

# Asset Health & Substation Modernization Workshop

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CENTER FOR OPERATIONAL  
**EXCELLENCE**

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## Executive Summary

The AEIC's Center for Operational Excellence convened utility executives, engineers, asset managers, and data specialists for a two-day workshop focused on advancing asset health and substation modernization practices. The workshop explored how utilities are adapting to capital constraints, risk-based planning needs, and rising customer expectations while integrating predictive analytics, digital substation technologies, and cross-functional governance frameworks.

The workshop highlighted the following focal points:

- **Shifting from Reliability to Resiliency:** Utilities emphasized the importance of moving beyond traditional reliability metrics to assess system resilience in response to climate-driven events and evolving customer needs.
- **Data-to-Decisions:** Utilities face ongoing challenges with standardizing asset health indices (AHI), integrating inspection data, and aligning condition assessments with investment prioritization.
- **Technology-Driven Insights:** Case studies showcased cloud-based data architectures, GIS and sensor integration, and early-stage digital twin efforts to inform lifecycle planning.
- **Organizational Alignment:** Participants debated how asset management, planning, engineering, and operations can better define roles, break silos, and align around investment decision-making.
- **Risk and Value Frameworks:** Utilities are beginning to implement value-based planning tools that integrate financial, reliability, and regulatory drivers—despite limited data maturity in some areas.
- **People & Process:** Discussions highlighted the critical role of change management, training, and stakeholder buy-in in ensuring new tools and analytics deliver real operational value.

Actionable Insights:

- Develop normalized asset health metrics across asset classes to drive enterprise prioritization.
- Embed risk scores and consequence models into investment decisions, not just asset-level assessments.
- Advance federated data architectures and standard workflows to ensure field data informs planning.
- Prioritize training, storytelling, and governance to accelerate change management adoption.
- Explore early-stage wins in asset decision platforms even before full data maturity is achieved.



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## AEIC Center for Operational Excellence

The mission of AEIC’s Center for Operational Excellence is to provide the electricity industry with authoritative information as a basis for decision-making on local, state, and federal infrastructure investments. The Center facilitates industry projects addressing critical challenges such as supply chain management, grid reliability, electrification, and technological innovation. By fostering collaboration and sharing best practices, AEIC ensures stakeholders are equipped with actionable insights to navigate the dynamic energy landscape. This workshop underscores AEIC’s ability to convene diverse perspectives to tackle industry challenges and advance operational excellence.

## Asset Health & Substation Modernization Workshop Context

Twenty-nine utility leaders convened for this AEIC-hosted Asset Health & Substation Modernization Workshop, aiming to address the complex challenges of maintaining system reliability, advancing resiliency, and optimizing asset investments in an increasingly capital-constrained environment. The workshop brought together asset managers, engineers, planners, and operations leaders to exchange practical insights on developing cohesive asset strategies and modernizing critical infrastructure.

The discussions focused on improving asset visibility, integrating predictive analytics, and aligning asset health data with risk-informed investment decisions. Participants explored how digital tools, such as condition monitoring platforms and portfolio planning models, can support smarter prioritization and greater spend efficiency. The workshop also emphasized the organizational and cultural shifts needed around data governance, cross-functional roles, and change management to enable successful asset modernization at scale.

### Advancing Grid Resiliency & Asset Health Modernization

Case studies and discussions highlighted the convergence of analytics, automation, and institutional knowledge in modernizing asset management. Con Edison detailed their Network Resiliency Index (NRI) and operational tools like OPOT for prioritizing underground and overhead investments. SRP shared their evolution from siloed asset classes to a unified platform via Tactical Asset Management Plans (TAMPs). ComEd emphasized digital substation innovations and standardization of asset health scores across transformers, breakers, and batteries.

Alabama Power introduced their SPEAR and RAMP initiatives: cloud-native analytics platforms that predict weather impact and optimize resource deployment. These systems integrate storm prediction, crew staging, and real-time performance tracking, underpinned by federated lakehouse architecture.

Cross-cutting themes included:

- Differentiating reliability (outage prevention) from resiliency (faster recovery, adaptive response)
- Aligning field-generated data with centralized planning and budgeting
- Clarifying accountability among asset management, engineering, planning, and operations
- Overcoming change management barriers to embed new tools and processes

### Gaps / Challenges

The workshop brought to light a number of critical challenges that utilities are facing as they work to modernize asset health strategies and substation infrastructure. These issues reflect a mix of technical limitations, process fragmentation, and organizational misalignment. Improving asset visibility, establishing consistent health scoring methods, and clarifying cross-functional roles emerged as top concerns that must be addressed to strengthen reliability and resiliency efforts.

Table 1. Key Challenges in Advancing Asset Health & Modernization

| #  | Gap / Challenge                                  | Description  |
|----|--|--|
| C1 | Misalignment of Reliability & Resiliency Metrics | Utilities struggle to balance traditional reliability metrics (SAIFI, SAIDI) with emergent resiliency goals. |
| C2 | Inconsistent Asset Health Index (AHI) Models     | Lack of standardized AHI methodologies undermines confidence in using these scores to guide investment.      |
| C3 | Siloed Data & Tools                              | Data is often fragmented across systems (Excel, GIS, inspection logs), limiting enterprise-wide analytics.   |
| C4 | Unclear Ownership in Capital Planning            | Multiple departments (Ops, Planning, AM, Customer) influence priorities without clear final decision-maker.  |
| C5 | Limited Integration Between AM and Risk          | Risk registers and asset health systems are often disconnected, reducing cross-functional insight.           |
| C6 | Change Management & Adoption Resistance          | New tools face skepticism or lack of usage due to cultural or training barriers.                             |
| C7 | Capital Constraints & Cost-Benefit Uncertainty   | Limited funding and pressure for ROI complicate the case for long-term asset investment.                     |
| C8 | Workforce & Knowledge Gaps                       | Lack of data-savvy staff and asset expertise limits ability to scale analytics or system upgrades.           |

## Path Forward Opportunities

Building on those challenges, the group outlined practical opportunities that utilities can pursue to improve asset decision-making and modernization outcomes. These strategies focused on standardizing tools and processes, strengthening data infrastructure, and embedding risk-informed planning approaches. By acting on these opportunities, utilities can drive smarter investments, better coordinate across departments, and deliver more resilient grid performance.

Table 2. Strategic Opportunities for Resilient Asset Decision-Making

| #  | Opportunity                             | Description   |
|----|---|---|
| O1 | Standardized AHI Across Asset Classes   | Normalize scoring systems to enable enterprise-level prioritization.                  |
| O2 | Federated Data Architecture             | Enable centralized access to analytics while preserving department autonomy.          |
| O3 | Digital Substations & Remote Monitoring | Leverage mobile GIS, sensors, and remote diagnostics to improve condition visibility. |



| #  | Opportunity                         | Description   |
|----|-------------------------------------|---|
| O4 | Portfolio-Level Decision Frameworks | Integrate asset-level insights into strategic tools like Copperleaf and RAMP.             |
| O5 | Value-Based Investment Modeling     | Evaluate tradeoffs across financial, reliability, and regulatory outcomes.                |
| O6 | Proactive Storm Readiness Analytics | Use AI-driven tools (e.g., SPEAR) for crew positioning and outage mitigation.             |
| O7 | Governance & Accountability Clarity | Define who owns project prioritization across departments and funding “buckets”.          |
| O8 | Change Management & Storytelling    | Build buy-in through clear use cases, performance dashboards, and leadership sponsorship. |

## Conclusion

This workshop confirmed a shared recognition: **utility asset strategies must evolve to meet the demands of resiliency, transparency, and performance efficiency.** As systems age and weather threats rise, utilities must optimize limited capital while aligning on risk, data, and operational readiness.

The AEIC Asset Health & Substation Modernization Workshop surfaced both the complexity and opportunity of modern grid management, from standardizing asset scores to embedding storytelling into analytical adoption. Participants left with practical tools, frameworks, and new connections to advance their own journeys.

AEIC will continue to support members through additional forums, working groups, and case-sharing efforts that bridge technical, organizational, and strategic challenges, ensuring utilities are not only prepared for the future, but actively shaping it.