiliency. Together, this system-wide vantage point allows us to see the interrelationships and connections between operations, technology and the network, ensuring we address all operational and stakeholder requirements.

## People

From the operations to the control center to the digital grid devices installed in the field, Black & Veatch provides end-to-end planning, implementation and integration for all technology and network applications. Our utility automation professionals work side-by-side with our network engineers, ensuring each technology solution is aptly supported by an advanced communications network.

Communications	Automation	IT
<ul style="list-style-type: none"> <li>• LTE/5G/PLTE</li> <li>• WiMAX</li> <li>• Microwave</li> <li>• Land Mobile Radio</li> <li>• Fiber / OSP Networks</li> <li>• Wide Area Networks</li> <li>• Field Area Networks</li> </ul>	<ul style="list-style-type: none"> <li>• Substation Integration Automation</li> <li>• Distribution Automation</li> <li>• SCADA Systems</li> <li>• Feeder Automation/FLISR</li> <li>• Integrated Volt/VAR Control and Optimization</li> <li>• Distribution System Sensor Integration</li> <li>• Renewable Integration</li> <li>• Demand Response Control</li> </ul>	<ul style="list-style-type: none"> <li>• IP/MPLS/SONET</li> <li>• DWDM/CWDM</li> <li>• Network Management</li> <li>• Network Operation Centers</li> <li>• Data Centers</li> <li>• Cybersecurity</li> </ul>

## Process

With a single partner to manage, deploy and integrate your grid modernization projects, utilities are assured a seamless and efficient system implementation. By taking an Engineering, Procurement and Construction (EPC) approach, Black & Veatch is able to provide a collaborative and flexible solution resulting in accelerated schedules and cost savings.

## Program Management

Black & Veatch applies proven program management and ISO-certified quality management processes gained from our traditional energy projects, and uses best practices from our many distributed, multi-site communication deployments to provide insightful oversight of grid modernization programs.

- Scope, schedule and budget oversight and management
- Design and management of execution plan
- Safety and quality assurance

## Consulting Engineering Services

Modern innovation gives way to numerous scenarios and solutions for optimizing the grid. Our consulting engineers help utilities select the best path towards the greatest regulatory, operational and consumer benefits. This includes the hardware, software and services, processes and people required to achieve operational excellence.

- Vision, conceptual design and architecture
- Technology assessment and solution selection
- Power system studies, planning and design

## Engineering Services

Black & Veatch designs automation schemes and communication network solutions to integrate grid technology. This dramatically improves monitoring and control capabilities at the control center and increases reliability and efficiency of the distribution system.

- Detailed network design and architecture
- Installation design
- Make-ready engineering
- Field engineering

## Procurement and Construction Services

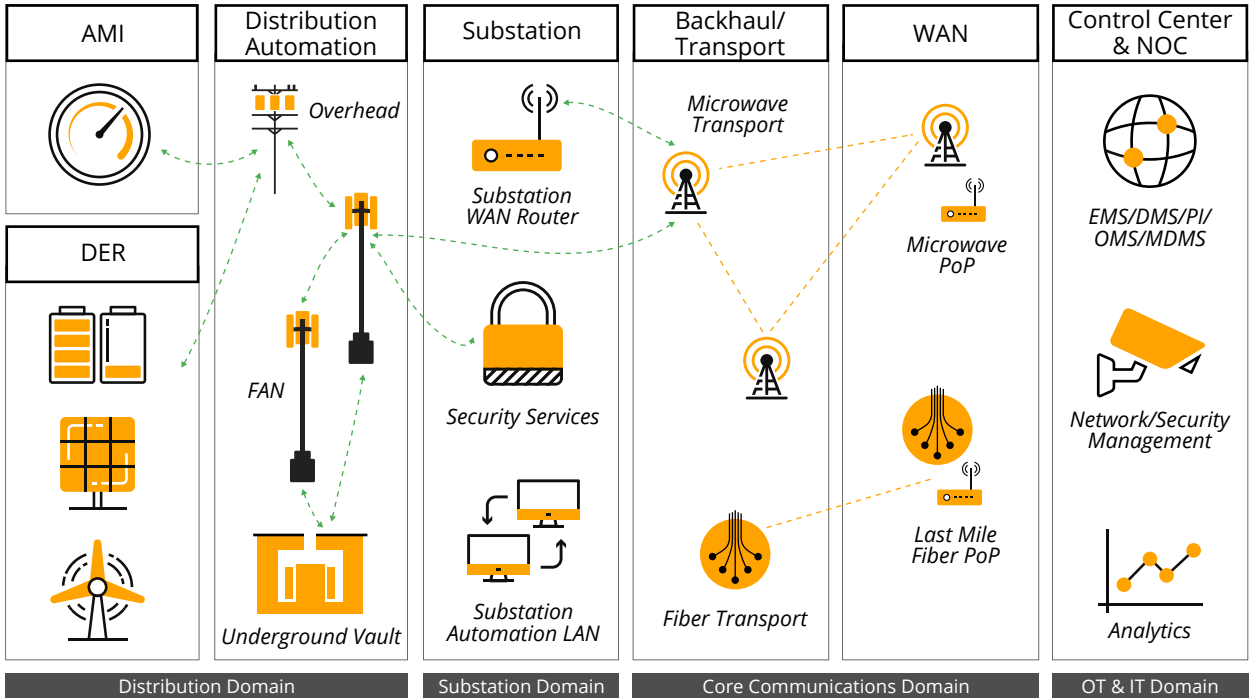
Black & Veatch is a leader in power delivery system construction and management. Through hands-on experience on thousands of projects, we've refined our materials management and have become proficient in installation and testing of technology.

- Vendor selection and management
- Equipment and material logistics and tracking
- Construction management
- Installation testing and commissioning

## Tools

By harnessing the power of geospatial technology and data integration, Black & Veatch's powerful program management and execution tool suite provides a single, centralized location to view a project's design and performance at any time — past, present, and even future. It improves planning and forecasting through enhanced dimensional design and mapping, and drives schedule efficiency, intelligent decisions, and quicker issue resolution through data integration and analytics. The tool suite captures, integrates, and analyzes data and defined key performance indicators, such as field data, drawings, schedule, budget, resources, and quality metrics, and combines them with massive-scale project management and controls. This creates a holistic view of a project's performance to guide day-to-day tasks, decision-making, and real-time scenario planning. We've integrated GIS spatial engineering with an enhanced knowledge base and data analytics to create a truly unique tool. We find it makes project teams faster, more efficient, and, ultimately, smarter.

## Smart Distribution System: Active Network



Black & Veatch's solutions begin with a system wide-view of a Smart Distribution System. By delivering a wide breadth of services among a deep list of technologies, Black & Veatch provides a highly-efficient project execution. Our expertise covers communications, smart applications, technology and data analytics across the grid.