

The NextGen Control Center Workshop

Reimagining Grid Operations



CENTER FOR OPERATIONAL
EXCELLENCE

Association of Edison Illuminating Companies
607 14th Street NW, Suite 560
Washington, DC 20005
www.aeic.org

Executive Summary

The AEIC’s Center for Operational Excellence convened utility leaders and industry partners to explore how the NextGen Control Center can improve reliability, resilience, safety, and customer outcomes by unifying data, systems, and people. Participants examined practical pathways to move from siloed monitoring to coordinated, data-driven operations grounded in governance, common architecture, and continuous learning.

The workshop highlighted the following focal points:

- **Unified operational picture** across ADMS, OMS, DERMS, EMS, SCADA, GIS, AMI, and work management to improve situational awareness and decision speed.
- **People–process–technology alignment:** Alignment across people, process, and technology is the decisive factor. Modernization succeeds through governance, clear roles, and change management, not software alone.
- **Storm and major-event operations** as proving grounds for ADMS/OMS integration (e.g., FLISR, VVO, topology/model accuracy, telemetry, and communications latency).
- **Digital twins and decision intelligence** to test operational scenarios safely and accelerate operator confidence.
- **Cloud- and API-enabled data layer** (e.g., lakehouse) with cybersecurity-by-design and semantic interoperability to scale analytics and AI.
- **Pilot-to-scale discipline:** structured use-case roadmaps, feedback loops, and shared learning networks to shorten time from pilots to production.

Actionable Insights:

- Institutionalize data governance (ownership, quality metrics, catalog/lineage) and align it not only with IT but also with operations.
- Stabilize the network model and telemetry foundations before pursuing automation at scale; data truth precedes FLISR/VVO performance.
- Adopt a cloud–hybrid platform with standardized APIs to integrate OT/IT data and external sources while meeting cyber and regulatory requirements.
- Formalize pilot lifecycles with stage gates (proof, evaluation, scale) and cross-functional sponsorship to avoid “pilot purgatory.”
- Invest in operator-centric tools (role-based views, decision support, simulation environments) and training to embed new workflows.
- Measure ROI beyond reliability by including restoration speed, safety, customer experience, and workforce productivity.



Table of Contents

Executive Summary	1
Table of Contents	2
Table of Tables	2
AEIC Center for Operational Excellence	2
The NextGen Control Center Workshop Context	2
Reimagining Grid Operations	3
Gaps / Challenges	4
Path Forward Opportunities	5
Conclusion	6

Table of Tables

Table 1. Key Challenges in Advancing the NextGen Control Center	4
Table 2. Strategic Opportunities for the NextGen Control Center	5

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.

The NextGen Control Center Workshop Context

Thirty three utility leaders convened for this LIPA-hosted the NextGen Control Center Workshop, aiming to establish a shared, utility-driven view of the target operating model and the governance needed to get there. The convening focused on the practical realities of building a NextGen Control Center amid increasing major-event exposure, accelerating DER interconnections, and ongoing capital and workforce constraints. The workshop brought together utility executives; control center directors and supervisors; distribution planners; outage and emergency

management leaders; grid modernization program owners; enterprise data, cybersecurity, and IT/OT integration teams; and research and vendor partners.

Discussions centered on unifying the operational picture across ADMS, OMS, DERMS, EMS, SCADA, GIS, AMI and work management; strengthening the integrity of topology models and device telemetry; and improving storm restoration performance through ADMS/OMS integration (e.g., FLISR, VVO, switching safety, and ETR communications). Participants examined how a cloud-hybrid data layer with API-first and semantic interoperability can enable analytics and AI while meeting cyber and regulatory expectations; how simulation and digital twins can de-risk automation and rehearse storm playbooks; and how operator-centric decision support and training can embed new workflows.

The group also addressed three areas:

- (1) Portfolio-level sequencing to move from pilots to production with stage-gated lifecycles.
- (2) Value measures beyond SAIDI/SAIFI that include safety, customer experience, and workforce productivity.
- (3) Change management to clarify roles, decision rights, and accountability.

Reimagining Grid Operations

Unifying the view of the grid. Current control rooms often maintain separate views across transmission, distribution, DER operations, and outage management. The NextGen vision centers on a single operational picture integrating ADMS, OMS, DERMS, EMS, SCADA, GIS, AMI, and work management data to provide role-based situational awareness for operators, planners, and field crews.

ADMS/OMS as the operational backbone. Major-event response validated that ADMS capabilities (e.g., FLISR, VVO) depend on accurate topology models, reliable telemetry, and low-latency communications. Where those foundations were strong, utilities demonstrated better isolation, faster switching, improved ETRs, and clearer customer communications.

Decision intelligence and digital twins. Multiple sessions emphasized the value of simulation/sandbox environments and digital twins that allow utilities to test switching plans, validate automation schemes, and rehearse storm playbooks before execution. This reduces risk and builds operator trust in new workflows.

From data stores to learning systems. Presenters consistently framed modernization as an alignment and learning problem. Utilities that progress fastest adopt common data architecture (often cloud-lakehouse), establish governed APIs and semantic models, and institutionalize feedback loops between planning, operations, and analytics.



Human-centered modernization. Technology changes stick when paired with clear governance and roles, operator training, and change management. Organizations are pairing analytics with operator-in-the-loop decision support and concise, role-specific visualizations.

Cross-cutting themes included:

- **Governance first:** clarity on ownership, quality metrics, and decision rights is the prerequisite for integration and automation.
- **Model and telemetry integrity:** topology alignment across ADMS/OMS/GIS/DERMS, device status accuracy, and time-synchronized data streams are essential.
- **API-first interoperability:** standard interfaces and a semantic layer lower integration cost and increase speed to value.
- **Operator experience:** surface the right data at the right time through role-based views and guided workflows; embed simulation for rehearsal.
- **Pilot-to-scale discipline:** stage-gated use-case roadmaps with measurable outcomes; retire what does not scale.
- **Security-by-design:** cyber controls embedded in data and integration layers, not tacked on.

Gaps / Challenges

The workshop surfaced a set of critical challenges utilities face as they evolve the control room into a NextGen Control Center. These reflect a blend of technical limitations (model integrity, telemetry coverage, latency), integration friction across OT/IT platforms, and organizational misalignment around roles, decision rights, and change pace. Closing these gaps, especially achieving a unified operational view, disciplined data governance, and operator-ready workflows, is essential to strengthening reliability, resilience, safety, and customer experience.

Table 1. Key Challenges in Advancing the NextGen Control Center

#	Gap / Challenge	Description
C1	Fragmented Operational View	Separate systems for ADMS, OMS, DERMS, EMS, SCADA, and GIS limit shared situational awareness and slow decisions.
C2	Weak Data Governance	Unclear ownership, limited catalog/lineage, and inconsistent quality rules undermine trust and reuse.
C3	Topology/Model Misalignment	Discrepancies among GIS, ADMS, and OMS models cause automation failures and operator workarounds.
C4	Telemetry and Latency Constraints	Incomplete device telemetry and communications latency degrade FLISR/VVO and real-time analytics.



C5	Integration Friction	Point-to-point integrations and proprietary interfaces increase cost and hinder scaling across use cases.
C6	Pilot Purgatory	Pilots lack stage gates, business sponsorship, or integration plans, preventing transition to production.
C7	Skill and Workflow Gaps	Operators and planners lack shared training, role clarity, and decision-support tools for new processes.
C8	ROI Limited to Reliability	Benefits measurement underweights safety, customer experience, workforce productivity, and resilience.
C9	Cyber and Compliance Drag	Security controls and regulatory requirements are addressed late, delaying integration and cloud adoption.
C10	Event Playbook Variance	Storm/major-event procedures vary across teams and regions; lessons learned are not institutionalized.
C11	Vendor and Tool Sprawl	Overlapping capabilities across platforms increase duplication and training burden.
C12	Change Fatigue	Teams face initiative overload without a clear roadmap, narrative, and pacing for adoption.

Path Forward Opportunities

Building on those gaps, participants outlined practical opportunities that utilities can pursue now to improve operational decision-making and modernization outcomes. Priorities include standardizing the data and integration layers, stabilizing network models and telemetry foundations, embedding operator-centric decision support and simulation, and governing pilot-to-scale lifecycles. Acting on these strategies accelerates time-to-value, improves storm performance, and enables safe automation at scale.

Table 2. Strategic Opportunities for the NextGen Control Center

#	Opportunity	Description
O1	Establish a Data Framework Charter	Define platform, governance, integration, analytics, and feedback layers with roles, metrics, and decision rights.
O2	Stabilize the Network Model	Align GIS/ADMS/OMS models; implement automated validations and change-control for topology accuracy.
O3	Telemetry Uplift and Time Sync	Prioritize device telemetry coverage, communications upgrades, and time-synchronization to support automation.



O4	API-first Integration	Adopt standardized APIs and a semantic layer to reduce integration cost and improve interoperability.
O5	Cloud-hybrid Data Layer	Implement a secure lakehouse for OT/IT data with policy-based access, lineage, and model monitoring.
O6	Operator-centric Decision Support	Provide role-based views, guided workflows, and embedded analytics tuned for control room use.
O7	Simulation and Digital Twins	Stand up sandbox environments to test switching plans, protection settings, and storm playbooks safely.
O8	Pilot Lifecycle Governance	Use stage gates (prove-evaluate-scale), value tracking, and executive sponsors to move from pilots to production.
O9	Metrics Beyond Reliability	Include restoration speed, safety incidents avoided, CX/communications quality, and workforce productivity.
O10	Event Playbook Standardization	Codify cross-functional storm procedures; capture and recycle lessons via after-action reviews.
O11	Training and Change management	Create curricula for operators/planners; communicate a narrative linking investments to operator outcomes.
O12	Collaborative Learning Network	Share use-case artifacts, reference architectures, and ROI measures through AEIC working groups.

Conclusion

This workshop affirmed a shared recognition: **the modern control center must evolve to meet rising expectations for resilience, transparency, safety, and performance.** With more frequent major events, accelerating DER adoption, and persistent workforce and capital constraints, utilities must align governance, data, and operator readiness to move from siloed monitoring to coordinated, data-driven operations.

The workshop highlighted a complex but promising transition:

- Unify the operational picture
- Stabilize topology and telemetry foundations
- Adopt API-first, cloud-hybrid data platforms
- Use simulation and digital twins
- Apply disciplined pilot-to-scale lifecycles



Participants left with practical frameworks, reference patterns, and peer connections to accelerate their own roadmaps.

AEIC will continue to support members through targeted forums, working groups, and case sharing. We will package reference architectures and metrics, advance operator-centric tools and training, and curate reusable artifacts across utilities. This work helps members prepare for the future of grid operations and actively shape it.