



INSIGHT

Tank storage provides an essential interface between sea, road, rail and pipeline logistics.

Page 4

TURNING PRINCIPLES INTO PRACTICE: A PRACTICAL APPROACH TO WORKPLACE HEALTH AND WELLBEING

The quarterly magazine from the Tank Storage Association

Also in this issue, we examine the latest sector insights and highlight the initiatives shaping the future of bulk storage and energy infrastructure.



Insight is published by the Tank Storage Association, the voice of the UK's bulk storage and energy infrastructure sector.

To contact the editorial team, please email info@tankstorage.org.uk

TSA Insight Team

Peter Davidson, Jamie Walker, Nunzia Florio

CONNECT WITH US



CONTACT

Tank Storage Association
Devonshire Business
Centre
Works Road
Letchworth Garden City
Herts. SG6 1GJ
United Kingdom

Telephone: 01462 488232

TSA has used reasonable endeavours to ensure that the information provided in this magazine is accurate and up to date. TSA disclaims all liability to the maximum extent permitted by law in relation to the magazine and does not give any warranties (including any statutory ones) in relation to its content. Any copying, redistribution or republication of the TSA magazine(s), or the content thereof, for commercial gain is strictly prohibited unless permission is sought in writing from TSA. Claims by advertisers within this magazine are not necessarily those endorsed by TSA. TSA acknowledges all trademarks and licensees.



Peter Davidson
Chief Executive, TSA

Welcome to the autumn edition of Insight. In this issue, we highlight the proactive steps being taken across the industry to unlock new opportunities: from robotics, satellites, AI and drones transforming the way infrastructure is inspected and managed, to digital solutions creating greater connectivity across terminal operations. Alongside these developments, we explore practical approaches to emissions treatment, thermal insulation, compliance with the Dangerous Substances and Explosive Atmospheres Regulations 2002 (DSEAR), and how operators can integrate climate risk and adaptation into existing safety management systems. I hope you enjoy this new edition of the magazine and don't forget to follow us on social media.

Contents

04 Turning principles into practice: a practical approach to workplace health and wellbeing

06 Satellites, AI and drones: how BPA's innovative use of technology is leading to safer, smarter pipeline management

10 Tank inspection without draining: how robotic technology is changing the approach to above-ground storage tanks

13 UM offers specialist capability at Hull East methylation site

14 From one terminal to 13: scaling right-sized digitalization

17 Mobile emission treatment for complex LNG operations

19 Efficiency built the modern refinery. Will resilience define its future?

21 Spotlight on Teamwork Security & Training Services Ltd.

22 Turning terminal complexity into operational resilience

25 UM head office holds latest Green Day

26 Rethinking thermal insulation: a smarter approach to moisture control and CUI prevention

28 One vessel visit, one shared workspace: removing coordination friction at terminals

30 Hazardous area classification is not enough: taking a holistic approach to DSEAR

33 From climate risk to action: a practical framework for managing NaTech hazards



Page 13



Page 6

TURNING PRINCIPLES INTO PRACTICE: A PRACTICAL APPROACH TO WORKPLACE HEALTH AND WELLBEING

At Grain LNG, we've spent a lot of time talking about health and wellbeing over recent years. Like many organisations operating in a safety-critical environment, we've always understood the importance of keeping people physically safe at work. Increasingly, however, we've recognised the need to place equal focus on wider aspects of health and wellbeing and how they contribute to both individual and organisational success.

That's why the publication of the Principles of Workplace Health & Wellbeing Leadership (backed by the HSE) is so important. The principles provide a clear framework for organisations to think differently about workplace health and wellbeing, encouraging leadership, engagement and continuous improvement rather than treating wellbeing as a standalone initiative or annual campaign.

The statistics behind the principles are compelling. Work-related ill health affects around 1.7m workers in Great Britain with an estimated £14.5bn economic cost. Behind those

numbers are real people whose health, performance and quality of life can be affected by work-related stress, musculoskeletal disorders and other occupational health risks. The challenge for many organisations is knowing where to start.

When people first look at the principles, there's a temptation to think implementation needs a dedicated wellbeing team, significant investment or a complex management system. Our experience at Grain LNG is quite the opposite. The most important message we would share is simple: don't overcomplicate it. The principles are intended to help improve workplace health and wellbeing, not create administrative burden. Every business is different, and what works for a large business may not for SMEs. The key is to identify what will have the greatest impact for your people and start there.

As Stuart Clack, Grain LNG's Health & Wellbeing Lead, puts it: *"Workplace wellbeing isn't about figures or statistics, it's about people. People are often the unseen asset of a business, yet without them success is impossible."*

When we began adopting the

principles, we wanted to keep things simple and practical. We translated them into Grain LNG-specific Principles and then into a clear framework for action through our *10 Steps to Health and Wellbeing Excellence*. These steps embed leadership commitment, risk management, workforce involvement, performance measurement, communication, learning and assurance into everyday operations and decision-making.

By treating health and wellbeing as a core element of operational excellence, we've embedded these principles into our governance, risk management and ways of working. This includes visible leadership from the Grain Leadership Team, integrating health and wellbeing into operational planning, providing the resources and competence needed to manage health risks, and encouraging everyone to play an active role. Together, this helps prevent work-related ill health, support workforce wellbeing, strengthen organisational resilience and drive continual improvement in line with expectations and industry best practice.

Some of those actions are straightforward such as, encouraging managers to make time for wellbeing activities, ensuring employees can raise concerns and contribute ideas, having open and honest wellbeing conversations and sharing learning across the business and with external

partners etc. None of these activities are particularly complex, but together they help create a stronger culture and a healthier workplace. That's perhaps the biggest lesson from our journey so far - incremental improvements can have a significant impact. The vital thing to remember is that doesn't have to be perfect or right first time - it's about learning and progressing at the pace and level that is right for you. In reality, small, meaningful changes often make the biggest difference; starting conversations about mental health, reviewing workplace health risks, improving access to support networks, creating opportunities for feedback - all achievable steps that can be implemented regardless of organisational size.

At Grain LNG, the principles also feed into our wider Health & Wellbeing Strategy. We've aligned them with four core pillars: Mental Health & Psychological Safety, Physical Health & Safety, Occupational Health & Risk Management, and Social Wellbeing, Connection & Support Systems. Together, these pillars underpin a five-year strategic approach that helps us prioritise activity and maintain focus. However, having a strategy is not the objective in itself.

As Stuart explains: *"A successful workplace wellbeing programme is key, and it starts from the top. Leadership sets the tone and ultimately defines the wellbeing culture of the workplace."*

Leadership commitment is core.

Leaders don't need to be health and wellbeing experts, but they do need to demonstrate that workplace health matters, engage with their workforce and create an environment where people feel comfortable raising concerns and seeking support.

Another important aspect is measurement. At Grain LNG, we're a mature business with some developed metrics and indicators that show whether our activities are delivering meaningful outcomes. These measures support the familiar 'Plan-Do-Check-Act' cycle that drives continuous improvement. But again, we'd say, don't be daunted by this. Not everyone will have sophisticated reporting systems or wellbeing dashboards from day one. What's important is establishing some way of understanding what is working, listening to feedback and adjusting over time.

The the Principles of Workplace Health & Wellbeing Leadership themselves recognise that good workplace health and wellbeing management does not happen by chance. It develops through engagement, learning and continual improvement.

For us, that's perhaps the most valuable message of all; you don't need a perfect strategy, a large budget or a dedicated team to begin improving workplace health and wellbeing. You simply need the confidence to start. Build on the

things that already work. Involve your people. Focus on practical actions. Learn as you go.

The principles provide an excellent framework, but their real value comes from adapting them to your own circumstances. Our journey at Grain LNG is only one example. It's not a template for others to follow. Every organisation faces different challenges, has different priorities and starts from a different position. What matters is taking that first step and creating a workplace where health and wellbeing are actively supported. And if the principles help more organisations do that, then they're already making a difference.

For a copy of the Principles of Workplace Health and Wellbeing Leadership, please visit:
www.p-s-f2.org.uk

GrainLNG

Grain LNG – strengthening our team by keeping healthy



SATELLITES, AI AND DRONES: HOW BPA'S INNOVATIVE USE OF TECHNOLOGY IS LEADING TO SAFER, SMARTER PIPELINE MANAGEMENT

BPA is using innovative new technology, including drones, satellites and AI, to bring modern technology to the world of pipeline engineering.



Adam Cruickshank, BPA,
deploying a drone during a
recent project



As a leading pipeline operator and engineer, British Pipeline Agency Limited (BPA) provides specialist engineering and operations services for more than 1,000 km of fuel pipelines in the UK, as well as a number of pumping stations, airport terminals, and bulk storage sites globally.

With more than 50 years of expertise in pipeline management, BPA is using innovative new technology, including drones, satellites and AI, to bring modern technology to the world of pipeline engineering.

Cutting-edge technology provides constant real-time monitoring

For decades pipeline operators have used helicopters to gain aerial views of pipeline sites. The regular flights provide data that helps to identify third-party infringements to pipeline networks. Now, BPA has strengthened its ability to detect and respond to threats to the safety of its pipelines by integrating satellite images, AI software and drones into its existing surveillance programme. The innovative use of technology is

being used by expert technicians to reinforce their own inspections and findings.

For two years now, BPA's Lands Department has been using small, lightweight drones to help maintain and monitor its cross-country pipeline network. The drones capture images and videos of BPA-managed sites, tracking the progress of large-scale developments and allowing land technicians to identify possible third-party infringements that may not be visible from the ground.

Adam Cruickshank, Field Protection Team Leader at BPA, says: "BPA uses drones to support safe and efficient visual inspections of selected locations, helping trained teams monitor change over time and prioritise follow-up checks where needed. It all makes our work much more efficient."

The introduction of drones has proved so effective that BPA is planning to expand its use by rolling out training across the field protection team, which will result in more trained and licensed operators and an increase in the number of drones available.

Using satellite imagery and AI to enhance pipeline safety

As well as drones, BPA has implemented satellite monitoring into its risk management processes. Partnering with LiveEO, AI is used to analyse the pipeline via a range of data delivered by satellites. For

example, AI is able to analyse satellite images of BPA's infrastructure over time, tracking changes and alerting the damage prevention team to potential threats to the integrity of the pipelines. Technicians can then go to the site to investigate any potential damage or infringement and provide feedback. Their findings are fed back into the system, meaning that, as time goes on, the software is becoming more accurate at highlighting potential threats.

Chelsea Dove, Lands GIS Coordinator at BPA, says: "The software is looking for subtle changes that we wouldn't notice on routine patrols, such as trees growing into the sites, gradual

erosion of a riverbank, or changes to land use. These changes are not always obvious during daily or weekly visits but can have a real impact on the safety and integrity of the pipelines." BPA is the first company in the UK to use this technology across its whole system, rather than just small areas of the network.

Novel use of offshore technology

Innovative technology is not only being used for surveillance, but also to inspect and maintain the integrity of the pipelines themselves. Specialist technology that has previously only been used offshore has now been implemented by BPA to help inspect and maintain the safety and

sustainability of their pipelines. The Pathfinder Foam Calliper tool is being used during routine pipeline pigging, a term that describes the maintenance of pipes using specialised devices known as 'pigs'. The Pathfinder tool can clean and map pipelines just like conventional pigging devices, but it can also identify dents or deformations and accurately locate damaged areas.

Traditionally, pigging is carried out using either a metal-bodied pig, which can identify damage within the pipes but cannot confirm the exact location, or by using a very expensive condition measuring tool.

Screenshot from the LiveEO system showing a developing high-risk activity



Richard Price, Integrity Manager at BPA, explains: "The pathfinder tool gives BPA an additional inspection option, helping teams assess pipeline condition more efficiently and support informed maintenance planning."

Although the Pathfinder tool was designed for offshore infrastructure, the team at BPA identified the capabilities of the tool and adopted the technology for use onshore.

Comprised of a medium density polyurethane foam pig with a removable cartridge, the Pathfinder contains sensors that measure the compression of the foam, allowing the tool to identify and measure changes within the pipes.

"Traditionally, you might only inspect the pipelines once every seven years with a very expensive tool and with the need to involve specialist support contractors," Richard says. "Now we can carry out inspections much more often and give ourselves greater assurance that the pipelines are undamaged."

The team's novel use of this offshore technology was presented to industry colleagues at the 2025 United Kingdom Pipeline Operators Association (UKOPA) conference.

"It is important for us to share learning with the wider pipeline engineering sector in order to strengthen the safety and integrity of the UK's pipeline infrastructure," Richard adds.

Using AI to manage the health and efficiency of pipelines

BPA has partnered with Klarian, a leading industrial AI company, to

improve the efficiency of its pipelines and to make significant energy and cost savings.

Using a secure real-time analytics platform called Juno, Klarian initially applied the platform to a critical aviation fuel pipeline, where it helped BPA identify opportunities to improve operational efficiency and asset performance. Using virtual instrumentation and bespoke analytics models, each pump was analysed for efficiency and pressure versus flow curves, system curves, energy costs, and peak efficiency points.

John Armstrong, CEO of BPA, says: "Thanks to Klarian, we were able to make significant efficiency gains and increases in throughput on one of our jet fuel pipelines. Juno not only looks at our efficiency of operation, but also provides early indications of faults, meaning we can carry out preventative as well as reactive maintenance. We're looking forward to seeing what the platform reveals as we expand its use across our network."

After the initial project's success, BPA has approved the expansion of Juno across its wider UK pipeline network.

BPA has also installed two online health monitoring systems on its major pumpsets (integral components that move fluids in the pipelines). Machine Sentry and Sulzer Blue Box both use AI models to analyse data and make recommendations for managing the health of pumpsets, which is critical for operation.

While it is more common to use

just one system, BPA has combined both systems to optimise the health management of its highly critical assets.

"Machine Sentry is great at analysing the health of pumps and specific internal components, whereas the strength of Sulzer Blue Box is in analysing the efficiency of the pump and predicting targeted investment," Richard explains. "Both systems are incredibly helpful and can tell us different things about our assets, which is why we have decided to use both to really understand the health, hydraulic performance and efficiency of our major pumpsets."

Using 3D scanning to examine and repair defects

BPA is now using 3D scanning tools when examining anomalies in its pipelines. Where technicians would previously record defects using photographs, they can now use 3D scanning to provide a digital model of a pipeline, which helps the team with stress analysis and designing repair techniques.

BPA is also supporting academic research into dent fatigue analysis through an approved collaboration with Swansea University, using appropriate data-sharing controls.

The company is also using 3D scanning when replacing internal fixtures within its pumps. Rather than using expensive original castings, the team has been laser scanning existing parts, creating computer models and then 3D printing wax patterns that can be used to make the castings. This process is much more cost-effective and faster than traditional methods.

Setting the standard

As well as using specialist technology to protect pipelines, BPA is also investing in technology that enhances the safety for its workers. Key staff members working in hazardous areas are being given wearable online gas monitors that use modern communication technology to alert staff of potential risks.

The Blackline Safety system sends information back to a central control centre, which will alert team members if an issue has been detected.

John Armstrong, CEO of BPA, says: "We are constantly evolving and looking to the future. By combining decades of industry expertise

with innovative technologies, BPA is helping to shape the future of pipeline management. From advanced monitoring and inspection techniques to AI-driven analytics, these tools enable us to identify risks earlier, improve operational performance and strengthen the integrity of critical infrastructure. While technology provides valuable insight, it is the expertise of our people that turns information into action. Our experienced teams remain at the heart of every decision, ensuring that innovation is applied safely, responsibly and effectively. The knowledge and capabilities developed across our own network also enable us to support our clients throughout the downstream energy

sector, helping them enhance asset integrity, improve operational efficiency and deliver engineering projects with confidence."

For more information, please visit www.bpa.co.uk

Juno screenshot showing pump efficiency



TANK INSPECTION WITHOUT DRAINING: HOW ROBOTIC TECHNOLOGY IS CHANGING THE APPROACH TO ABOVE-GROUND STORAGE TANKS

As tank owners continue to balance compliance, integrity and uptime, robotic inspection technology provides an alternative approach and solution.

NDT Group



Above-ground storage tanks are critical assets across the tank storage, petrochemical, energy and process sectors. They are also among the most challenging assets to inspect efficiently. Traditional internal inspection normally requires a tank to be taken out of service, drained, cleaned, gas-freed and prepared for entry. That process can be expensive, time-consuming and operationally disruptive, while also creating additional safety and environmental considerations.

As tank owners continue to balance compliance, integrity and uptime, robotic inspection technology provides an alternative approach and solution. Working with our specialist technology partner AIS Field, at NDT Group, we are seeing growing demand for in-service inspection methods that provide compliant integrity data while reducing disruption to operations.

Developed by AIS Field, one of the principal technologies available is

RUVI OilDiver, a remotely operated robotic system for the in-service inspection of hydrocarbon storage tank floors. The system is designed to collect ultrasonic thickness data, corrosion-mapping information and visual imagery while the tank remains in service. The system is ATEX Zone 0 certified and is fully compliant with API 653 and EEMUA 159.

An alternative approach to tank inspection

Conventional out-of-service inspection remains necessary where repairs, intrusive assessment, full internal visual examination or confirmation of inaccessible areas are required. However, not every inspection objective justifies the cost and downtime of a total tank shutdown.

Robotic inspection enables operators to gather current condition data, for use to support risk-based forward planning. This can be particularly useful when there is a need to:

- assess tank-floor condition while the asset remains online
- investigate suspected corrosion or metal loss
- support API 653 or EEMUA 159 integrity assessments and engineering review
- prioritise tank planning for shutdown/repair
- gather evidence for remaining-life and life-extension decisions
- reduce unnecessary cleaning, confined-space entry and outage activity

Rather than waiting for a major outage window or committing immediately to a full internal inspection, asset owners can use robotic inspection data to make better-informed maintenance and operational decisions.

What RUVI OilDiver delivers

RUVI OilDiver is deployed through the top manway and tracks across the tank floor while immersed in the stored product. The on-board ultrasonic inspection module records plate-thickness information and maps corrosion, while on-board high-definition cameras capture supporting images and video of the internal condition. Above-ground storage tank floor corrosion is one of the most significant integrity concerns, however, historically comprehensive assessment has only been conducted during out-of-service inspections.

Robotic inspection helps narrow that information gap by providing data while the tank remains operational.

By combining ultrasonic thickness measurement, corrosion mapping, visual data and positional information, the inspection can identify areas of concern, and whilst code compliant, can also be used to support a more targeted integrity strategy.

Coverage and inspection effectiveness are planned for each tank and will depend on factors such as geometry, internal structures, access, floor condition, product and the presence of sediment or sludge.

Extending coverage into the annular ring with PAars

The annular ring is a critical part of storage tank construction. It forms the junction between the shell and the floor and consists of segmented plates extending beneath the shell, both inside and outside the tank wall. Because this region is positioned at the tank perimeter, it is exposed to external environmental conditions, potential underside corrosion and concentrated structural loading from the shell.

Annular plates are commonly of greater thickness than the adjacent floor sketch plates and are connected by butt or lap-welded joints. Their location, however, makes them a challenging area to inspect thoroughly. Both RUVI OilDiver and traditional floor inspection scanners have inherent coverage limitations close to the shell due to the shell curvature.

PAars has been developed to address this critical zone. It is an automated magnetic wheeled scanner attached externally to the tank shell and driven around the protruding outer portion of the annular-ring, the Chime. The system integrates ultrasonic phased-array generating a short range guided wave technique, with a 0-degree ultrasonic configuration to examine the external chime plate condition.

With the capability to detect defects at distances of up to 1 metre from the probe contact position, PAars can

accurately characterise indications up to approximately 40cm. The precise achievable range and characterisation capability will remain subject to the plate geometry, material condition, and surface preparation.

PAars can be deployed as a standalone annular-ring inspection or, more effectively, to complement RUVI OilDiver, ensuring full coverage of the critical peripheral region.

The benefits to tank operators

For operators managing large storage assets, the value of in-service robotic inspection is cost, safety and climate. The most immediate benefit is the potential reduction in downtime. Avoiding an unplanned drain-down and cleaning can save considerable time and cost, particularly on high-capacity tanks where product transfer, replacement storage and outage planning are complex.

There are also clear safety benefits. Reducing confined-space entry and limiting personnel exposure to hazardous internal environments removes or reduces several high-risk activities. Environmental impacts may also be reduced as inherently, tank cleaning generates significant waste, requires residue handling and disposal, increasing the overall footprint of an inspection campaign.

From an integrity-management perspective, robotic inspection improves planning. It allows operators to screen assets, identify priority tanks

and define the likely scope of a future shutdown with real data. Where degradation is identified, outage planning and repair can be more focused. When condition is reported acceptable, the data can support engineering judgement for continued operation until an appropriately planned intervention.

Where it fits within a wider inspection strategy

Although code compliant, robotic inspection is not a universal replacement for internal tank inspection, for example when full internal visual inspection is deemed necessary and/or internal repairs are required. It is also of value, when used as part of a wider, risk-based inspection strategy.

At NDT Group, our role is to help clients define the inspection objective and select the appropriate combination of methods. In some cases, this will mean a full EEMUA 159-aligned out-of-service inspection, supported by floor scanning, visual inspection, weld examination and engineering assessment. In other cases, RUVI OilDiver and PAars can provide code compliant critical floor and annular-ring data while the tank remains online.

The key is to understand both the capability and the limitations of each method. Tank geometry, product, operating conditions, access, coating, sludge, internal fixtures and required inspection coverage must all be considered before confirming the final scope.

Why experience still matters

Advanced technology is only part

of the solution. The quality of the outcome still depends on inspection planning, safe deployment, qualified personnel, data quality, interpretation and clear reporting. NDT Group combines tank inspection experience and project delivery with AIS Field's specialist robotic platforms to provide clients with usable condition information rather than stand-alone data.

In high-risk sectors, inspection must do more than satisfy a procedural requirement. It must provide a defensible understanding of asset condition, identify uncertainty and support the next engineering and commercial decision.

As the tank storage industry looks for safer and more efficient ways to manage ageing assets, robotic inspection in-service is becoming an increasingly important part of the integrity toolkit. RUVI OilDiver provides online corrosion-mapping, thickness and visual data, complimented by PAars extending the inspection to cover the critical annular-ring region, offering operators a practical means of achieving code compliance without disturbance to production.

If you are reviewing tank integrity, planning an outage or assessing whether an online robotic inspection is appropriate, NDT Group can help define the inspection objective, review the tank-specific constraints and develop a suitable scope.

About NDT Group

NDT Group provides both conventional and specialist non-destructive testing services, supporting industries where safety, compliance and uptime are critical. Whether you're operating a COMAH-regulated facility, offshore platform or manufacturing plant, we help you detect issues early, reduce downtime and make confident, data-led decisions.

Formed out of a need for a more agile way of working, NDT Group prides itself on being ultra-responsive with rapid report turnarounds and an ever-evolving, full-service toolkit built through expert partnerships. Our PCN Level 2 qualified technicians deliver rigorous inspections across a comprehensive range of NDT disciplines, while our IRATA-certified rope access teams provide safe, efficient access to even the most challenging environments - without the cost or delay of scaffolding.

From routine assessments to complex EEMUA 159 and EEMUA 225 tank inspections, we deliver the assurance that your site and equipment are safe, every time. Because when the pressure's on, precision matters most.

www.ndtgroup.co.uk

UM offers specialist capability at Hull East methylation site

UM Terminals prides itself on being able to meet the full range of customer requirements across its various UK sites. One of its main centres of activity is Hull where it has its Hull West and Hull East sites. Hull East includes UM Terminals' specialist methylation facility where there is an opportunity from early next year for a new customer seeking the specialist support that the company can provide. Bulk products are received by ship to a dedicated shipping berth and taken out by road. The full capability at the Hull East methylation site includes:

- Dedicated storage facility with four bulk tanks (total capacity of all four tanks is 9984m³)
- Three dedicated shipping lines
- Two loading bays with top loading gantry with scope for modification to increase loading/dischARGE bays
- Blending/dilution option with the

12 x D tanks

- SCADA system - Overfill protection system on all bulk tanks
- Excise warehouse
- Emergency shutdown system - stop buttons in various locations.
- Tank deluge system
- Laboratory onsite (if required)
- Fully secure terminal with controlled entry/exit gates
- Demineralised water plant (if required)
- Nitrogen tank (if required)
- Exclusive UM Terminals shipping berth
- A skilled and highly experienced operational team - trained in bulk liquid operations and emergency preparedness
- ISO 9001 certified

Ben Maynard, Hull East's Terminal Manager, said: *"The facility would ideally suit a single customer seeking a large site and with the potential*

for further expansion if required.UM Terminals prides itself on the personal, bespoke service we offer customers which means that, for the right customer, we can tailor our methylation facility to meet their exact needs whether that includes expanding or modifying facilities. We have a small, highly knowledgeable and personable team who have a proven track record of building long-term, effective relationships with our clients."

The Hull terminals are part of the UM Terminals strategic capability across the UK with other terminals located at Liverpool and Portbury.

During the last couple of years, UM Terminals has undertaken a programme of investment across a number of its sites, including Hull East and West, ensuring its facilities continue to be of the highest possible standard, while also meeting some of the bulk liquid storage requirements of newer customers which have been onboarded more recently.

Vic Brodrick, UM Terminals' Managing Director, said: *"All of our teams have a can-do attitude and pride themselves on going above and beyond to meet our customers' needs. We have many examples, not just in Hull but across all our terminals, where we have grown with our customers and established long-term partnerships."*

Anyone interested in finding out more call +44 (0) 151 933 1010 or email vic.brodrick@umgroup.com



FROM ONE TERMINAL TO 13: SCALING RIGHT-SIZED DIGITALIZATION

Why terminal digitalization should start with reality, daily use cases and the people operating our infrastructure.

GiZiL



Europe's energy infrastructure is being asked to do two things at once: remain safe, reliable and efficient today while preparing for a changing energy system tomorrow.

Few companies illustrate this scale of responsibility better than VAROPreem. Created following VARO Energy's acquisition of Preem, the new energy company combines major industrial and distribution infrastructure across Europe. Its strategy brings together energy security, reliability and sustainability, supported by an extensive network of manufacturing hubs and terminals.

For terminal operations, this transformation creates an important question: how do we modernize existing brownfield infrastructure in a practical and scalable way?

The digitalization journey between VAROPreem and Gizil offers one approach

It started with one terminal in Cologne in September 2025. After validating the approach in daily use cases, the journey expanded to three additional terminals. Today, it is scaling across 13 terminals in Germany.

The principle is simple: start with

reality, focus on how people actually work and scale what creates value.

Right-sized digitalization for brownfield terminals

Tank terminals are not greenfield facilities. Many have evolved over decades through extensions, modifications and changing operational requirements. Yet industrial digitalization is often approached as if every facility needs to be digitally rebuilt from scratch.

Detailed 3D modelling has its place, particularly in engineering and construction. But does an operator need a fully modelled terminal to find an asset? Does a central engineer need it to remotely review an installation? Do teams need it to prepare a Management of Change discussion? Often, the answer is no.

By connecting laser scan reality, P&IDs, asset data and technical documentation, terminals can create a trusted visual environment based on the facility as it exists today.

The objective is not to create the most complex digital twin. It is to make the terminal easier to understand and use. That is right-sized digitalization.

Daily use cases drive digital adoption

Technology alone does not create digital transformation. People using it in their daily work do.

Can an engineer review a site before travelling?

Can an operator visually locate an asset and find the correct documentation?

Can engineering and operations review a proposed modification while looking at the same physical environment?

Can several departments investigate an incident using one shared facility view?

These practical questions shaped the VAROPreem journey. The same Virtual Plant environment can support multiple workflows rather than introducing another isolated tool for every use case.

Remote visibility: bringing the terminal to the expert

Central functions and specialist teams often support multiple terminals. Some site visits are essential. Others happen because the required visual information is simply not available remotely.

Reality-based infrastructure visibility allows teams to navigate installations, locate equipment and review surrounding conditions before travelling. The purpose is not to eliminate site visits. It is to reduce unnecessary travel and make necessary visits more effective. For geographically distributed terminal networks, bringing the terminal to the expert can be as valuable as bringing the expert to the terminal.

Workforce transition: supporting the next generation of operators

One of the industry's greatest challenges is knowledge transfer.

Experienced operators and engineers hold decades of facility knowledge. As the workforce changes, terminals need practical ways to make this knowledge accessible to a new generation.

We should also be realistic: operators are not engineering specialists, and we should not expect them to be.

P&IDs, asset hierarchies and complex technical documentation can take years of experience to interpret confidently.

A visual environment changes how this information is accessed.

Within Virtual Plant, 1D asset information, 2D engineering documents and 3D facility reality are connected. Users can visually find an asset, move directly to the corresponding P&ID and access related documentation. The aim is not to replace experience. It is to make knowledge easier to transfer, shorten learning curves and give the next generation better tools to understand complex infrastructure safely.

Management of Change: fewer grey areas before execution

Management of Change starts with a basic question: what is actually there today?

In brownfield facilities, physical reality,

drawings and asset information may have evolved at different speeds. By connecting current facility reality with engineering information, operations, engineering and external stakeholders can review the same infrastructure context before a modification begins.

The value is straightforward: fewer grey areas before design and execution.

LOTO: adding visual context to safety-critical workflows

Lockout Tagout is one of the workflows now being brought into the digital environment.

LOTO depends on clarity between operations, maintenance and engineering. Connecting isolation information with visually identifiable assets and engineering context can make planning and communication easier to understand. For safety-critical workflows, information should not only be available. It should be clear.

Root cause analysis: one shared facility view

Incident investigations rarely involve one department. Operations, maintenance, engineering, HSE and external specialists may all need to understand the same event.

A shared reality-based environment provides a common point of reference. Instead of working from separate photographs, drawings

and descriptions, stakeholders can review the same physical context together. This is where infrastructure intelligence moves beyond engineering and becomes useful across the organization.

CMMS readiness: better systems need better asset data

Even the most advanced CMMS depends on the quality of the information behind it.

Brownfield asset data is rarely static. Equipment is replaced, tags change and modifications accumulate over time. Reality-based validation allows asset information to be verified and structured against actual site conditions before it enters the maintenance environment. Within the programme, validated asset information has supported a reliable foundation for CMMS implementation.

Digital maintenance does not start with software. It starts with knowing the assets.

Connecting design with existing reality

Terminals will continue to change as infrastructure adapts to new products, energy carriers and operational requirements.

Point cloud reality can be combined with BIM and CAD design models, allowing proposed modifications to be reviewed against existing infrastructure and supporting spatial validation and clash analysis before construction.

Importantly, this does not mean modelling an entire terminal. Reality and design models can work together in a hybrid environment, applying detailed modelling only where the use case requires it.

Again, right-sized digitalization.

From one site to a scalable digital foundation

The journey from Cologne to 13 terminals demonstrates a practical

approach to multi-site digitalization. Start with one facility. Validate real use cases with the people working there. Build on a trusted representation of existing infrastructure. Then scale what works.

As terminal networks evolve, a common digital infrastructure layer can also support greater consistency in how assets, engineering information and documentation are accessed across sites. The next phase can go further. Selected PLC, automation or sensor data can be connected with the visual facility environment and BI dashboards, creating a path from infrastructure visibility towards operational intelligence.

But the sequence matters.

Before analytics or AI can create meaningful value, we need reliable context. What is the asset? Where is it? Which system does it belong to? Which drawing and documents are connected to it?

The terminal industry already has enormous amounts of data. The opportunity is to make that data understandable in the context of physical reality.

From one terminal to 13, the VAROPreem journey shows that scalable digitalisation does not have to start with the biggest technology programme.

Start with reality. Prove the use cases. Then scale.

For more information about Gzil, visit <https://gzil.de/>



MOBILE EMISSION TREATMENT FOR COMPLEX LNG OPERATIONS

Non-stationary vapor combustion and nitrogen supply as a controlled alternative to conventional ventilation.

ETS Degassing
MOBILE EMISSION TREATMENT

David Wendel, Managing Director,
ETS Degassing



Tanks, ships, pipelines and process equipment must often be emptied and in gas-free condition before maintenance and inspection work can begin. When equipment has previously contained flammable or toxic gases and vapors, creating a clearly defined and safe internal atmosphere can become a considerable technical challenge.

Mobile equipment provides the required treatment capacity flexibly and directly on site. Depending on the application, several technologies can be deployed together in a temporary setup, including mobile vapor combustion, nitrogen supply, compressed air and continuous gas monitoring. In a recent project in France, ETS Degassing safely treated the residual emissions in LNG fuel tanks and prepared the tanks for dry dock work.

LNG tanks require controlled preparation

Preparing LNG tanks for maintenance is particularly safety-critical, as the tank can still contain atmosphere with a high methane concentration even after the liquid LNG has been

removed. Cold tank surfaces or small quantities of residual liquid may continue to generate vapor while the tanks warm.

The internal atmosphere is therefore not static. Methane concentrations may also continue to change throughout the operation and must be measured and managed accordingly. For a safe handling of LNG tanks, the residual methane needs to be removed in a controlled way. Pressure, gas concentration, oxygen content and flow conditions must remain within approved limits throughout the operation.

Mobile setup for the project in France

As conventional ventilation was not permitted, a fully controlled technical solution was required for the project in France. Therefore, ETS Degassing provided the customer with a mobile emission treatment setup including a mobile vapor combustion unit, a nitrogen vaporizer, compressed air, temporary hoses and pipework, gas measurement equipment as well as process and safety controls. The equipment was used for the degassing and treatment of two LNG tanks with a volume of approximately 1,750 m³ each. The goal of the project was to remove the residual methane atmosphere, establish safe conditions and prepare the tanks for maintenance work at the dry dock. Together, our units provided the temporary technical capacity required for the project without the need for permanent LNG treatment infrastructure at the maintenance location.

Mobile vapor combustion for residual gas treatment

The mobile vapor combustion unit was used for the degassing of the LNG fuel tanks. Residual gases and vapors were transferred from the tanks through pipework and directed to the combustion unit for controlled treatment. With a thermal capacity of 10 MW, the equipment provided the treatment required for two tanks of this size.

ETS Degassing mobile vapor combustion units are available in different combustion capacities and can destroy gases, gas mixtures and vapors from the explosion groups IIA, IIB, and IIC with an efficiency of over 99.99% and without an open flame. The mobile units enable flexible emission treatment and are especially suited for locations without permanent infrastructure. Besides degassing tanks, ships and pipelines, mobile vapor combustion units can also be used for the temporary replacement of stationary emission treatment systems such as vapor recovery units (VRUs).

Nitrogen for inerting and purging

Using nitrogen is essential when oxygen must be displaced without creating a flammable intermediate atmosphere that would be created by introducing air directly into a methane-rich tank. Before oxygen is allowed to enter the tank, the methane concentration must therefore be reduced under inert conditions. Nitrogen is used as an intermediate medium because it does not support unwanted reactions such as oxidation. By introducing gaseous nitrogen into the tank, the methane-rich atmosphere can be

displaced and diluted while the oxygen concentration remains low. The concentration within the system is reduced to a level where an explosive atmosphere can no longer form. At the same time, residual gases and vapors can be displaced from the equipment. This creates the conditions required for safe inspections, maintenance and cleaning.

Purging with nitrogen is essential for inerting and purging LNG tanks and other systems that have contained flammable products. Our mobile nitrogen vaporizer converts nitrogen from liquid to gas, nitrogen can be introduced into the tank in this form. Their trailer-mounted design allows for flexible transportation and enables nitrogen purging directly at the site of operation. The atmospheric vaporizers are equipped with nitrogen storage tanks.

Complementary technologies for LNG maintenance

For LNG maintenance work, mobile vapor combustion units and mobile nitrogen vaporizers complement one another. The combustion unit ensures the efficient emission treatment, while the nitrogen ensures an inert and safe environment inside the tank.

Once the methane concentration has been sufficiently reduced under inert conditions, compressed-air equipment may be added to replace the nitrogen atmosphere. Gas measurements are also required during every phase. Methane concentration, oxygen content, tank pressure and equipment operating conditions provide the basis for deciding when the next stage may begin.

The deployment in France shows an important advantage for shipowners and dry-dock operators. Specialized LNG treatment infrastructure does not need to be installed permanently at every maintenance location. Mobile combustion, nitrogen and compressed-air capacities can be deployed temporarily for the duration of a project and configured around the vessel's tank design and local port conditions.

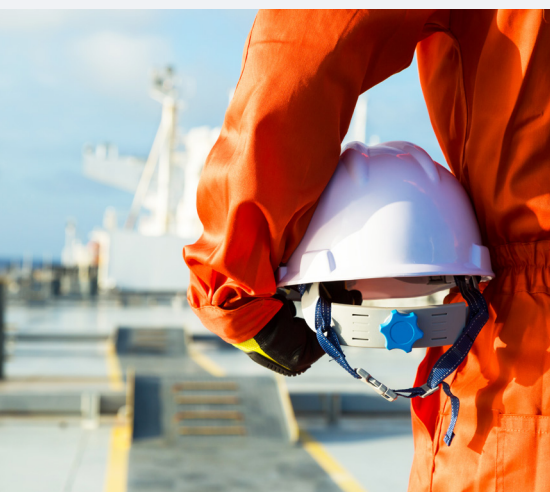
This project marked our first LNG operation of this kind in the Mediterranean region, following comparable applications in Rotterdam. The deployment shows how mobile technologies can be combined for complex LNG work. The vapor combustion unit provides the required gas treatment capacity, while the nitrogen vaporizer enables controlled inerting and purging. For shipowners, terminals and industrial operators, this modular approach offers an important advantage: specialized technical capacity can be brought directly to the asset, configured around the specific task and used only for the period in which it is required.

Contact: David Wendel, ETS Degassing GmbH | +49 162 243 34 86 | sales@ets-group.com

EFFICIENCY BUILT THE MODERN REFINERY. WILL RESILIENCE DEFINE ITS FUTURE?

For more than three decades, Europe's refining sector has pursued one overriding objective: efficiency.

ambipar[®]



Operators have streamlined supply chains, rationalised storage, streamlined inventories and maximised asset utilisation. The result is a sector that is leaner, smarter and better equipped to compete in a challenging global market. But recent geopolitical events raise an important question: have we become so focused on optimisation that we have overlooked something equally valuable?

Conflict in the Middle East, the continuing impacts of the war in Ukraine, disruption to Red Sea shipping, and volatility across global energy markets all point to a changing operating environment. Uncertainty is no longer an occasional disruption. It is becoming a persistent business condition.

Recent discussions between the European Commission and Member States over oil and gas supply risks reflect that reality. Even without an immediate supply crisis, the question is increasingly not simply whether Europe has enough crude oil or refined products, but whether its refining operations, supply chains

and supporting infrastructure have enough flexibility to absorb disruption. Historically, efficiency and resilience have often been treated as competing priorities. Efficiency removes excess capacity, reduces costs and maximises utilisation. Resilience requires contingency, flexibility and sometimes capacity that may not appear commercially optimal during periods of stability. That distinction is becoming increasingly outdated. In a more unpredictable world, resilience should be considered part of operational efficiency, not an alternative to it.

The risks facing refiners are changing too. Traditional planning has understandably focused on preventing shortages, but today's challenge is increasingly volatility: in shipping routes, crude availability, feedstock quality, product demand and energy prices.

Individually, these factors may not create a crisis. Together, they can place significant pressure on refinery operations and the wider supply chain. Success therefore becomes less about predicting the next disruption and more about being able to adapt when it arrives.

Storage is one area that deserves renewed attention. For years, storage has largely been measured through utilisation, throughput and financial performance. These remain important metrics, but storage provides something else: options.

Additional capacity can give operators time to respond to changing supply

patterns, accommodate different crude grades, manage fluctuations in demand, adjust logistics and maintain customer commitments without immediately compromising operational continuity. During disruption, time is one of the most valuable commodities available. Storage can create that time.

This is particularly relevant as Europe's energy system evolves. Refining capacity is changing, dependence on imported products has increased in many markets, and operators are investing heavily in renewable fuels, alternative feedstocks, decarbonisation and digital transformation.

These investments are essential, but they also introduce new dependencies and greater supply chain complexity at a time when global trade is increasingly exposed to geopolitical instability. The industry is being asked to deliver sustainability, profitability and resilience simultaneously.

The challenge is that resilience is difficult to quantify. The financial benefit of reducing storage capacity or increasing asset utilisation is relatively easy to demonstrate. The value of flexibility is harder to prove before it is needed.

Yet boardrooms are increasingly having to ask different questions. How flexible is our supply chain? How quickly could we adapt to alternative crude sources? Where are our critical vulnerabilities? How much resilience have we built into our operations? These are no longer purely operational questions. They are questions of business continuity, competitiveness and, ultimately, energy security.

From our experience supporting organisations through operational and environmental incidents, one lesson is consistent: those that recover most effectively are often those that invested in preparedness before disruption occurred. Preparedness

can look like an unnecessary cost when everything is working as expected. Its value becomes clear when circumstances change.

The current instability in the Middle East may not result in significant disruption to European energy supplies. Markets may stabilise and supply chains may continue to perform well. But the wider lesson remains: uncertainty itself has become part of the refining industry's operating environment.

Efficiency built the modern refinery and will remain fundamental to its future. The next competitive advantage may belong to those organisations that become equally accomplished at building resilience. Because resilience is no longer simply about preparing for the next crisis. It is about creating the flexibility to succeed in whatever comes next.

For more information, please visit www.ambipar.com



Teamwork Security & Training Services Ltd.

Teamwork Security & Training Services Ltd. is a trusted provider of specialist security, compliance and training solutions, supporting organisations across the UK's ports, terminals, maritime and wider industrial sectors. With extensive operational experience and a practical understanding of the complex environments in which our clients operate, we work closely with organisations to help strengthen security, maintain compliance and ensure their teams are equipped with the knowledge and skills they need. Our approach is built around providing professional, dependable and tailored support, recognising that every site, operation and security requirement is different.

Our services cover a comprehensive range of security, compliance and training requirements, including ISPS Code compliance, security audits, exercises and drills, Port Facility Security Officer (PFSO) training, security awareness and search training, X-ray refresher training, Dangerous Goods Safety Adviser (DGSA) monitoring, and Drug & Alcohol testing.

We also provide professional manned guarding and event security services, alongside comprehensive background screening to help organisations strengthen their recruitment, security and due diligence processes.

Our background checks include identity verification, DBS checks, social media screening, and court and press searches.

We pride ourselves on building long-term relationships with our clients, becoming a trusted extension of their teams rather than simply a service provider. From ongoing compliance support and annual exercises to specialist training and site-specific security requirements, our focus is always on delivering practical solutions that work in real-world operational environments.

The tank storage sector plays a vital role within the UK's critical infrastructure and presents its own unique operational, safety and security considerations. Working with organisations operating within this sector has given our team a strong understanding of the importance of robust security procedures, well-trained personnel and a proactive approach to compliance.

We are therefore delighted to be returning to the **Tank Storage**

Association Conference in September for our third consecutive year. The conference has become an important date in our calendar, providing a valuable opportunity to reconnect with clients and industry colleagues, meet new people and hear about the latest developments, challenges and opportunities shaping the tank storage sector.

We look forward to another fantastic event and to continuing to support organisations across the tank storage industry with their security, compliance and training requirements.

Teamwork Security & Training Services – supporting safer, stronger and more resilient operations.

Find out more:

W: teamwork-security.co.uk

E: enqs@teamwork-security.co.uk

T: +44 (0) 1752 425424



TURNING TERMINAL COMPLEXITY INTO OPERATIONAL RESILIENCE

Future-ready terminals need more than cloud software or isolated automation. They need an independent operating layer that connects IT and OT, brings operational data into context, and keeps future technology choices open.

OpenTAS 

Monica Hildinger, Co-CEO,
OpenTAS



customer changes a nomination. Planning adjusts the schedule. Operations revise the loading sequence. Inventory, documents, automation systems, and external interfaces must follow.

In a connected terminal, this is a controlled process. In a fragmented environment, the same change can trigger manual updates across several systems.

Tank terminals are complex by design. They manage different products, transport modes, customers, regulatory duties, and safety-critical activities. Many facilities also depend on infrastructure that has evolved over decades and must remain available during any modernisation programme.

The pressure on this operating model is growing. Conventional fuels increasingly share infrastructure with biofuels, synthetic fuels, and other emerging energy carriers. Reporting and traceability demands continue to rise. Cybersecurity now affects operational planning, not only IT policy. At the same time, customers expect faster updates, greater transparency, and reliable information about stock and product movements. The task is clear: protect today's

operation while keeping tomorrow's options open.

When isolated automation reaches its limits

Terminals have invested heavily in digitalisation and automation. Loading systems, field equipment, planning tools, inventory applications, and reporting solutions often perform well within their defined areas.

Specialist applications can optimise individual processes, such as truck loading or inspection management. Problems arise when those processes do not share the same operational context.

A product change may require updates across several applications. Teams may enter the same information more than once. Spreadsheets and local workarounds often bridge gaps between systems. Small changes can then demand significant coordination.

These hidden dependencies make performance harder to scale across shifts, sites, and business units. They also make future changes slower, riskier, and more expensive. Adding another standalone application rarely resolves the underlying issue. Terminals need a common operating model that connects individual processes from end to end.

Process clarity and connected data

A useful digital model starts with the process, not the software. Operators need to understand the full flow from

nomination and planning to arrival, checks, execution, stock updates, documents, and reporting. They also need to see where decisions occur, where information changes hands, and where exceptions appear.

Terminals do not need to operate in exactly the same way. Local equipment, customer contracts, and regulatory rules will continue to shape operations. However, core process principles and data structures can remain consistent.

Clear responsibilities reduce ambiguity. Shared data improves traceability. Documented exceptions make decisions easier to repeat. A common process language also helps teams work across sites and functions.

This foundation is also essential for artificial intelligence. AI cannot create reliable operational insight from fragmented data. It needs context that connects orders, products, stock, assets, movements, constraints, and current operating conditions.

Connecting IT and OT without losing operational speed

Cloud technology can support scalability, security, and access to new capabilities. However, cloud deployment alone does not create an integrated terminal.

The real value comes from IT/OT convergence. Time-critical control and safety functions must remain close to the operational equipment. Loading control, interlocks, and immediate

equipment responses cannot depend on unnecessary communication delays.

At the same time, planning, customer service, inventory management, reporting, and external partners need access to current operational information. These functions should not rely on telephone calls, spreadsheets, or delayed manual updates.

A connected software layer bridges these requirements. It exchanges relevant information between business processes and operational systems in real time while leaving time-critical control within the appropriate OT environment.

This gives teams better information at the point of action. It also enables terminal customers to receive more timely and reliable updates about orders, movements, and stock.

An independent operating layer

OpenTAS 365 provides this shared operating layer for planning, execution, and operational data.

The platform supports end-to-end terminal processes and connects business applications, automation environments, field-level systems, and external partners. Open interfaces allow operators to retain proven technology while reducing dependence on individual hardware or control-system choices. This separation matters because terminal infrastructure is built for decades. The

software architecture must therefore support technologies that may not yet exist.

A flexible, independent software layer makes this possible by allowing operators to retain established assets while adding new equipment, robotics, digital twins, analytics, or AI-supported services over time.

A shared data model keeps planning, execution, inventory, and reporting aligned. OpenTAS 365 provides the operational context across the underlying systems rather than focusing on one isolated workflow or transport mode.

Terminals can adopt this model in stages. One operator may begin with nomination handling or stock visibility. Another may focus on automation integration, reporting, or yard activities. The same platform can expand as requirements and digital maturity develop.

This makes the software layer a strategic investment, not simply another application.

A secure foundation for long-term change

Long-term flexibility also depends on a maintained and secure technology stack. OpenTAS 365 uses Microsoft-based cloud infrastructure with role-based access, controlled updates, and automated backups. Clear interface governance and traceable data flows support secure operation across

connected IT and OT environments.

Cybersecurity cannot be added after the architecture has been built. It must form part of the platform, its update model, and the way systems exchange information.

Operators also need control over their data, permissions, interfaces, and future technology choices. This reduces long-term dependency and keeps the technology roadmap manageable across different infrastructure life cycles.

"Terminal transformation should not put operational continuity at risk. The right software layer connects proven systems while giving operators room to introduce new products, processes, and technologies."

- Monica Hildinger, Co-CEO, OpenTAS

From connected operations to better decisions

Once processes, data, and responsibilities are aligned, terminals can introduce more advanced decision support.

Systems can identify inconsistencies, highlight bottlenecks, and suggest actions based on current operating conditions. Employees can focus on supervision, exception handling, and decisions that require operational judgement.

Human oversight remains essential. Teams define the rules, review exceptions, and retain authority over safety-critical decisions.

Supervised autonomy is therefore not the starting point. It is the result of clear processes, integrated data, and controlled IT/OT convergence.

A fully autonomous terminal remains a longer-term vision. The immediate priority is more practical: identify hidden dependencies, connect the relevant systems, and create a software architecture that can adapt over time.

Terminal operators should ask whether their current environment can integrate new equipment, applications, and data sources without creating another

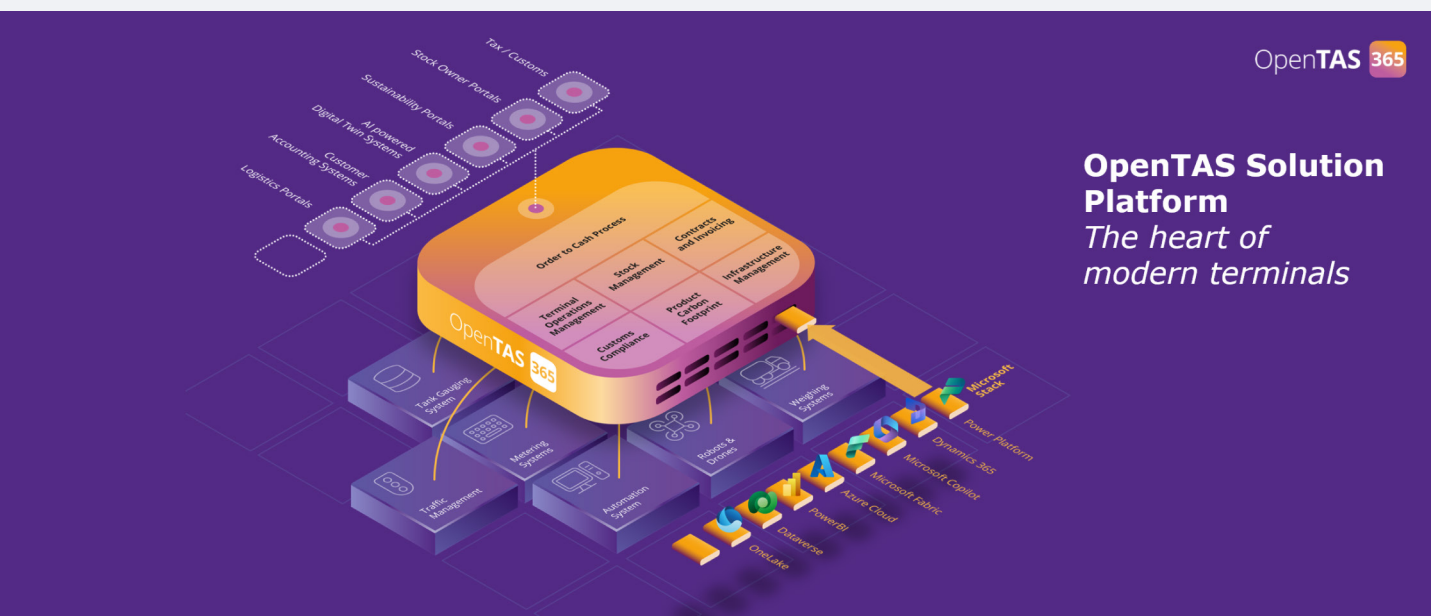
silo. An IT/OT readiness assessment can provide a clear starting point and define a staged path towards a more connected, secure, and future-ready operation.

OpenTAS works with terminal operators to assess this starting point and develop a practical transformation roadmap.

Author

Monica Hildinger is Co-CEO of OpenTAS. She focuses on product strategy, digital operating models, and the development of resilient terminal operations.

For more information, visit www.opentas.com



OpenTAS 365

OpenTAS Solution Platform
The heart of modern terminals

UM head office holds latest Green Day

Colleagues at UM Group's head office in London took part in the company's latest Green Day.

The morning started with a presentation by UM administrator Louisa Brown covering four areas – recycling in the business, improvements on energy in the office, e-waste and how it impacts the environment and an update on the flourishing green space at UM's Portbury terminal.

Louisa began by giving an overview of The Separation of Waste (England) Regulations 2025, which came into force in March last year. The legislation requires all organisations with 10 or more full-time employees to separate their recycling and food waste from their general waste.

In addition to encouraging a greater understanding of how all colleagues can help with recycling, UM Group also has an ESG committee to tackle the issues and challenges that come with trying to achieve the Government's ambition for Net Zero. Louisa explained how recycling is a simple but powerful action with wide-reaching benefits that all colleagues can contribute to whether at head office or at terminal sites.

One exciting initiative to reduce energy usage in the London office is the recent installation of a zip tap, moving away from the use of free-standing water coolers. This has resulted in an immediate reduction in energy usage by saving plastic, electricity

and petrol on vehicle delivery. The initiative will save an average of 2.4 tonnes of CO₂ emissions per year and, as Louisa explained, the saving is the equivalent of 15 flights between London City Airport and Belfast City Airport.

The presentation went on to cover the topic of e-waste and the impact each colleague can have by regularly emptying their email inboxes and reducing the volume of emails sent, in particular those with large files. An average year of emailing daily is equivalent to driving a petrol car 200 miles.

Louisa finished the presentation by updating colleagues on the success of the garden at the company's Portbury terminal, showing the ongoing transformation of the half-acre green space, sharing photos contrasting the garden's appearance in Spring with recent images taken in Summer.

Thanks to the support of the Woodland Trust, UM has planted hundreds of trees and plants including Spanish Broom, Common Dogwood, European Mountain Ash, Common Hawthorn, Sea-buckthorn and Wild Cowslip flowers.

Meanwhile, the Richard Davis Memorial Pond, named in memory of the former Portbury site controller who died last year and was responsible for planting the cherry trees 30 years ago, is also going from strength to strength, as is a vegetable

plot, tended by colleague David Richards, which includes strawberry plants, onions, lettuce, tomatoes and chilli peppers.

Following the morning presentation, several colleagues visited nearby Borough Market where there was an opportunity to stop off at Raya, a South-East Asian grocery store which prides itself on sourcing all of the products it sells with care.

Of particular interest to the team was the sugar cane, which UM trades, and which colleagues enjoyed watching being juiced before trying this delicious drink. They made a point of bringing some of the drinks back to the office for other colleagues to try.

Louisa said: "It was a fun way to end the morning session. The aim of the presentation was to celebrate some of the good things we are doing to enhance our recycling and energy usage processes and remind colleagues that everyone can do their bit by sticking to some good habits. We plan to run further Green Days around our UK sites and at our London office."



RETHINKING THERMAL INSULATION: A SMARTER APPROACH TO MOISTURE CONTROL AND CUI PREVENTION

By addressing both thermal performance and the risks associated with moisture ingress, modern TIC technologies offer a practical route to improved operational reliability and reduced lifecycle costs.

**SHERWIN
WILLIAMS®**



A

s energy costs continue to rise and efficiency targets become increasingly demanding, optimising thermal insulation has become a critical operational priority. Operators across the oil and gas, petrochemical and chemical processing industries typically need to keep storage tanks and process vessels within specific temperature ranges to preserve product quality and optimise efficiency. Traditionally, this has involved encasing temperature-controlled assets in mineral-based materials which are then protected with an outer layer of protective cladding, with expensive gas heating used to compensate for energy loss and return product to the desired temperature.

Historically, the inefficiencies associated with traditional insulation systems were often tolerated because energy and maintenance costs remained relatively low. However, rising energy prices, labour costs and increasing pressure to improve operational efficiency have made these shortcomings significantly more expensive.

Moisture Ingress - The Hidden Problem

A significant and often-overlooked part of the problem is water. Moisture can breach the protective cladding of traditional insulation systems within only a few weeks of installation. Often this happens because of precipitation leaking through gaps or damaged areas of cladding, or through condensation formed by thermal cycling. Once moisture penetrates the insulation system, it can become trapped within the insulation layer, significantly and permanently reducing thermal performance. While dry mineral wool can deliver thermal efficiency of around 95%, a moisture content of just 6.5% can reduce performance to as little as 55%. This causes temperature fluctuations, particularly during the colder, wetter months of the year.

This moisture also poses a second, even greater threat - Corrosion Under Insulation (CUI). The moisture in the insulation reaches the asset's steel surface, where it combines with oxygen, salts and other electrolytes to cause corrosion. Often referred to as a 'silent threat', CUI gradually undermines asset integrity over time and can often go unnoticed for years. Because CUI occurs beneath insulation and cladding, early identification is difficult. Inspection and monitoring are costly and labour-intensive and requires either invasive visual inspection methods, such as removing areas of cladding and insulation, or less invasive but still

expensive methods using radiography and ultrasound equipment. All too often CUI is identified too late, by which point it has caused major asset damage that requires extensive repair.

During a Sherwin-Williams field evaluation, sections of in-service mineral-based insulation were removed from a storage tank roof and found to contain between 17% and 70% water by volume. Such moisture levels can significantly increase the likelihood of CUI developing beneath the insulation system and negatively impact the thermal efficiency of the insulation.

CUI Coatings – The Story So Far

To mitigate the impact of CUI, Sherwin-Williams has already developed an award-winning range of Heat-Flex CUI mitigation primers, designed to form a protective layer underneath traditional mineral-based insulation that protects against CUI. However, the issue of diminished thermal performance due to moisture ingress has remained, until now.

Less Moisture Retention – Superior Thermal Management

Replacing traditional insulation with a Thermal Insulative Coating (TIC) offers significant benefits for operators and applicators alike. The latest generation TICs can offer consistent and predictable temperature control with long-term performance that rivals the effectiveness of traditional mineral-based insulation. These coatings help operators take back control

of their energy consumption and maintenance costs. While mineral-based materials with moisture content experience a permanent, significant decrease in thermal insulative performance, TICs offer significantly less variation in thermal performance during wetter and colder months. Data from trials in the United States has shown a 20% reduction in a vessel's gas usage during the winter months. Additionally, with TICs, thermal performance remains steady for the life of the coating, meaning thermal management is more predictable and heat top-ups are required less frequently. Because TICs remove the moisture-retaining insulation layer where CUI typically develops, the conditions required for corrosion under insulation are effectively eliminated.

TICs are also low maintenance and easy to inspect, in line with other industrial coatings. Labour savings compound across the installation, inspection and maintenance stages of the TIC's lifecycle, offering a cost competitive solution compared to traditional insulation methods.

TIC Application – Now Easier Than Ever

TICs are also considerably faster, easier and safer to install than traditional insulation systems. TICs can typically be spray-applied from a safe working distance, and in many cases, assets can remain operational during application. Once installed, TICs also provide an effective safety

barrier for employees working in close proximity to hot assets, significantly reducing the risk of contact burns. Historically, many TIC technologies have required two- or three-component formulations that must be mixed on site, increasing application complexity and material waste, while increasing the risk of formulation errors. Sherwin-Williams Heat-Flex® AEB addresses this challenge through a single-component formulation that is ready to use after mixing, helping simplify application and material management. This offers the additional benefit that unused material does not need to be discarded and can be resealed for later use. As operators continue to seek ways to improve energy efficiency, reduce maintenance costs and extend asset life, thermal insulative coatings are emerging as a compelling alternative to conventional insulation systems. By addressing both thermal performance and the risks associated with moisture ingress, modern TIC technologies offer a practical route to improved operational reliability and reduced lifecycle costs. Products such as Heat-Flex® AEB demonstrate how the latest generation of TIC technology can help operators improve thermal efficiency, simplify maintenance and address long-standing challenges associated with moisture ingress and CUI.

Author

Matthew Berry
Marketing Communication Manager – Energy, Sherwin-Williams

ONE VESSEL VISIT, ONE SHARED WORKSPACE: REMOVING COORDINATION FRICTION AT TERMINALS

When a vessel visit lives in one shared workspace, everyone works from the same status, the same documents and the same open actions.



A vessel visit runs on timing. A single missed update, a document no one can find, a change that never reached the next shift: each one can delay a berth, trigger extra costs and put pressure on people who are already working against the clock.

And yet at many terminals the coordination of that visit still lives in several places at once. One update arrives by email. A document sits in a folder. A checklist is printed. A change is discussed by phone. A note is passed between colleagues during a shift handover. Each step may be clear to the person handling it, but the overall status of the visit is not.

That is where coordination friction begins. And in an operation where safety, efficiency and reliability all depend on timing, that friction is rarely just an inconvenience. It costs time, money and control, exactly when a terminal can least afford to lose them.

The good news is that this is a solvable problem. When a vessel visit lives in one shared workspace, the picture changes: everyone works from the

same status, the same documents and the same open actions.

Fragmented emails create fragmented operations

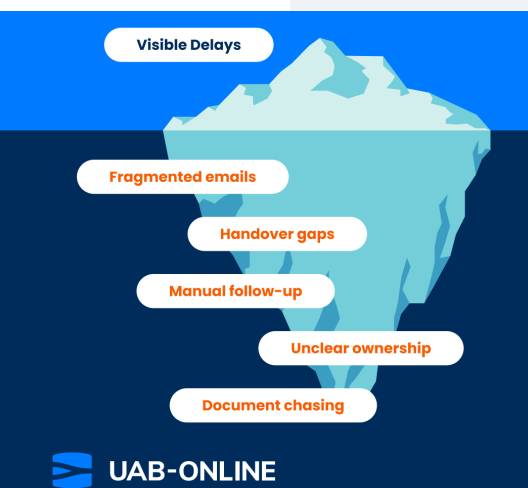
Email is useful for communication, but it is not a reliable place to manage an operational workflow. A vessel visit can involve the terminal, agent, surveyor, trader, shipping company and vessel itself. Each stakeholder may send attachments, ask questions, confirm changes or forward updates. Over time, the visit becomes a chain of messages rather than a single controlled process.

The practical problems are familiar:

- Which email contains the latest document?
- Was the update sent to everyone who needs it?
- Was the vessel already answered this question?
- Which actions are still open?
- What changed since the previous shift?
- Who owns the next step?

When the answer is hidden somewhere in an inbox, coordination becomes manual.

Operators have to search through messages, forward updates, check details, repeat information and explain decisions that should already be visible. If the context is not captured in one place, the next shift has to spend time finding out what happened, what changed and what still needs attention.



The search for information slows the handover

Shift handovers depend on context. A good handover should make it clear what has been completed, what is still open, what changed and what needs attention next.

That is difficult when the vessel visit is spread across emails, paper notes, scanned documents and individual memory. The next shift may know that a vessel is alongside or expected, but still need to search for the latest status, agreed changes or reviewed documents.

Even experienced teams lose time when they have to reconstruct the picture.

A shared workspace changes the handover. Instead of passing information verbally and hoping nothing is missed, the terminal operator can work from the same operational view. The next stakeholder can see the current status of the vessel visit, the latest documents, open actions, completed checks and recent changes in one place.

That makes handovers simpler, faster and more reliable.

One single source of truth

A single source of truth gives every stakeholder one reliable place to work from. For a vessel visit, this means that key information, documents, tasks, approvals and status updates are connected to the vessel visit itself.

Instead of asking "where is the latest version?" or "has this already been checked?", teams can see the answer in the workflow.

This does not remove the need for communication. It improves it.

Stakeholders still need to speak, clarify and make decisions. But those decisions no longer disappear into separate email threads or handwritten notes. They become part of the vessel visit file. Everyone works from the same platform, with a clearer view of what has happened and what still needs to happen.

That is especially valuable when multiple stakeholders are involved. Surveyors, agents, vessels, traders and shipping companies know where to find the latest information, while the terminal receives fewer repeated questions.

One platform for collaboration

A vessel visit is a shared process. It should not depend on each stakeholder maintaining their own version of the truth.

Working from one platform gives the visit a clear operational home.

The terminal can manage tasks, documents, communication and status in one place, while external stakeholders access the information relevant to their role. Updates, documents and responsibilities become easier to track.

The value is practical:

- fewer fragmented email threads
- less time searching for documents
- clearer ownership of open actions
- easier shift handovers
- better visibility for all stakeholders
- a stronger record of what was agreed

This is not digitalisation for its own sake. It is a way to reduce the everyday friction that builds up when people coordinate complex work through disconnected tools.

A practical next step

For many terminals, the starting point is not a large transformation programme. It is a simple question: Where does the vessel visit live?

If the answer is "in several inboxes, a shared folder, paper forms and people's heads", there is an opportunity to improve.

Bringing the vessel visit into one shared workspace gives teams a clearer way to coordinate from first update to final sign-off. It reduces fragmented emails, creates one source of truth, simplifies handovers and gives every stakeholder one central place to work from. In an industry where safety, efficiency and reliability depend on coordination, that matters.

For more information, visit www.uab-online.com

HAZARDOUS AREA CLASSIFICATION IS NOT ENOUGH: TAKING A HOLISTIC APPROACH TO DSEAR

At RAS, we work closely with clients across the tank storage, energy and chemical sectors to develop pragmatic, proportionate solutions that reflect their specific hazards and operational challenges.



Safe | Smart | Sustainable



The UK's tank storage sector plays a critical role in handling and storing flammable liquids, combustible products and other dangerous substances. From fuel terminals and chemical storage facilities to biofuels, SAF and emerging energy carriers, operators face increasing pressure to demonstrate safe, compliant and resilient operations.

When discussing compliance with the Dangerous Substances and Explosive Atmospheres Regulations 2002 (DSEAR), many organisations immediately think of hazardous area classification (HAC) drawings. While hazardous area classification remains a fundamental requirement, it is only one component of a much broader regulatory framework. True DSEAR compliance requires operators to understand risks, implement appropriate safeguards and demonstrate that dangerous substances are being managed throughout the facility lifecycle.

Too often, DSEAR compliance is treated as a standalone exercise that's completed once and then filed away.

In reality, DSEAR compliance should be considered a living process that evolves alongside a site's operations, equipment, inventory and workforce.

The role of hazardous area classification

Hazardous area classification is often one of the most visible outputs of a DSEAR assessment. It identifies areas where an explosive atmosphere may occur and classifies them into zones based on the frequency and duration of the hazard. This classification then informs equipment selection, inspection regimes and maintenance requirements.

Within a tank storage environment, hazardous zones can arise around:

- Storage tanks and vents
- Tank truck and rail loading operations
- Pumping and transfer systems
- Vapour recovery equipment
- Drum and IBC filling facilities
- Sampling and maintenance locations

These drawings provide an essential foundation for identifying risks associated with the handling of dangerous substances, but they do not, on their own, demonstrate compliance with DSEAR.

Building a defensible compliance demonstration

A comprehensive DSEAR compliance demonstration that fulfils all regulatory requirements would typically include:

- Hazardous area classification

drawings and schedule (regulation 7)

- DSEAR risk assessment and based upon this, a demonstration that risks have been reduced 'so far as is reasonably practicable' (regulation 5 and 6)
- Emergency response arrangements (regulation 8)
- Training and competency records (regulation 9)
- Relevant operating procedures and safety management systems (regulation 9)

Viewed collectively, these documents provide evidence that dangerous substances are being managed appropriately and demonstrate to regulators that risks have been reduced so far as is reasonably practicable.

Many operators already possess the necessary building blocks. The real challenge is bringing them together into a structured, auditable demonstration of compliance.

Understanding the actual risk

A common misconception is that DSEAR focuses solely on determining where a flammable atmosphere might exist. In reality, the regulations require operators to undertake a suitable and sufficient risk assessment that considers both the likelihood of an incident occurring and the consequences should one arise.

For bulk storage facilities, this means understanding:

- The hazardous properties of stored products
- Inventory quantities and storage arrangements
- Potential release scenarios
- Operational activities such as loading, unloading and maintenance
- Sources of ignition
- The potential impact on personnel, neighbouring facilities and the wider environment

The complexity of modern storage terminals often means that risks extend well beyond the areas shown on HAC drawings. Human factors, maintenance activities, simultaneous operations and abnormal operating conditions can all introduce risks that require consideration.

Demonstrating risk reduction

DSEAR requires employers to eliminate or reduce risks so far as is reasonably practicable. This involves demonstrating that appropriate prevention and mitigation measures have been implemented.

For tank farms, these measures may include:

- Overfill prevention systems
- Tank gauging and high-level alarms
- Vapour recovery systems
- Bonding and grounding arrangements
- Leak detection systems
- Ignition controls
- Inspection, testing and maintenance programmes

- Operational controls and permit-to-work systems

Importantly, compliance is not simply a matter of installing protection systems. Operators must be able to demonstrate why controls have been selected, how they are maintained and whether they remain effective throughout the life of the facility.

As storage terminals diversify into alternative fuels and lower-carbon products, the suitability of existing safeguards should also be reviewed. Products may possess different physical properties, ignition characteristics or storage requirements compared to traditional hydrocarbons.

Emergency preparedness matters

Even with robust preventative measures in place, DSEAR recognises that incidents can still occur. Effective emergency planning therefore forms a critical part of compliance.

For bulk storage facilities, emergency arrangements should address scenarios such as:

- Tank overfill events
- Vapour cloud releases
- Pool fires
- Escalation between storage tanks and neighbouring installations

Emergency plans should clearly define responsibilities, communication routes, evacuation arrangements and emergency resources. Operators should also ensure that plans are regularly reviewed, exercised and

updated to reflect changes within the facility. The effectiveness of these arrangements is often what determines how successfully an incident is managed when abnormal situations occur.

People are a critical control measure

One of the most overlooked aspects of DSEAR compliance is effective communication of risk, ensuring that those responsible for managing hazards understand both the risks present and the importance of the controls in place.

Training should extend beyond basic awareness and provide employees, contractors and visiting personnel with an understanding of:

- Product-specific hazards
- The risks identified and the locations where they may be encountered on site
- The critical control measures used to manage those risks,

including the control of ignition sources

- Emergency procedures
- Safety management systems, including procedures for high-risk operations and permit-to-work arrangements

A well-designed control system can only be effective if the people operating it understand its purpose and limitations.

Moving beyond the drawings

Hazardous area classification drawings remain an essential component of DSEAR compliance and provide the starting point for understanding risks within a tank storage facility. However, they are only one piece of the compliance picture.

For operators across the tank storage sector, compliance is ultimately about demonstrating a systematic approach to identifying hazards, controlling

risks, preparing for emergencies and ensuring that personnel understand their role in maintaining safe operations. The question should not be whether hazardous area drawings exist, but whether the facility can demonstrate that dangerous substances are being effectively managed, and that risks have been reduced so far as is reasonably practicable, throughout the operation.

At RAS, we work closely with clients across the tank storage, energy and chemical sectors to develop pragmatic, proportionate solutions that reflect their specific hazards and operational challenges. Whether supporting hazardous area classification studies, DSEAR risk assessments or broader compliance demonstrations, our goal is to help operators achieve a robust and defensible approach to regulatory compliance.

To find out more, visit www.ras.ltd.uk



FROM CLIMATE RISK TO ACTION: A PRACTICAL FRAMEWORK FOR MANAGING NATECH HAZARDS

C

Climate risk is no longer a future problem

For decades, tank storage facilities have been designed using historic climate data. Flood levels, wind loading, drainage capacity and temperature ranges have traditionally been based on weather patterns that engineers could reasonably expect to remain relatively stable throughout an asset's life. That assumption no longer holds true.

Across the UK, operators are already experiencing more frequent flooding, higher summer temperatures, more

intense storms and increasingly unpredictable weather patterns.

These changes are beginning to affect the integrity of critical infrastructure, emergency response arrangements and, ultimately, major accident risk.

For COMAH operators, climate change is not simply an environmental issue. It is becoming a process safety issue.

Natural Hazard Triggered Technological Accidents (NaTech) occur when natural events initiate or worsen industrial accidents. Floodwater may disable pumps or

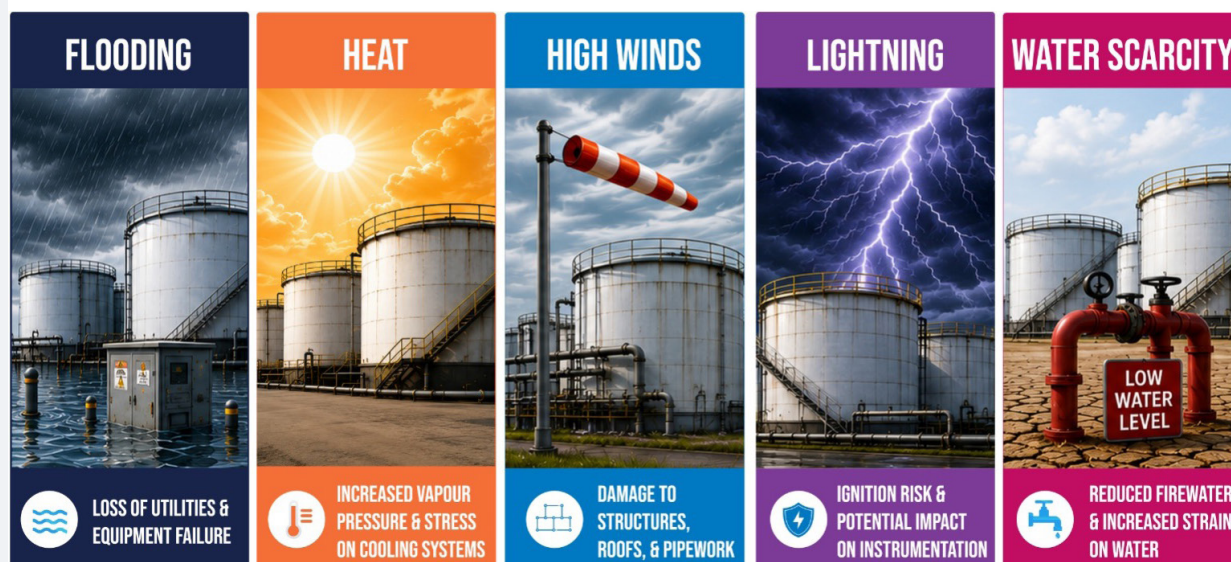
electrical systems. Heatwaves may reduce cooling efficiency and increase vapour pressures. High winds may damage structures or interrupt utilities. Severe weather can also restrict emergency response exactly when it is needed most.

The challenge is not simply identifying these hazards. The challenge is integrating climate adaptation into existing Safety Management Systems in a structured, proportionate and auditable manner.

Rather than treating climate change as a separate environmental exercise, leading operators are beginning to embed climate resilience into the same risk management processes already used for major accident hazards.

That shift represents one of the most significant developments in COMAH management for many years.

Climate-related hazards affecting tank storage



A practical framework for climate adaptation

One of the challenges facing operators is knowing where to begin.

Many organisations have undertaken climate risk assessments, but fewer have translated those assessments into practical engineering and operational improvements.

The emerging CDOIF guidance provides a logical route through this process by integrating climate adaptation into existing COMAH management systems rather than creating a separate workstream.

Instead of asking operators to reinvent their management systems, the framework builds on familiar principles of hazard identification, risk assessment, ALARP demonstration and continual improvement.

The process can be simplified into five practical stages (see 'The Five-Step Climate Adaptation Framework' below).

Step 1 – Understanding where your site is vulnerable

Every tank storage terminal has a unique combination of hazards, infrastructure and surrounding environmental conditions.

The first stage is identifying how changing climate conditions could affect the site's ability to prevent or mitigate a major accident.

For many operators this means looking beyond obvious flood risk.

Questions include:

- Could higher temperatures affect stored products or cooling systems?
- Could prolonged drought reduce

available firewater?

- Could increasing storm intensity damage pipe bridges, loading gantries or electrical infrastructure?
- Could flooding restrict emergency access routes?
- Could simultaneous failures disable multiple safety systems?

Equally important is understanding how risks will change over the lifetime of the asset.

Infrastructure expected to remain operational until 2050 or beyond may experience climatic conditions significantly different from those considered during original design.

This represents a shift from assessing historical weather events to assessing future operating environments.

THE FIVE-STEP CLIMATE ADAPTATION FRAMEWORK

AN ITERATIVE APPROACH TO BUILDING CLIMATE RESILIENCE



Step 2 – Turning climate hazards into process safety risks

Identifying hazards is only the beginning.

Operators must then understand how those hazards interact with existing process safety barriers.

Floodwater may not directly cause a major accident, but it may disable pumps, electrical equipment or instrumentation that form part of the site's protection systems.

Similarly, heatwaves may increase equipment loading, accelerate material degradation or reduce the effectiveness of cooling systems.

The objective is to understand not only what might fail, but how multiple failures could combine during an extreme weather event.

This is particularly important where climate hazards could create common cause failures affecting several independent protection layers simultaneously.

By integrating climate scenarios into existing HAZID, HAZOP and major accident hazard reviews, operators can identify vulnerabilities before they become operational problems.

Step 3 – Prioritising adaptation measures

Not every climate risk requires immediate investment.

Some improvements can be implemented quickly through procedural changes, inspection regimes or emergency planning.

Others may naturally align with future capital projects.

The objective is to identify measures that remain proportionate while maintaining major accident risk ALARP.

Examples may include:

- improving drainage
- increasing flood resilience
- reviewing firewater storage
- strengthening emergency response arrangements
- relocating vulnerable electrical equipment
- improving backup power arrangements
- reviewing containment strategies

Importantly, climate adaptation should become part of routine asset management rather than a standalone programme.

When planned correctly, many adaptation measures can be delivered alongside scheduled maintenance or replacement programmes, significantly reducing overall cost.

Climate adaptation is becoming standard practice

Climate adaptation is steadily moving from emerging good practice towards regulatory expectation.

For operators, this should not be viewed purely as another compliance obligation.

The organisations that begin adapting now are likely to benefit from improved operational resilience, stronger business continuity and better-informed investment decisions.

More importantly, they will reduce the

likelihood that future climate conditions compromise the effectiveness of their major accident prevention measures.

Climate change introduces uncertainty.

A structured management framework provides a practical method for managing that uncertainty.

For tank storage operators, the question is no longer whether climate adaptation should be considered. It is how systematically it can be integrated into everyday process safety management.

For more information, please visit www.arthian.com

Write to: hello@arthian.com





The voice of the bulk storage and energy infrastructure sector



CONTACT US



Tank Storage Association
Devonshire Business Centre
Works Road
Letchworth Garden City
Herts. SG6 1GJ
United Kingdom

www.tankstorage.org.uk



T. +44 (0)1462 488232



info@tankstorage.org.uk

Follow us

