

Scaling the Grid & the Art of What's Possible (with AI)

How Utilities Can Use Operational AI to Build Capacity and Unlock Efficiency Today

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Introduction

Electric utilities are being asked to do the near-impossible: build and operate vastly more generation, transmission, and distribution infrastructure—faster, more reliably, and under greater public scrutiny than ever before.

Load growth is no longer a planning forecast tucked into an annual filing. It is arriving now. Data centers, electrification, advanced manufacturing, and reshoring are creating concentrated demand that can exceed what regions once expected to add over decades. At the same time, utilities must contend with aging assets, severe-weather events, workforce constraints, evolving customer expectations, and an increasingly complex regulatory environment.

The industry's central challenge is not simply building more infrastructure. It is building the operational capacity to manage it.

That will not be solved by asking field teams to work harder, replacing every core system, or launching another disconnected AI experiment. It will be solved by making the operational data, systems, and teams utilities already have work together in a more intelligent, responsive way.

That is the promise of Operational AI.

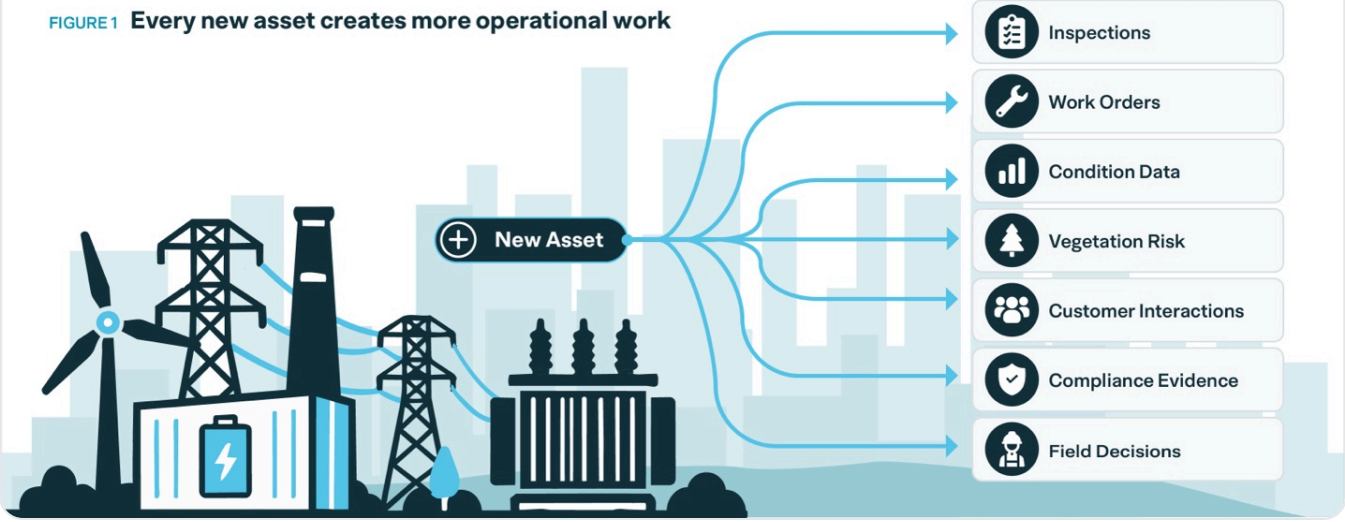
01 The Capacity Constraint Is Operational, Not Just Physical

The debate around grid expansion often centers on steel in the ground: substations, transformers, conductors, generation, storage, and interconnections. All matter. But physical investment alone does not create a scalable operating model.

Every new asset creates more inspections, work orders, condition data, vegetation risk, customer interactions, compliance evidence, and field decisions. Every storm event tests whether the organization can see what is happening, prioritize accurately, dispatch effectively, and close work with confidence. Every delayed handoff, duplicate truck roll, incomplete work order, or unclear asset record compounds the challenge.

Utilities cannot hire, build, and modernize fast enough if the operating model remains fragmented.

FIGURE 1 **Every new asset creates more operational work**



The hard truth is that many critical workflows still depend on rigid, slow-to-change enterprise platforms built for recordkeeping—not real-time operational adaptation. These systems will remain essential systems of record for the utility enterprise. They carry the transactions, controls, and history the enterprise depends on. But they were not designed to dynamically orchestrate field execution across rapidly changing conditions.

They do not replace the judgment of a crew leader standing beside damaged infrastructure. They do not inherently reconcile field reality with system data in real time. And they do not turn every completed task into faster learning for the next one.

Operational AI does.

> **Every delayed handoff, duplicate truck roll, incomplete work order, or unclear asset record compounds the challenge.**

02 Operational AI Is Not Another Dashboard

Too much of the current AI conversation is abstract: chat interfaces, pilots, proofs of concept, and promises of transformation at some distant future date. Utilities have every reason to be skeptical.

Operations does not run on demonstrations. It runs on work completed safely, assets restored quickly, crews arriving prepared, regulators satisfied, and customers kept informed.

Operational AI is built around that reality. It applies AI to the work itself: planning, prioritizing, dispatching, executing, documenting, validating, and improving field operations. It works alongside the data and systems utilities already use, respecting established governance, security requirements, business rules, and operational policies.

The goal is not to rip out SAP, Maximo, Oracle, ArcGIS, OMS, ADMS, or mobile workforce systems. The goal is to make them more operationally effective.

Traditional enterprise software is optimized for structured processes and stable workflows. Operational AI is optimized for the dynamic edge of the utility: where conditions change, data is incomplete, work is urgent, and decisions must be made in minutes rather than weeks.

It connects the office and the field. It transforms scattered information into an actionable operating picture. And it helps people make better decisions without asking them to abandon the systems, controls, and expertise they already trust.

FIGURE 2 **Operational AI works between the field and existing systems of record**



> **The goal is not to rip out SAP, Maximo, Oracle, ArcGIS, OMS, ADMS, or mobile workforce systems. The goal is to make them more operationally effective.**

03 AI Is a Security Concern—Unless It Is an Operational Discipline

Utility leaders are right to be wary of the uncontrolled proliferation of AI. An ungoverned AI tool can create new pathways for sensitive data exposure, inaccurate recommendations, opaque decision-making, and operational risk. In a critical-infrastructure environment, "move fast and break things" is not innovation. It is irresponsible.

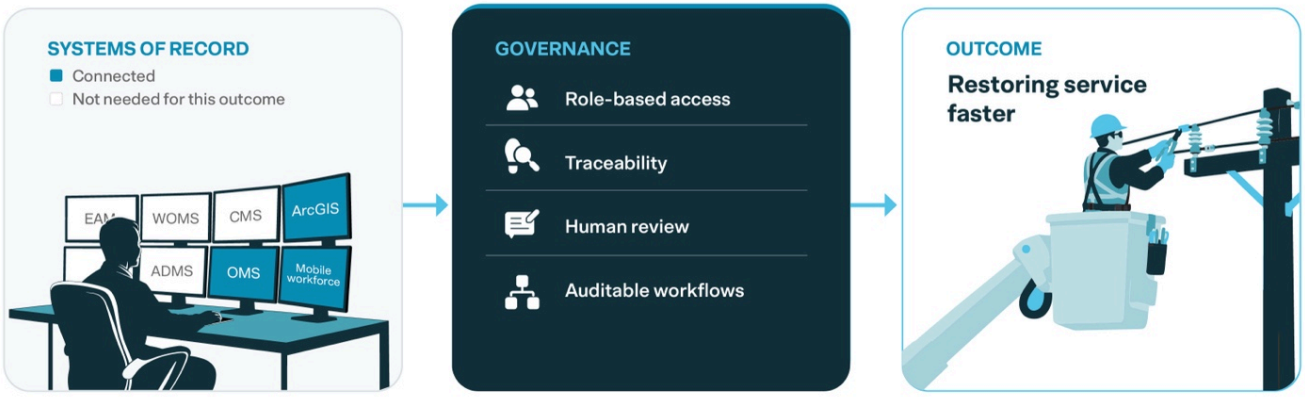
But the answer is not to ban AI or leave it to shadow experimentation across the enterprise. The answer is to deploy AI as an operational discipline.

Operational AI is not a broad, unbounded system that indiscriminately absorbs enterprise data. It leverages only the governed, cross-platform data subset required to orchestrate a specific operational outcome: restoring service faster, prioritizing the highest-risk asset, reducing unnecessary truck rolls, improving work-package quality, or directing the right crew to the right job.

That matters. Not every data source needs to be connected. Not every decision needs to be automated. Not every user needs access to every operational signal.

> **In a critical-infrastructure environment, "move fast and break things" is not innovation. It is irresponsible.**

FIGURE 3 **Only the governed data a specific outcome requires**



A disciplined Operational AI approach is designed to work within the utility's existing data fabric, identity controls, governance policies, approved business rules, and systems of record. It supports role-based access, traceability, human review, and auditable workflows. It can apply the policies that already govern field work—safety requirements, escalation rules, asset priorities, customer commitments, and compliance obligations—at the point where decisions are made.

Properly deployed, Operational AI does not create a parallel universe of ungoverned intelligence. It makes the existing operating environment more secure, visible, and accountable. It reduces the need for manual data movement, disconnected spreadsheets, informal workarounds, and the operational blind spots that emerge when critical information remains trapped in separate platforms.

In other words: the greatest AI security risk may not be governed Operational AI. It may be allowing operational teams to face a more volatile grid with fragmented data, rigid systems, and no intelligent way to act on what they already know.

04 The Scoreboard Matters

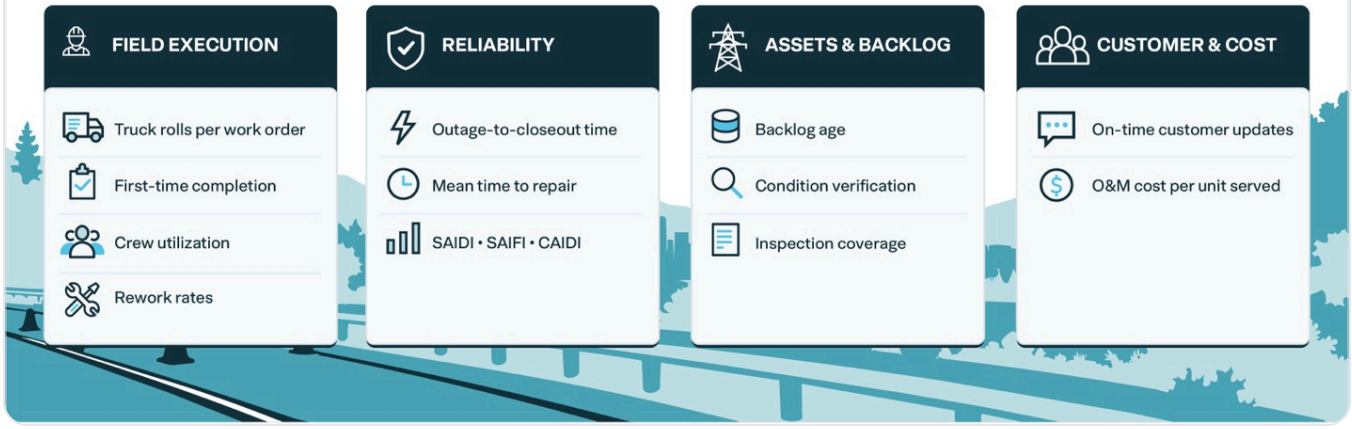
For utility executives, the question is not whether AI is interesting. The question is whether it changes the numbers that define operational performance.

Operational AI should be measured like operations: with clear, measurable outcomes.

A utility deploying Operational AI should establish a baseline and track improvement across metrics such as:

- Truck rolls per completed work order
- First-time completion and "OK on arrival" work-order rates
- Time from outage identification to dispatch, arrival, restoration, and closeout
- Mean time to repair and outage duration
- SAIDI, SAIFI, CAIDI, and customer interruption impacts where applicable
- Crew utilization, travel time, and schedule adherence
- Rework rates and incomplete or rejected work packages
- Backlog age for inspections, maintenance, damage assessment, and corrective work
- Asset-condition verification and inspection coverage
- Customer updates delivered accurately and on time
- O&M cost per work order, per mile, per asset class, or per customer served

FIGURE 4 **The operating scoreboard: baseline, then track improvement**



These are not vanity metrics. They are the operating scoreboard.

A reduction in unnecessary truck rolls lowers cost, fleet wear, emissions, and crew exposure. Better work-package quality raises first-time completion and reduces repeat visits. Faster, smarter dispatch can shorten outage duration. More accurate field capture improves the asset record, reduces compliance risk, and improves future capital and maintenance decisions.

The value compounds. Every field interaction becomes usable operational intelligence rather than another disconnected record.

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That is the difference between generic AI and Operational AI. Generic AI can produce an answer. Operational AI helps produce a better outcome.

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05 Reliability Must Be Built Into the Daily Work

Grid reliability is becoming harder to protect. Severe storms, wildfires, flooding, heat, cyber risk, supply constraints, and aging equipment all create a more volatile operating environment. In many areas, the distribution and transmission grid is being asked to deliver 21st-century performance with assets and software architectures designed for another era.

The response cannot be more rigidity.

During normal operations and emergency events alike, utilities need the ability to dynamically prioritize work based on safety, customer impact, critical facilities, asset condition, crew capability, location, materials availability, and changing field conditions. They need to identify what changed, decide what matters most, route the right work to the right team, and maintain a defensible record of why decisions were made.

Operational AI supports that response while staying governed. It does not replace policy; it operationalizes policy. It can apply approved business rules, escalation paths, safety requirements, access controls, and auditability directly into workflows. Human accountability remains central—especially for high-consequence decisions—while the technology reduces the friction and delay that prevent people from acting on the best available information.

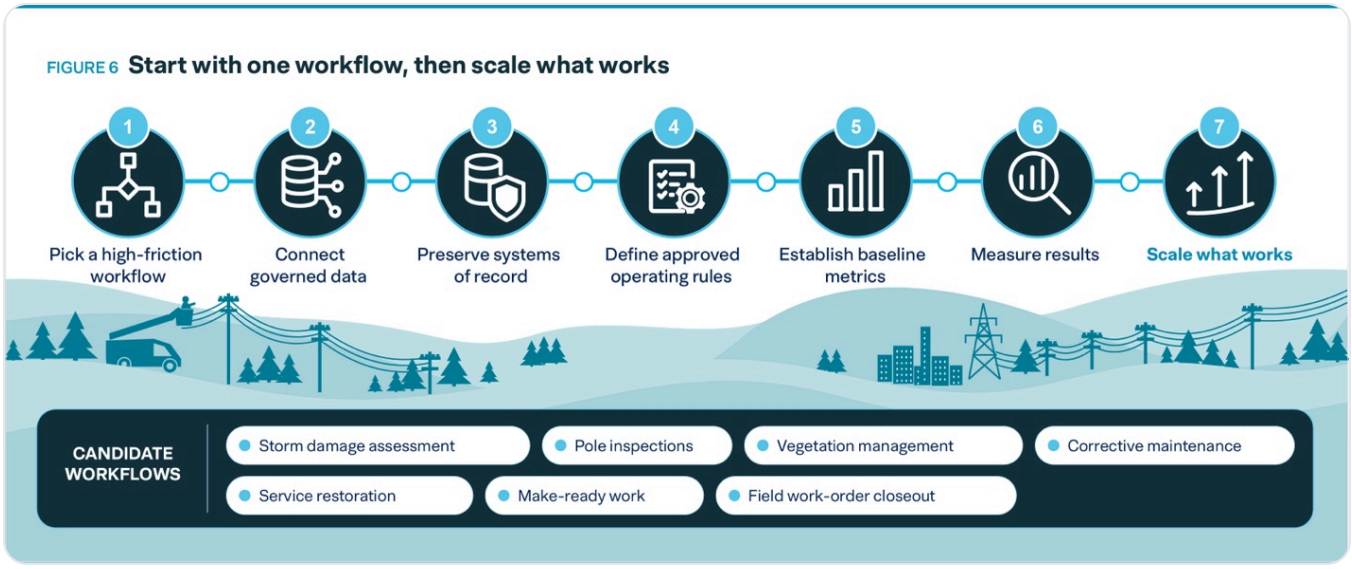
That is how utilities can move faster without sacrificing control.

06 A New Operating Model—Starting Now

The most compelling aspect of Operational AI is that it does not require a multiyear reinvention before it produces value.

Utilities can begin with a high-volume, high-friction workflow: storm damage assessment, pole inspections, vegetation management, corrective maintenance, service restoration, make-ready work, or field work-order closeout. They can connect the relevant governed data, preserve existing systems of record, define approved operating rules, establish baseline metrics, and measure results.

Then they can scale what works.



This is not a strategy for replacing the workforce. It is a strategy for making scarce, highly skilled people more effective. Field crews, dispatchers, planners, supervisors, and asset managers remain the center of utility operations. Operational AI gives them better situational awareness, less administrative drag, more timely guidance, and a faster path from observation to action.

Utilities are entering an era in which infrastructure growth, reliability, affordability, security, and customer trust must all improve at once. The old model—add more systems, add more reports, add more manual coordination—is not built for that moment.

Operational AI offers a different path: use the systems already in place, honor governance and policy, focus on the field, and manage to the scoreboard.

The grid will not meet tomorrow's demand through more software complexity. It will meet it through better operations—measurably, securely, responsibly, and at scale.



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