



# Asset Lifecycle Risk Management (ALRM)

Unified Asset Investment Planning, Performance Management and Enterprise Risk Solutions

Driven by increased regulatory scrutiny of risk exposures, utilities have a heightened need to address grid and other infrastructure reliability, resiliency, modernization and security needs via an integrated asset lifecycle risk program meeting organizational and industry best practice standards. An effective asset risk program is anchored on data quality, asset condition assessments, and optimized investment strategies that are repeatable, justifiable and auditable. Several incidents in the recent past highlight the necessity for

more rigorous planning and investment for reliable grid and integration of distributed energy resources with existing infrastructure. Investment decisions must be made in consideration of risk-reduction value per dollar invested under a comprehensive Enterprise Risk Management (ERM) value framework that provides consistency and continuous optimization across the enterprise.

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**BLACK & VEATCH**  
MANAGEMENT CONSULTING

# The Black & Veatch Value

Black & Veatch Management Consulting, LLC (Black & Veatch) utilizes an enterprise risk management framework that guides customers in consistently quantifying risk and optimizing risk mitigation investments across the enterprise. We use best practice tools and methods in evaluating asset reliability risk and resiliency, energy portfolio decarbonization, grid modernization requirements and investment optimization. Our areas of expertise include:

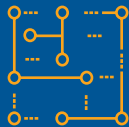
- Climate risk exposure strategies including investment weatherization
- Enterprise Risk Management strategies and metrics
- Data requirements and data quality assessments
- Procurement and adoption of APM and AIP technologies
- Asset Risk Mitigation Analytics
- Design and optimization of asset risk mitigation strategies
- ISO 55001 and ISO 31000 assessments
- OT Cybersecurity management strategies under NIST CSF and other frameworks

Black & Veatch's Asset Lifecycle Risk Management consultants bring a track record of designing and delivering creative solutions for utility asset investment and enterprise risk management needs. We understand asset risk mitigation techniques and the utility business in the context of its full enterprise risks. Our team leaders have 30+ years of experience in energy infrastructure, asset investment planning, asset performance management and enterprise risk management. Our core team benefits from an organization anchored in energy infrastructure and operations, including power, oil & gas, renewable energy, environment and emerging technologies expertise.

## Our Asset Lifecycle Risk Management...



Effectively integrates best practice asset-tailored risk analysis with leading enterprise and system-wide investment optimization technology.



Utilizes a novel and highly granular "Matrix" approach to grid investment planning and analysis by consistently evaluating and scoring investment returns. Our approach goes beyond prioritization to optimization of investment \$, targeting and sequencing to achieve reliability, resiliency and grid modernization objectives.



Packages and presents the analysis to support effective scenario assessment and constrained optimization decision-making across a wide variety of budget, program constraints and mix of required vs. optional program investments. This ensures selection of the best risk-adjusted return on Plan investment.

## Services

**Asset Investment Planning.** Procuring, configuring and adopting an AIP solution that enhances current practices and enables the optimization of investment portfolios can be a daunting process. Black & Veatch's utility and AIP expertise is backed by robust asset analytics and investment value modeling tools. We help our clients realize their business and asset integrity effectively and transparently, "reaching across the aisles" with a consistent methodology that brings competing utility objectives together.

Our risk value framework and methodology enables utilities to create a repeatable, justifiable and auditable process for quantifying risk mitigation value and optimizing capital investments. Our methodology allows competing investments to be compared on a common scale and optimized across the enterprise. This level methodology provides the granular picture of what work on which lines, mains, substations, circuits, etc. mitigates the most risk and provides the highest value to your customers.

Our services include:

- AIP Software Procurement Support

- Business Integration
- Asset Risk Integration into AIP
- Benefit Analysis
- Regulatory Support

**Asset Performance Management.** We combine in-depth knowledge of electric and gas T&D assets, asset risk analysis and utility business expertise in guiding our clients through an effective APM procurement and implementation process. Industry expertise can vary widely across transmission and distribution asset classes, making our knowledge and best practice methodologies vital in assisting utilities to navigate across multiple asset classes efficiently, consistently and productively. Solutions are tailored to each utility's needs and include:

- ISO 55001 Assessments
- APM Procurement Support
- AI Data Inclusion
- Business Integration
- Remaining Life Asset Risk Analysis
- Asset Analytics
- Change Management

**Data Quality Analysis.** Data quality is imperative for AIP and APM analysis and results reliance, a key ingredient in the adoption of new tools and information. Enterprise-wide projects that rely on data

usually fall short due to data cleansing effort taking too long and often failing to meet objectives. Black & Veatch understands what data is necessary and important for high-quality results in AIP and APM systems and processes. Our targeted approach provides customers with an understanding of the state of their data and leverages remedial action methodologies to expedite data quality and use initiatives. Services are tailored to each utility's needs and include:

- Data Source Requirements
- Data Mapping
- Data Quality Assessments
- Data Cleansing Efforts
- Data Collection Assessments
- Visual Data Incorporation

**Enterprise Risk Management.** We provide a comprehensive ERM Program assessment that is consistent with ISO 31000, specific application area standards (e.g., NIST CSF for OT Cybersecurity), S&P and emerging ESG standards for energy portfolio and market and compliance risk management best practice. Services are tailored to each utility's needs and include:

- Metrics Support
- Consistent Benefit Analysis
- OT Cybersecurity
- ISO 31000 Assessments

## Client Case Study

Black & Veatch recently completed a comprehensive and innovative asset investment plan for a top-3 utility in the U.S. to support its \$1.5 billion regulatory filing for a 6-year T&D investment plan. The plan objectives were to maximize the risk mitigation and reliability benefits generated from improved grid reliability, resiliency and modernization initiatives.

Benefits and costs were determined for 39 programs at the circuit, substation and transmission line level resulting in a data-driven investment optimization plan with quantified risk mitigation and benefits. Using Copperleaf Technologies™ Asset and Portfolio analytics software, our circuit, substation and line optimization strategy and analysis produced a well-documented and defensible project portfolio to deliver the plan objectives. The investment plan breaks new

ground in tying investment value to customer-level, circuit and system reliability metrics.

The methodology quantifies the reduction of frequency and duration of outage events and converts the benefits to a common value measure across T&D.

The regulatory process required that the plan be repeatable, justifiable and auditable. Black & Veatch's methodology using Copperleaf's technology enables the complex process to be updated as often as necessary. Optimization scenario analysis was enhanced with Black & Veatch-developed dashboards from standard Copperleaf reports.



# Building a World of Difference.®

Bo Poats | Managing Director

**P** 703 608 5568 | **E** PoatsB@bv.com

Debra Henderson | Principal Consultant

**P** 925 389 1267 | **E** HendersonD@bv.com

