

White Paper

Transforming Gas Leak Survey Programs

Proven Strategies from Leading Utility Practitioners

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Leak management is a crucial function in gas transmission and distribution operations, and routine leakage surveys are a foundational component of how leaks are managed. The information obtained from leak surveys not only ensure the safety of people and property near pipelines, but also provides system operators with asset health and condition indicators.

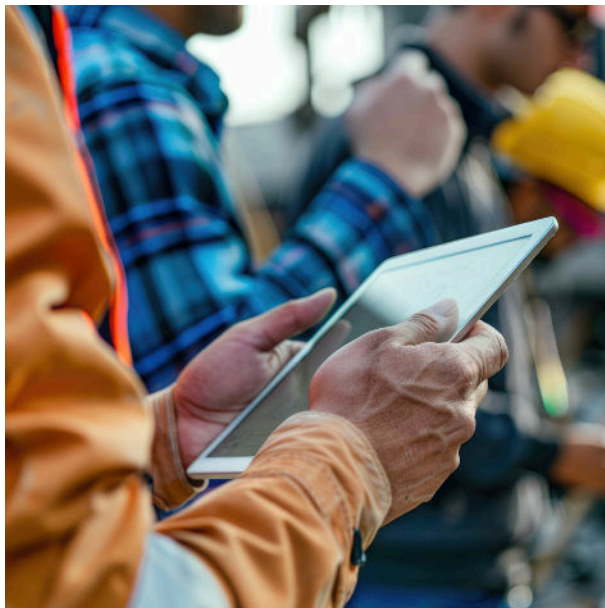
Natural gas utilities face a defining operational challenge: managing gas leak survey programs that meet increasingly rigorous regulatory requirements while simultaneously improving operational efficiency, data quality, and field productivity. As regulatory audits intensify and non-compliance consequences grow more substantial, the industry's traditional reliance on paper-based workflows and fragmented systems has reached a critical inflection point.

Leading utilities are discovering that success requires mastering four interconnected transformation areas that fundamentally reshape how leak survey programs operate.

Redesigning Manual Workflows to Drive Field Productivity

The transition from legacy paper-based processes to modern digital workflows represents far more than a technology upgrade — it's a fundamental reimagining of how critical safety work is executed and documented in the field.

DTE Energy's 15-year transition from homegrown systems to off-the-shelf products illustrates the complexities of this shift. "Parts of our process that we thought were robust became a challenge with the product we selected," explains Michael Cheal, Manager of Gas Innovations at DTE Energy. Modernization efforts must preserve proven workflows while addressing their limitations.



The core challenge lies in the nature of leak survey work itself. Unlike individual asset-specific inspections, leak surveys must cover entire geographic areas as well as the assets that reside within them. Field technicians may walk for eight hours, checking thousands of assets, often in difficult conditions, and require data capture methods that are both simple and comprehensive. "Paper-based, while intuitive and maybe the way folks have done it for a long time, leaves a lot to be desired from a compliance and completeness standpoint," notes Frank Halcarz, Gas Utility Market Specialist at Black & Veatch.

Integrating GIS maps within the field application is essential, as it enables technicians to quickly identify and select specific assets, ensuring

accurate reporting of issues such as leaks, atmospheric corrosion inspections (ACI), and abnormal operating conditions (AOCs). This approach also facilitates the automatic capture of asset type and facility IDs when an asset is selected.

Equally important is utilizing a streamlined user interface (UI) within the field application. Limiting dropdown menus and instead using checkboxes and radio buttons reduces complexity and minimizes errors. This approach also enables automatic asset and location capture and incorporates photo-based reading capture within the field application. "It is important to ensure we limit dropdown or list boxes for technicians, because they almost always create a problem," emphasizes Rajesh Selvam, Principal GIS Consultant at Infosys.

Yet technology alone doesn't drive adoption — or results. "Technology is just the tool — people need to be part of the process from developing the need, understanding the why, and helping implementation," Halcarz explains. Successful programs actively involve field leaders and subject-matter experts in

solution design, ensuring new workflows reflect operational realities and improve consistency and accuracy.

Strengthening Compliance Management and Mitigating Regulatory Risk

With the U.S. Department of Transportation (DOT) Pipeline Safety regulations mandating annual leak surveys and the Pipeline and Hazardous Materials Safety Administration (PHMSA) proposing stricter requirements, utilities face escalating compliance burdens with real financial, operational, and reputational consequences.

The current compliance landscape demands unprecedented precision. Public Service Commissions now require utilities to provide evidence that specific assets — including small cul-de-sac mains with service laterals — were properly surveyed. Michael Nushart, Gas Utility Operations Specialist at Black & Veatch, describes the challenge: "During pipeline safety audits, organizations must demonstrate compliance down to the nth degree. That scrutiny often exposes issues with data integration between the asset relational database and the GIS."

The devil is in the details. When technicians identify below-ground positive indications and above-ground leaks, they must precisely document where each leak originated, how it was identified, and how it was classified. The regulatory reality is stark: "If it's not documented, it wasn't done. And that's how PHMSA looks at things," Halcarz emphasizes.

Leading utilities are adopting an "audit-ready by design" philosophy. Rather than treating audit preparation as a separate activity, compliance documentation is generated continuously as a natural component of day-to-day operations. Stephen Miller, Director of Customer Experience at KloudGin, articulates this principle: "Your business process should be utilizing the exact same information that you would find in an audit. It should never be, 'we're getting audited now, let's go find what we missed.'"

The true cost of compliance gaps extends far beyond potential daily penalties. Extended audit preparation efforts, administrative overhead, and reputational risk often dwarf the cost of the original violation.

Eliminating Data Silos Through Strategic Technology Integration

The most pervasive challenge utilities face is the fragmentation of leak survey data across disconnected systems — GIS platforms, spreadsheets, paper forms, and separate asset management systems. This fragmentation drives operational inefficiency, reduces compliance confidence, and limits strategic opportunities.

Data silos manifest in multiple ways. Different survey methodologies — annual walking surveys, aerial drone surveys, driving surveys — often store data in separate systems that never integrate. When legacy devices fail or connectivity is lost, field technicians revert to pen and paper, creating another data island.

"The most important challenge utilities face today is data across edge systems being out of sync with GIS," observes Rajesh Selvam. "Field technicians end up submitting incorrect information." Enterprise

asset management systems, customer information systems, and GIS platforms frequently operate on different update cycles, creating persistent data quality issues. It is also important to capture and migrate the survey completion date for asset or survey area polygons when transitioning from paper-based to digital surveys. This ensures that the new digital survey system can generate new surveys for the asset or survey area polygons to maintain compliance.

Technology transformations tend to expose these gaps. "As you make that change to digital, you realize that you've got inconsistency between your different systems," Miller explains. "Now those gaps become glaring and apparent." What seemed manageable in a paper-based world becomes indefensible when regulators expect digital precision and traceability. As Nushart succinctly puts it: "All roads lead to data integration."

Beyond operational efficiency, eliminating data silos enables strategic benefits. When leak data integrates with asset records, utilities can identify patterns, justify capital investments, and shift from reactive emergency repairs toward proactive, data-driven asset management.



Implementing Performance Management That Satisfies Multiple Stakeholders

The final transformation area involves evolving leak surveys from a purely compliance-driven activity into a strategic source of asset intelligence that drives operational and regulatory excellence.

The industry is undergoing a fundamental paradigm shift. "PHMSA is pushing operators away from viewing this strictly as a leak management issue toward leak prevention," notes Nushart. This shift requires utilities to move beyond finding and fixing leaks to analyzing the root causes. Different failure patterns — corrosion on bare steel versus well-coated steel, contractor quality issues, or material incompatibility — all demand differentiated responses.

Achieving this requires treating leaks as trackable assets with complete lifecycles — from detection and classification through repair and root-cause analysis. This lifecycle view enables performance measurement across multiple dimensions: compliance completeness, response timeliness, repair quality, and cost efficiency.

Successful performance management requires clear metrics spanning multiple stakeholder concerns. Operations managers track pipeline coverage rates and documentation time. Compliance officers monitor

audit preparation time and violation risk. Asset managers analyze leak density by asset cohort and capital planning insights. Safety directors focus on response times and crew safety metrics.

Ultimately, success is measured by a utility's ability to demonstrate program effectiveness that satisfies both operational efficiency goals and regulatory requirements. Yet utilities must not lose sight of the fundamental purpose behind compliance frameworks. "Companies often focus on compliance because that's what they can leverage to get the funding," Halcarz observes. "But at the end of the day, it's not about compliance. It's about keeping your industry safe."

The Path Forward



Success in modern gas leak survey programs requires an integrated transformation approach across all four critical areas: workflows, compliance, data and performance management. Leading utilities are redesigning workflows with field usability as a priority, embedding compliance into daily operations, eliminating data silos through strategic integration, and implementing comprehensive performance measurement.

Organizations that master these areas position themselves for sustained operational excellence, reducing risk and improving resource efficiency. The transition from paper-based, compliance-focused programs to integrated, intelligence-driven operations is no longer aspirational—it's the new industry baseline.

Cheal's experience at DTE Energy reflects the challenge many utilities face. "It's really a balancing act of how do you serve multiple groups' needs for data versus how do we make it as simple as possible for the end user," he notes.

Centralizing all leak survey results, including leaks, atmospheric conditions, and abnormal operating conditions, in GIS as a single system of record is a best practice. While a single survey provides only a snapshot, layering one to five years of leak survey results in GIS—along with CoreGIS data—creates a trendline. This enables users to identify areas where leak density is increasing, where the same asset class repeatedly fails, or where leak rates correlate with environmental conditions. These trends become powerful indicators of asset health and future risk.

The path forward requires utilities to move beyond the minimum compliance requirements. Miller frames it clearly: "We should be doing more than the minimum. All DOT regs are minimum maintenance requirements." Utilities that embrace this mindset will lead their peers in both safety outcomes and operational performance.

About KloudGin

KloudGin is a cloud-native solution provider delivering the utility and public service's only true "Single Face of Work®" platform that unifies Construction Work Management, Enterprise Asset Management, and Field Service Management within one operational ecosystem. Purpose-built as the operational engine for utility and public sector workers, our AI-native platform eliminates silos between systems and processes, seamlessly connecting all work operations in real time to empower the workforce that keeps essential services running across communities worldwide. Learn more at www.kloudgin.com

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Michael Cheal is the manager of Gas Innovation at DTE Energy. His group is focused on evaluating how to utilize technology to streamline business processes so that teams in the field can become more efficient and unlock new capabilities. Prior to this role, Michael spent more than ten years in performance management of above ground gas work. This involved making visible the efficiency of the team, operational balancing of work/people/priorities and otherwise enabling other leaders to transform data into business insights.



Stephen Miller

Director of Customer Experience – EAM Solutions, KloudGin

Stephen Miller has over 20 years of experience across a variety of asset intensive industries covering: Oil & Gas (EP, Pipeline/Transmission, LNG, etc.), Power Generation (Fossil, Renewables, and Nuclear), Manufacturing, Food Processing, Facilities, Health Care, and Aerospace Manufacturing. Stephen has a very strong background in Maintenance / Asset / Reliability / Inventory / Information Management and Business Process Improvement, including many years of implementing KloudGin, Maximo and SAP for clients of all sizes.



Frank Halcarz

Gas Utility Market Specialist, Black & Veatch

At Black & Veatch, Frank Halcarz manages client engagement for complex, transformational programs, supports the development of business and technical strategy, and provides functional and technical expertise in various aspects of Digital Grid, Grid Modernization, Gas Operational Technology, and OT/SCADA, while contributing to business development as a subject matter expert.



Michael Nushart

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Mike Nushart brings more than four decades of natural gas industry experience and provides data-driven Pipeline Integrity Management and code compliance expertise with a focus on data definition, acquisition, integration and analysis. His experience includes 32 years of direct utility management of gas distribution and transmission, construction, operations, and maintenance with special emphasis on cost effective code compliance and system safety and reliability.



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Rajesh Selvam is a seasoned GIS professional with over 16 years of experience in GIS application development and consulting, specializing in Esri ArcGIS, Schneider Electric's ArcFM, and Geocortex solutions. He brings deep expertise in ArcGIS Enterprise 11 implementations, Esri's UPDM data model, and the Utility Network. Rajesh has a proven track record of managing the full software development lifecycle, translating complex client requirements into innovative solutions, and leading teams to deliver high-quality enterprise GIS projects.