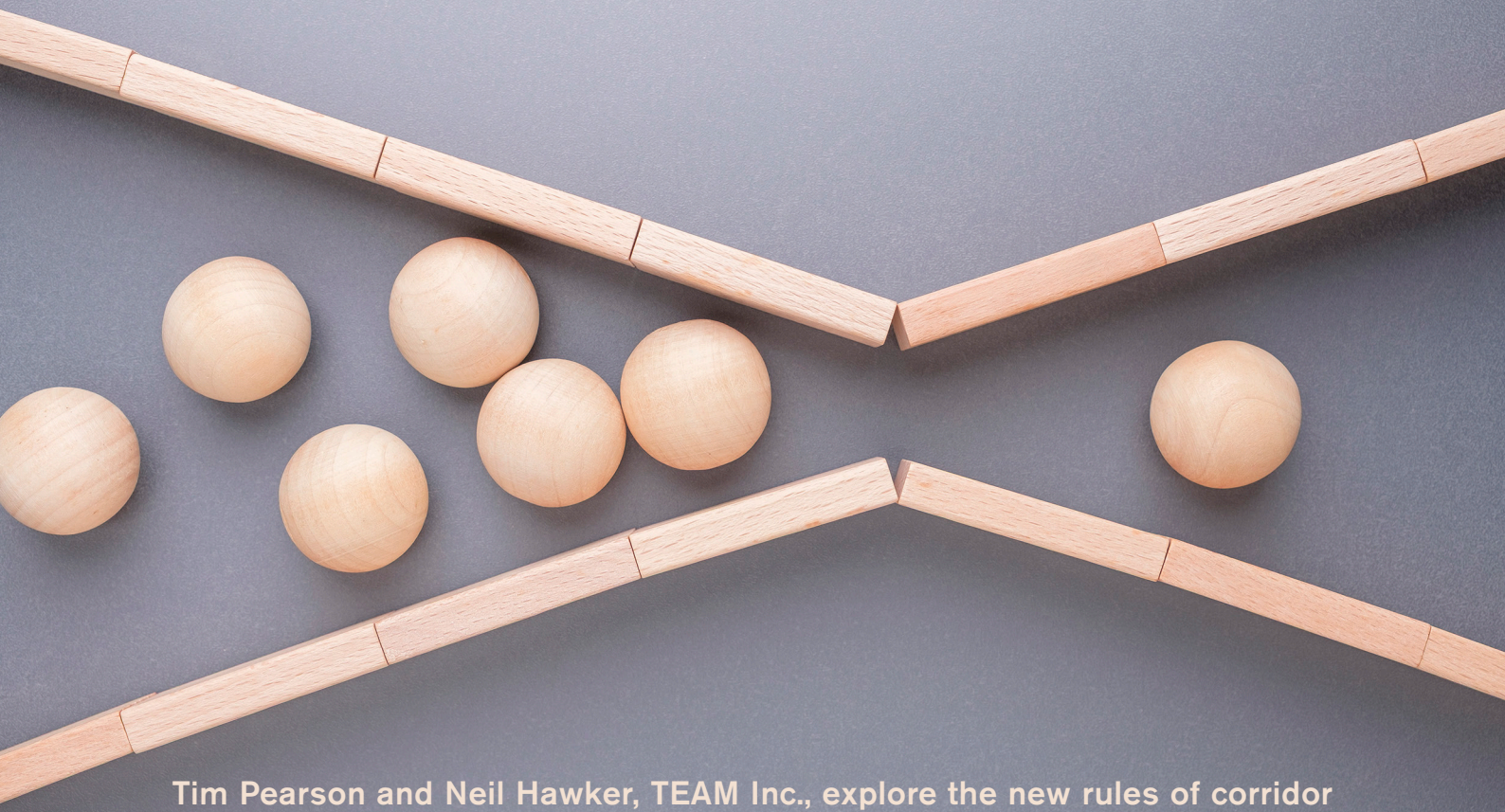
NO BOTTLENECKS, NO BREAKDOWNS



Tim Pearson and Neil Hawker, TEAM Inc., explore the new rules of corridor reliability in the Americas.

Ask an operator managing a high-demand corridor what keeps them up at night, and they likely won't start telling you a story of a dramatic failure. The real nightmare is a slow-burn collapse, the accumulated weight of open inspection findings, deferred repairs, ageing infrastructure, and the creeping awareness that the system is being asked to do more than it was designed to do.

Risk, of course, comes with the territory. But there are extremely effective, proactive ways to manage the likelihood of a stoppage and keep the flow of product going under any condition. And spoiler: they're all connected.

The corridor effect

A high-demand corridor is almost as complex as the human heart, with veins and arteries all working in close proximity, each depending on the health and function of the other. Gathering networks, trunk lines, compressor stations, valve clusters, terminals, interconnects, storage facilities, and delivery points are what make high-demand corridors so productive – and so vulnerable.

In a lower-utilisation network, a defect may remain isolated long enough to schedule, plan, and execute a conventional intervention. In a high-throughput corridor, the same defect can snowball into an operation-halting constraint.

More product, more pressure

Permian gas production is projected to approach 25 billion ft^3/d by 2030. New long-haul pipelines, including Blackcomb, Apex, and Saguaro Connector, are expected to add meaningful takeaway capacity between 2026 and 2028. Brazil's pre-salt production growth continues to place greater demands on midstream systems that were not originally designed for today's throughput profile.

Old steel meets new expectations

In the US, pipelines are commonly designed around ASME standards, assuming a 50-year service life. Many lines are older than that. As assets age, corrosion risk increases, maintaining

inspection consistency becomes harder, and workforce transitions can strain institutional knowledge.

The good news? Failure's not inevitable

Shutdowns and constraints happen when environmental and operational forces layer over the years. In the same way, proactive maintenance strategies might not make a visible difference in the moment, but after years of habitual implementation, they can offset some of the risk.

The bad news? Vulnerability is everywhere

The operators who keep product moving have a clear-eyed view of which risks pose the greatest risk of damage and a game plan for mitigating each one.

The slow burn: corrosion and accelerated wall loss

Corrosion and the pipeline industry have a history as intense as Batman and the Joker. Internal corrosion accounts for up to 30% of pipeline failures in oil and gas operations, with an annual price tag of US$8.6 billion in the US. Impressive numbers. Also, deeply misleading because they don't capture how the pace of corrosion changes as you increase throughput.

High operating pressure, thermal cycling, and H_2S or CO_2 content in transported fluids create conditions for accelerated degradation. Selective corrosion in the heat-affected zones of longitudinal welds, one of the sneakiest failure mechanisms in the business, can drive tensile strength reductions of up to 30% and pit depths of 6 mm before traditional monitoring even raises a flag.



Figure 1. A TEAM Hot Tap Technician completes a hot tap in preparation for a line stop on a liquid natural gas line.

Wall loss that might take a decade to develop on a sleepy low-utilisation line can accumulate in a fraction of that time on a high-volume corridor running at full tilt.

Operators' game plan

1. Deploy composite repair on external corrosion before it escalates

When ILI or external inspection reveals wall loss, composite sleeve repair is often the fastest and most cost-effective way to restore structural integrity without a shutdown. Validated under ISO/TS 24817 and ASME PCC-2 and carrying a 20 year service record on buried high-pressure pipelines, composite systems now cover pipes up to 42 in. NPS across wall loss scenarios up to 80%. What was once a specialty technique is now a standard tool.

2. Address weld zone vulnerability with targeted heat treatment.

The heat-affected zones of welds are disproportionately vulnerable to both corrosion and stress cracking, especially in high-cycling, high-pressure environments. Post-weld heat treatment (PWHT) reduces residual stress in weld zones and significantly lowers the risk of stress corrosion cracking propagating under operating load. On high-demand corridors where welds see thousands of pressure cycles annually, this is a structural must.

3. Upgrade cathodic protection and coating inspection programmes.

External corrosion is heavily influenced by the condition of protective coatings and cathodic protection systems. Regular DCVG surveys, close-interval potential surveys, and coating integrity assessments, particularly on buried segments in high-moisture or corrosive soil environments, identify the locations where the primary defence against external corrosion is already compromised.

What to keep in mind

- Composite repair requires no shutdown or depressurisation.
- PWHT is critical after any in-service welding on high-cycle fatigue lines.
- ILI intervals should be calibrated to operating conditions, not just regulatory minimums.

Third-party damage and external interference

You might think the single most common cause of pipeline failure is corrosion, material defects, or equipment malfunction. It's actually someone with a backhoe who didn't know a pipeline was there. Third-party damage accounts for up to 27% of pipeline incidents globally for US natural gas pipelines specifically. It comes down to one of the most preventable problems in the industry: people digging where they shouldn't because they didn't know what was buried underneath them.

A 2025 explosion in Lexington, Missouri, is the perfect example. A strike on a capped gas main during a drilling project was caused by reliance on records that no longer reflected the conditions in the ground. The consequences were anything

but abstract. In high-demand corridors, the risk compounds in both directions at once. The same urbanisation that's driving construction activity is also raising the cost of any unplanned event. On a corridor moving billions of cubic feet of gas per day, an excavation strike is a throughput, regulatory, and reputational event.

Operators' game plan

1. Modernise your pipeline mapping and records

Legacy records that don't reflect field conditions are a liability that compounds over time. Digitising pipeline location data with GPS-verified accuracy, integrating it with GIS platforms, and keeping it current with any modification to the network is the foundational step. An excavator can't avoid what it can't see on a map.

2. Invest in continuous right-of-way monitoring

Drone patrols, advanced visual inspection, and digital field data collection now offer practical, scalable tools for routine monitoring of pipeline rights-of-way, helping operators identify unauthorised excavation, encroachments, surface anomalies, and environmental threats before they become contact events.

3. Strengthen contractor education and one-call compliance

Operators with the best third-party damage records actively engage with the contractor community around them. Pre-construction briefings, pipeline awareness programmes for local contractors, and coordination with municipalities and utilities on development projects reduce the gap between what's on record and what's happening in the field.



Figure 2. **TEAM technicians completing a 36 in. long reach hot tap.**

4. Inspect for latent damage after every near-miss

A pipeline that is struck but doesn't immediately leak is not necessarily undamaged. Coating damage from excavation contact creates the conditions for accelerated external corrosion. Latent damage to the pipe wall (denting, gouging, or micro-cracking) can propagate to failure under subsequent pressure cycling. Every confirmed or suspected near-miss warrants a focused inspection of the affected segment before returning the line to normal operating pressure.

What to keep in mind

- Pipeline records are only as accurate as their last field verification.
- Drone-based ROW surveillance provides a documented patrol record for regulatory purposes.
- Latent damage from a near-miss can produce a delayed failure months or years later.

Landslides, scour, strain, and the new hazard reality

Geohazards rupture onshore hydrocarbon and transmission pipelines approximately 74 times/y, globally. And this figure doesn't account for near-misses, deformation events that stop just short of failure, or slow-developing ground movements that haven't yet shown up in incident reports.

What makes them so difficult to get ahead of is precisely what makes them so dangerous: they accumulate quietly until they become acute emergencies. Recently, abnormal rainfall patterns have been shaping pipeline crises. The 2022 Satartia, Mississippi CO_2 pipeline failure occurred because heavy rains triggered a landslide that moved the pipe, created axial strain, and caused a full circumferential girth weld failure – and released approximately 30 000 bbls of liquid CO_2. Climate change is accelerating the frequency and severity of rainfall-induced landslides, debris flows, and flooding events at a rate that historical hazard data simply wasn't built to anticipate.

Operators' game plan

1. Build a geohazard inventory before conditions change

Systematic geohazard identification maps every credible landslide, flood, seismic, and subsidence hazard along a corridor, building a risk-ranked inventory and updating it continuously as conditions change. Research shows that operators who implement geohazard management programmes reduced failure rates on baselined pipeline segments from the industry average of 0.02 failures per 1000 km/y, down to 0.004 failures per 1000 km/y.

2. Deploy site monitoring on your highest-risk segments

Tiltmeters, piezometers, InSAR-based satellite deformation monitoring, and fibre-optic strain sensing on high-risk segments provide early warning of ground movement before it reaches

the pipe. Real-time alerts from these systems give operators the lead time to reduce operating pressure, implement temporary isolation, or deploy emergency repair resources before a developing hazard results in a rupture.

3. Integrate geohazard data into your IMP and ILI scheduling

Geohazard exposure should inform the frequency and focus of in-line inspection runs, not just sit in a separate risk register. Segments crossing active landslide zones, river crossings with scour exposure, and lines in seismically active areas warrant more frequent inspection intervals and geometry pig runs specifically calibrated to detect the denting, ovality, and girth-weld anomalies caused by ground movement.

4. Engineer slope and bank stabilisation on chronic hazard sites

Where monitoring identifies a persistent geohazard that cannot be effectively managed through operating adjustments alone, a chronically unstable slope, or a river crossing with recurring scour, engineered mitigation comes into play. Slope stabilisation, bank protection, and pipeline reburial or rerouting at chronic hazard sites have a demonstrated track record of reducing failure probability far more effectively than adjustments to inspection frequency alone.

What to keep in mind

- Historical hazard inventories underestimate future exposure as climate patterns shift.
- InSAR satellite monitoring can detect millimeter-scale ground deformation across large corridor segments.
- Girth welds are disproportionately vulnerable to the stresses geohazard-induced ground movement produces.

Keeping product moving takes a team

The operators with the most reliable corridors are running integrated risk mitigation programmes that treat inspection, repair, emissions monitoring, heat treatment, and data management as a singular workflow, so preventable shutdowns almost never occur.

The case for integration is economic. Every handoff between vendors diffuses response time. In high-demand corridors where every hour of downtime carries a real dollar value, that gap has a cost, and it compounds.

Under TEAM360, every phase of the asset integrity lifecycle connects, from ILI, advanced NDT, robotics, and drone inspection through emissions detection, on-stream repair, live-line intervention, heat treatment, and digital data management, all under one programme, one team, and one unified record in OneInsight®.

The result? Nothing falls through the cracks, and even the most complex corridor is a lean, mean productivity machine.