



INSIGHT



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

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STRONG TRACK RECORD HELPS WRITE NEW CHAPTER AT GRAIN LNG

The quarterly magazine from the Tank Storage Association

Also in this issue, we explore digitalisation for industrial plants, skills and training, and the many projects and innovations that are taking place within the bulk storage and energy infrastructure sector.



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

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Peter Davidson
Chief Executive, TSA

Welcome to the winter issue of Insight. The UK government has published its modern industrial strategy, Invest 2035, for public consultation. The strategy sets out a 10-year plan to drive economic growth, innovation, and global competitiveness. It also aims to position the UK at the forefront of emerging industries, boost productivity, and ensure that the UK adapts to global challenges. The bulk storage and energy infrastructure sector plays a vital role in providing products and services that are critical to consumers and is investing, innovating, and leading the way to open up new possibilities and take full advantage of the wealth of opportunities ahead. In this issue of Insight, we explore latest projects and innovations that are taking place within our sector and continue to shine a light on training and skills. I hope you enjoy this new edition of the magazine.

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STRONG TRACK RECORD HELPS WRITE NEW CHAPTER AT GRAIN LNG

Staying ahead of the market is something the Grain team take pride in. Drawing upon a deep understanding of the industry, building the future business is a constant focus.

GrainLNG



T

he recent announcement by National Grid of its intention to sell Grain

LNG has created an opportunity to reappraise the business as it looks to the future. By any standard, the track record of growth and return on investment at the 600-acre North Kent site is a remarkable one. Now Europe's largest LNG importation terminal, and 12th largest in the world, its remarkable expansion has taken it from a small scale 'peak-shave' facility to the cutting-edge upper-tier CoMAH site of today.

A gateway for global LNG to the European energy market, the terminal comprises two 4km cryogenic lines and two jetties, able to berth two vessels simultaneously, including the world's largest, 'Q-Max'. Its eight storage tanks and extensive processing plant have a collective 1,000,000m³ capacity - equivalent to 25% of UK gas demand. It can also export, with road tanker loading and ship reloading capabilities. To put Grain's capacity in context, after its latest expansion it will be able to supply over 800GWh a day (the

whole of the UK's electricity network currently delivers 1,000GWh a day.) It's a hugely important asset to have ready on demand. Replacing it with solar energy would mean covering an area equivalent to the inside of the M25 with panels or building an additional 35,750 wind turbines.

The investment needed to create this critically important national infrastructure has been hard-won - especially set in the context of the net zero drive and the challenge of making the case for fossil fuel development. Yet the site successfully secured over £1.1bn over the three expansion phases between 2005-15 - how? The answer partly, has been the ability to consistently make the strategic case for growth, often in the face of scepticism. And also, by recognising and creating opportunities that have consistently delivered good return on investment. This is all backed by the ability to reliably deliver large-scale capital infrastructure projects - all helping build a level of trust that positions it well for raising further capital.

The management team at the site takes its commitment to the UK's energy infrastructure personally based on a firm belief in the long-term strategic need for LNG and in large-scale UK energy storage. But making the case for scarce resources is not easy, and the team are under no illusion it is the commercial returns it consistently delivers that provide the primary incentive for further

investment. However, that's not the whole story - seizing opportunities to create future value is also key. For instance, the terminal's innovative heat pipe using wastewater heat from a local power station to re-gassify LNG. Not only has this improved business margins, it has also strengthened the sustainability credentials of the site, with the reduced emissions from its use recently calculated at 230,678 tonnes over four years - equivalent to taking 88,000 cars off the road.

It's the careful calibration of commercials and long-term strategic positioning that has powered the steep growth trajectory at Grain LNG. And the critical importance of that growth has been underscored recently by the Ukraine conflict and the vital role Grain and LNG has played in the UK's (and Europe's) Security of Energy supply. Indeed, the growth seems even more remarkable given what many argue is the historic underinvestment in energy storage. For context, storage across Europe is equivalent to 80 - 100 days of energy use, Japan 40 - 60, but in the UK, it is just 14 - 18 days. But it's not just security of supply that has benefitted from far-sighted investment, it is also the role large scale availability of LNG also plays in the energy transition. With the new UK government doubling down on ambitious net zero targets, LNG's role in balancing renewable energy intermittency has never been more important.

The case for growth is also easier

Grain LNG is the largest LNG importation terminal in Europe and 12th largest in the world by tank capacity with a site that spans over 600 acres in total.



'Capacity 25' - the site's most recent project to expand and enhance capacity - will increase storage to 1,200,000m³ - equivalent to one third of total UK gas demand.



to make by the site's world-class operational efficiency and customer service. Able to 'ramp up' its extensive processing plant for a maximum send-out in under two hours, the site can currently deliver 15.8mtpa / 645GWh a day (enough to power the whole of London).

Crucially, getting the 'day job' right is never taken for granted. This is also backed-up by an industry-leading safety reputation (with the terminal proud to sit on the COMAH Strategic Forum Leadership Working Group, chaired by the TSA.) It is this high level of professionalism and service that has helped gain new customers for post-2025 capacity, while also retaining existing ones in the recent 'Capacity 29' capacity auctions – helping secure ongoing operations until 2045.

Staying ahead of the market is something the Grain team take pride in. Drawing upon a deep understanding of the industry, building the future business is a

constant focus. And sometimes that takes some lateral thinking. For instance, the site has become the first port of its kind in the world to achieve MIQ certification – making it a 'UK first mover' in the verification and control of methane emissions.

At first glance, signing-up to the rigorous and demanding standard might seem like an additional business burden, but that would be short sighted. Firstly, LNG is an industry that must continually and increasingly demonstrate its meaningful commitment to net zero. But there's also a potential commercial opportunity, with Grain LNG now a more attractive place to do business by being the first to provide UK and European natural gas buyers with the additional transparency they need on emissions levels.

It's this track record that has helped build the trust needed to generate long-term investment. This includes the new £0.5bn investment in 'Capacity 25' – the site's most recent project to

expand and enhance capacity. One of the UK's largest capital infrastructure projects, when complete site capacity will stand at 1,200,000m³ – equivalent to one third of total UK gas demand.

And what of the sale, and its impact on future business planning? Well, any prospective buyer will be buying a highly successful business, one with business already secured until 2045. But they will also know that LNG, as a fossil fuel, has a limited long-term place in any net zero energy mix.

'Gas-as-molecule' however, may have long term uses, and the Grain team are alive to the strategic potential of some new growth areas including ammonia for hydrogen and carbon capture (CCUS). These new technologies help form part of a broader vision of Grain LNG as being core to an 'Energy Island' with its location, maritime expertise and excellent safety record uniquely placing it to exploit future opportunities.

Simon Culkin, Grain LNG's Managing Director says, "I believe Grain LNG's transformational growth has been achieved through our strong track record of creating and delivering value, all while supporting the strategic energy needs of the UK and beyond. Keeping ahead of the market is always a challenge, but if you've got the right people, with the right expertise, there are always opportunities to be taken. I'm genuinely excited about where our business could go next."

The careful calibration of commercials and long-term strategic positioning has powered the steep growth trajectory at Grain LNG.





British Pipeline Agency Limited officially recognised as one of the UK's Best Workplaces in Consulting and Professional Services™

On 5 September 2024, British Pipeline Agency Limited (BPA), has been officially recognised as one of the UK's Best Workplaces in Consulting and Professional Services™.

The Best Workplaces in Consulting and Professional Services™ list is created using anonymous feedback from employees working in the industry. Analysis of the sector employee survey responses found: 93% of employees at the UK's Best Workplaces for Consulting & Professional Services say "Taking everything into account, I would say this is a great place to work" compared to a UK average for sector of 69%." BPA's result reflects its employees' genuine satisfaction with the company's culture, leadership, and work environment where they feel valued, respected, and trusted - the cornerstone of delivering exceptional service to clients.

"We are so proud to be recognised as one of the UK's Best Workplaces in Consulting and Professional Services™!" says John Armstrong, Director and General Manager at BPA. "The consistent positive feedback from our employees about their experiences with colleagues, leaders, and roles is immensely meaningful. This isn't time to take our foot off the gas instead this marks a starting

point for us, using this achievement as a benchmark to further enhance our employee experience. Thank you to our employees whose honest and candid input into the survey has enabled us to earn this prestigious recognition. We will continue to invest in our team's development and well-being, knowing that their success directly contributes to the success of our clients."

Benedict Gautrey, Managing Director of Great Place To Work® UK, expressed his congratulations to BPA for attaining their Certification™: "By viewing employees as their greatest asset, leaders of these top-performing Consulting and Professional Services organisations work to ensure their projected employer image is aligned with employees' real, lived experiences of the workplace. Best Workplaces recognise the vital role reputation plays in driving overall brand and business success – understanding that people (candidates, colleagues, and customers) are a brand's most critical touchpoints. It's great to see so many examples of organisations making their workplaces truly 'great'. A huge congratulations to BPA for making it onto this list."

ACCELERATING THE HYDROGEN REVOLUTION: LEVERAGING VIRTUAL PLANTS FOR BROWNFIELD ASSETS

As the world shifts towards sustainable energy solutions, hydrogen stands out as a promising contender. While much focus is on new, greenfield projects, there's untapped potential in optimizing existing facilities.

GIZIL



As the world shifts towards sustainable energy solutions, hydrogen stands out as a promising contender. While much focus is on new, greenfield projects, there's untapped potential in optimizing existing facilities. As Gizil, our Virtual Plant solution is tailored for brownfield assets, poised to revolutionize hydrogen integration by addressing real-world challenges head-on.

Introduction

The global push for clean energy has positioned hydrogen at the forefront of future fuel solutions. Hydrogen's versatility allows it to be utilized across various sectors, from transportation to power generation. However, scaling hydrogen production and utilization isn't just about building new facilities; it's also about adapting and optimizing the vast array of existing industrial assets.

Gizil's Virtual Plant solution specializes in creating comprehensive virtual replicas of brownfield assets - facilities already in operation. Unlike generic digital twins that often

serve as buzzwords disconnected from practical applications, our Virtual Plant focuses on tangible, actionable insights. It provides a realistic, interactive environment to plan, test, and implement hydrogen technologies within existing infrastructures.

1. Retrofit and Upgrade Existing Facilities

Adapting current facilities to handle hydrogen processes is a complex endeavor. Physical modifications can be costly, time-consuming, and risky without proper planning.

Simulation of Retrofitting Processes:

The Virtual Plant allows engineers to virtually test modifications needed for hydrogen integration. This simulation identifies potential issues before they arise on-site, ensuring that plans are feasible and effective.

Cost and Time Efficiency:

By foreseeing challenges and optimizing solutions virtually, facilities can reduce downtime and save on costs associated with trial-and-error approaches.

Minimized Disruptions:

Keeping existing operations running smoothly during upgrades is crucial. The Virtual Plant helps plan interventions that cause minimal interference with current processes.

As an example, a chemical plant aiming to incorporate hydrogen as a feedstock can use our Virtual Plant

to simulate the necessary equipment upgrades. The virtual environment can highlight bottlenecks in the proposed design, allowing the team to adjust plans before any physical changes were made, saving an estimated 20% in project costs.

2. Integration with Existing Infrastructure

Integrating hydrogen into established systems is a complex task that goes beyond simple additions. It requires a deep understanding of the existing infrastructure to identify optimal tie-in points and ensure compatibility without extensive redesigns.

Comprehensive Asset Visualization:

The Virtual Plant provides a detailed, interactive 3D model of your existing facilities. This visual representation helps engineers and planners understand the physical layout, equipment specifications, and spatial constraints, which are crucial for identifying feasible tie-in points for hydrogen integration.

Accurate Documentation:

Our solution consolidates all asset data, including equipment details, piping layouts, and instrumentation, into a single platform. This ensures that all stakeholders have access to up-to-date information, reducing the risk of errors during the integration process.

Collaboration Enhancement:

The Virtual Plant enables cross-functional teams to collaborate

Gizil's Virtual Plant solution specializes in creating comprehensive virtual replicas of brownfield assets - facilities already in operation.



Adopting hydrogen technologies through the optimization of current assets not only accelerates the global energy transition but also maximizes return on existing investments.



effectively. Engineers, operators, and maintenance personnel can virtually walk through the plant, discuss potential integration strategies, and make informed decisions without the need for physical site visits.

Risk Identification:

By thoroughly understanding the existing setup, potential risks associated with integrating hydrogen - such as material incompatibility or spatial limitations - can be identified early, allowing for proactive mitigation strategies.

To give an example, an industrial facility planning to incorporate hydrogen into their process needs to find suitable tie-in points within their complex piping network. Using our Virtual Plant, the engineering team can conduct a virtual walkthrough of the facility. They are able to:

- Identify accessible locations for new piping connections without interfering with ongoing operations.
- Determine areas where existing equipment could be repurposed or would need upgrades to handle hydrogen safely.
- Share insights with the construction team to plan for minimal disruption during installation.
- This approach streamlines the planning phase, reduces the need for multiple physical inspections, and ensures a smoother integration process.

3. Regulatory Compliance and Safety

Ensuring regulatory compliance and maintaining high safety standards are critical during the operational

phase of any facility, especially when integrating hydrogen technologies into existing brownfield assets. After construction, the focus shifts to ongoing compliance, risk management, and safety assurance.

Enhanced Compliance Monitoring:

The Virtual Plant provides a comprehensive digital representation of your facility, integrating data from various sources such as equipment specifications, inspection records, and maintenance schedules. This centralized platform allows for real-time monitoring of compliance with industry regulations and standards.

Safety Audits and Inspections:

With the Virtual Plant, you can conduct virtual safety audits and inspections. It enables teams to identify potential safety hazards, non-compliant equipment, or areas requiring maintenance without the need for physical presence on-site, thus saving time and resources.

Incident Response Planning:

The Virtual Plant facilitates the development and rehearsal of emergency response plans. By simulating various scenarios within the virtual environment, teams can prepare for potential incidents involving hydrogen, ensuring swift and effective responses that minimize risks to personnel and assets.

Regulatory Reporting and Documentation:

Our solution streamlines the generation of reports required by regulatory bodies. It maintains an up-to-date digital log of inspections, maintenance activities, and compliance checks, simplifying

the reporting process and ensuring that all necessary documentation is readily available during audits.

Continuous Improvement:

By analyzing operational data within the Virtual Plant, organizations can identify trends and areas for improvement in safety practices. This proactive approach enables the implementation of corrective actions before minor issues escalate into significant problems.

Conclusion

The transition to a hydrogen-powered future doesn't solely rest on new infrastructure. By leveraging our Virtual Plant technology for brownfield assets, existing facilities can become pivotal players in the hydrogen economy. Our solution offers a comprehensive tool for retrofitting, integration, compliance, and training, addressing real-world challenges with practical, actionable strategies.

Adopting hydrogen technologies through the optimization of current assets not only accelerates the global energy transition but also maximizes return on existing investments. With our Virtual Plant, facilities are not just adapting to change - they are leading it.

Author

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UM Terminals recruits two apprentices to maintenance team

Bulk liquid storage specialist UM Terminals has recruited two apprentices as part of the expansion of its in-house maintenance team.

Paulie Twigg and Harry Cain, both 18, will undertake a four-year apprenticeship based at the company's Regent Road head office in Liverpool, but also spending time at UM's other UK terminals in Hull and Portbury.

Jake Ellis, UM Terminals' Maintenance Manager, said: "I am delighted to welcome Paulie and Harry as our first two apprentices in the maintenance department. We had considerable interest in the apprenticeship programme with 12 candidates attending final interviews. Paulie and Harry were the standout candidates from a strong field."

The apprenticeship programme is run in conjunction with Liverpool-based North West Training Council, the premier North West and Liverpool City Region Advanced Manufacturing Engineering Apprenticeship and Commercial Trainer Provider. The two apprentices will spend four days a week working at UM Terminals and one day attending college. Paulie, from Stockbridge, Liverpool, and Harry, from Bootle, Liverpool, will be supported in their development by mentors from the maintenance team at UM Terminals.

Jake added: "While the apprentices will primarily work out of our Liverpool terminals, they will also spend time

working with colleagues at our other terminals in Hull and Portbury. This is the first time we have recruited apprentices and is an important element of our strategic decision to expand our in-house maintenance capability. With other appointments in recent months it means we now have an eight-strong team including technicians, fitters and an electrical controls and instrumentation specialist giving us the capability to run an ongoing programme of maintenance across all of our assets."

UM Terminals is also creating a dedicated maintenance workshop in a former boiler house at its Regent Road terminal including a bespoke workshop, storage area and staff kitchen. This is the latest part of a multi-million pound investment in the company's Regent Road terminal, which is also home to its head office.

A number of tanks at Regent Road have been upgraded to keep up

with the demand for storage in the Liverpool area. A further enhancement has seen the introduction of dual dock loading with customers now able to load and discharge cargo at Huskisson Dock and Canada Dock, reducing delays due to congested shipping berths. The investment has supported UM Terminals' expansion into a broader range of products which now includes chemicals, industrial oils, vegetable oils, fertiliser and key growth areas of biofuels and biofuel feed stocks.

The company is also underway transferring across to low carbon tank heating technology, part of the wider UM Group's sustainability strategy. This investment includes the introduction of industrial ground and water source heat pumps to support the reduction in its carbon footprint in line with various UK and international requirements.

www.umterminals.co.uk



TRANSFORMING SAFETY IN THE OIL TANK CLEANING INDUSTRY- MITIGATING RISK AND SAFEGUARDING COMPANY VALUE

Chris Platt, Commercial Director of Re-Gen Robotics discusses why operators responsible for tank cleaning in the Oil & Gas industry should embrace the opportunities presented by the emerging technology of robotics.



Tank cleaning plays a critical role in ensuring the efficiency and safety of oil storage facilities. It represents an important step in the preparation process for risk-based inspection as a route to assuring storage tank integrity. To gain reliable information about tank wall thicknesses, corrosion rates and the confirmation of the absence of metal degradation, it is vital to have a clean surface on which to perform non-destructive testing. Hence, industry needs to be able to clean its tanks and it needs to be able to do this safely, quickly and efficiently.

Traditional practices for storage tank cleaning, such as manned confined space entries, have led to and continue to lead to, tragically avoidable fatalities and accidents. Indeed, the U.S. Bureau of Labour Statistics reports fatalities from confined space incidents occurring at a rate of 2 per week in the U.S. during the period 2011-2018. Manned entry into confined spaces containing toxic and flammable atmospheres is inherently hazardous. Accordingly, as operators strive for enhanced safety

and risk reduction, the adoption of robotic cleaning methods is becoming increasingly favoured. It reflects the drive across industry towards inherent safety, where risk is avoided rather than controlled.

This principle is explicitly endorsed by both the UK Health & Safety Executive and the U.S. Chemical Safety Board. If human operators are isolated from the hazards, risks can be reduced by orders of magnitude, or as Trevor Kletz, one of the pioneers of safety management said, "people who aren't there, can't be killed". Whilst regulators do note the desirability of inherent safety, it could be argued that they could push more strongly for the use of techniques such as robotics which have emerged over recent years and are now proven technology.

Re-Gen Robotics' robots are Zone 0 Ex-certified and are hence able to operate in tanks containing the most volatile of atmospheres. They are thus intrinsically safe as well as being inherently safe. The robot, or remotely operated vehicle (ROV) is driven by an operator based in a containerised, air-conditioned control room, usually located within the tank bund. Using forward and rearward facing lights and cameras and hydraulic control, the human component of the system is situated remotely from the hazard in accordance with sound risk management approaches. A result of this, is that risks from fatigue and human factors, both topics of

much focus in risk management discussions, are also reduced.

The team at Re-Gen Robotics has a highly specialised background in the field of oil tank cleaning and their experience encompasses all conventional tank designs. Within these tanks, a full range of oil feedstocks and products from fuel oil through to white products and crude oil can be handled. We believe that robotic cleaning is the way forward and we have invested heavily in support of that. We have, over the last two years, introduced advances in track technology where we have demonstrated the ability to operate within lined tanks without damaging the lining. We have also heavily developed our suction heads, at the 'business end' of the robot to improve sludge and liquid capture. Our suction heads can add diluent, steam or high pressure hot water as required by the characteristics of the fluid being removed from the tank. Where we use heat to reduce the viscosity of the pumped fluid, we can maintain temperature through our suction hoses and vacuum trucks.

In under five years, we have eliminated 15,000+ hours of CSE cleaning in tanks. Over 60 tanks, including cleans for a number of UK based oil majors, have been completed.

Industry players who are embracing robotic tank cleaning are also discovering advantages in terms of operational efficiency. Re-Gen

Re-Gen Robotics' technologies can perform tank cleaning tasks with increased speed, precision, and consistency compared to other approaches.



The team at Re-Gen Robotics has a highly specialised background in the field of oil tank cleaning and their experience encompasses all conventional tank designs.



Robotics' technologies can perform tank cleaning tasks with increased speed, precision, and consistency compared to other approaches. Tank downtime can be reduced by up to 40 per cent, mainly because of the short time it takes to assemble the equipment and the fact that staff are not required to enter the confined space of the tank.

By implementing robotic technologies, oil tank cleaning companies can achieve substantial cost savings. From arrival onsite, when cleaning white product tanks, the entire tank cleaning system can be set up in four hours, which is quicker than the time taken for human crews to prepare to enter a tank. The initial investment in implementing automated systems may be offset by long-term benefits, including reduced labour costs, lower insurance premiums, and minimised expenses associated with accidents, injuries, and litigation.

Additionally, the optimisation of cleaning processes through

robotic technologies can lead to efficient resource utilisation, such as decreased water and chemical usage, further contributing to cost reduction and environmental sustainability.

Government bodies worldwide have recognized the hazards associated with manual tank entry, leading to the implementation of stringent safety regulations. Companies that fail to comply with these standards face severe penalties, legal consequences, and reputational damage. Embracing robotic cleaning technologies demonstrates a commitment to safety, ensuring compliance with regulations and avoiding potential fines. This proactive approach enhances the industry's image and safeguards companies from adverse impacts on their share prices.

In today's interconnected world, reputation is everything. News of accidents, injuries, or fatalities in the oil tank cleaning industry spreads fast, leading to negative public perception of affected companies. Adverse

incidents can irreparably damage a company's reputation, undermining investor confidence and directly impacting share prices. By prioritising robotic cleaning, companies can protect their brand image, enhance stakeholder trust, and maintain a positive market valuation.

The implementation of robotics in the oil tank cleaning industry is creating a paradigm shift that is promoting safety by eliminating fatalities and accidents. Tank operating companies can not only protect human lives but also create a sustainable and profitable future for themselves. The key driver to embrace this technology is achieving far greater technical results while having fewer people risking injury or their health. In our view, it is time to prioritise safety, embrace innovation and work towards a more efficient oil tank cleaning industry.

For further information on Re-Gen Robotics service visit www.regenrobotics.com

Author

Chris Platt, Commercial Director, Re-Gen Robotics.

Re-Gen Robotics' robots are Zone 0 Ex-certified and are hence able to operate in tanks containing the most volatile of atmospheres.



When did you last review your Hazardous Area Classification?

On the 1st of October 2024, the Energy Institute published the 5th edition of their 'Model Code of Safe Practice Part 15: Area Classification for Installations Handling Flammable Liquids' (EI15). The introduction of this publication is a perfect opportunity to review your current hazardous area classification.

Under Regulation 7 of DSEAR; 'every employer shall classify places at the workplace where an explosive atmosphere may occur into hazardous or non-hazardous places [...] and shall classify those places so classified as hazardous into zones.'

Hazardous area classification is a tool to help you manage your potential ignition sources to ensure that the risk from fires and explosions is suitably understood and appropriately managed.

EI15 was last updated in 2015, and the new 2024 edition includes adjustments and refinements, that could result in changes to your hazardous areas.

EI 15 states:

Hazardous area classification should be reviewed, and if necessary, amended as part of any project or modification to either the equipment or process or,

- Where there are any significant changes to plant layout, hazardous substances or operating conditions;
- Where specific dispersion modelling is carried out for release source(s), and

- Following updates to industry guidance and standards. Hazardous area classification should be reviewed every 5 years.

Key changes in EI15 5th edition

The Energy Institute highlighted the most pressing changes made to the guidance and an overview of some of the details of these changes are listed below:

- Updated advice on mists to include information from HSE/ industry research projects e.g. tests found that diesel could only be ignited in the test rig at pressures above 5 barg, with biodiesel requiring a 20barg release.
- Extensive remodelling of all release cases in Phast v8.4 (affecting direct examples, equipment leaks and releases from vents), with all modelling reviewed by the HSE.
- Inclusion of releases of pure hydrogen in both gaseous and cryogenic liquid forms.
- Update of hazard range look up tables for higher pressure releases of substances A, B, G(i), G(ii), and LNG.
- Update of direct examples to tabular format that gives sources for hazard radii presented in direct examples. The direct examples are now easier to apply and interpret.

There is no universal trend that can be seen throughout the new data, with hazard radii for certain release cases increasing, yet decreasing for

others. This variation emphasises the importance of reviewing your hazardous areas. For those substances with a greater hazard radius than previously determined, does your site's Hazardous Area Classification need to be amended? What is the impact of any changes to your zones? Have you now got equipment outside of zones, or in a less onerous zone? This could mean you need to change equipment, improve safeguards, or it could mean that you may potentially reduce your inspection and maintenance activities.

Although EI15 is a widely recognised and accepted code of practice for undertaking HAC, there exists a wide range standards and industry specific guidance for hazardous area classification, all with the same objective of ensuring that fires and explosions are appropriately understood and protected against such that the risk is as low as practicable. Different guidance may be more applicable to different organisations and situations; therefore, we encourage you to take this opportunity to check when your hazardous area classification was last reviewed and ensure that it is up to date with the latest relevant guidance.

For more information, please visit www.ras.ltd.uk



Safe | Smart | Sustainable

THE IMPORTANT ROLE OF MOBILE DEGASSING AND REPLACEMENT SERVICES IN REDUCING INDUSTRIAL EMISSIONS

Efficient emission reduction for tank terminals, refineries, industrial services, chemical plants, the shipping sector and other markets.

ETS Degassing
MOBILE EMISSION TREATMENT

David Wendel, Managing Director
ETS Degassing GmbH



A sustainable management of emissions is becoming a core focus in many industries, as mitigating the amount of hazardous emissions and pollutants that are released into the air is a very important task. Industrial facilities in different markets need to further implement efficient, safe and environmentally conscious solutions for the reduction of emissions.

ETS Degassing offers mobile degassing solutions to customers across Europe, helping them to significantly reduce their footprint in gases with high greenhouse warming potential (GWP) factor. Our key services include tank degassing, temporary replacements for stationary emission reduction systems, ship and inland barge degassing and further technologies. These services are important for reducing the environmental footprint of sectors with substantial GHG emissions, delivering meaningful reductions in gases with high greenhouse warming potential (GWP).

Tank degassing: enhancing safety and environmental compliance

Tank degassing is a vital service for facilities storing or transporting products like crude oil, petrol or other substances that create a high amount of carbon dioxide, methane and their precursors, the volatile organic compounds (VOC). Our mobile vapor combustion units can be deployed to safely remove harmful vapors from all types of storage tanks, ensuring compliance with strict environmental and safety regulations. The degassing process minimizes the risk of dangerous gas accumulation, creating a safer environment for onsite workers and reducing the potential for leaks or explosions.

One of the most significant benefits of tank degassing is its impact on the overall GHG footprint. For example, a 1,280 m³ LNG fuel tank has a potential GWP factor of 36 kg CO₂ equivalent (CO₂eq) per kilogram, equating to a total of 60.87 tonnes CO₂eq. Using our effective technology, facilities can reduce this to 6.64 tonnes CO₂eq, achieving an impressive CO₂eq balance of -54.23 tonnes, an 89% reduction. This not only demonstrates the efficiency of the degassing process, but also highlights its potential for large-scale environmental impact.

Temporary VRU replacement: ensuring continuous emission treatment

ETS Degassing mobile vapor combustion units can also be

deployed as temporary VRU back-up, ensuring that facilities can maintain emission control even during the downtimes of their permanent VRU systems during maintenance or repair. Vapor recovery units are essential in capturing VOCs from tanks and loading operations, reducing their release into the atmosphere. When a permanent VRU needs to be shut down, our mobile incinerators take over the systems' responsibilities to continue capturing and processing vapors, maintaining emission compliance and helping facilities to avoid regulatory penalties and the shutdown of the entire facility. With our mobile units in place, facilities can uphold their environmental commitments and minimize the risk of GHG emissions, even during unplanned downtime.

Ship degassing and purging: reducing maritime emissions

For the shipping and marine industry, ship degassing and purging services play a critical role in preparing vessels for cleaning, maintenance, repair or product changes. ETS Degassing's mobile vapor combustion units destroy volatile gases from cargo holds and tanks. This service is essential not only for safety—preventing the risk of gas buildup in confined spaces—but also for reducing the amount of hazardous emissions that could otherwise be released into the atmosphere during docking. Our services can be applied for the degassing of LNG fuel tanks, during product changes, loading

and unloading procedures or in preparation of maintenance and repair works in the ship yard. In combination with our mobile vaporizer with nitrogen tank, we can also carry out inerting and purging operations.

Advanced ATEX Zone 0 technology: safer solutions for hazardous areas

Industries operating in hazardous zones require specialized equipment for emission management. ETS Degassing offers cutting-edge technology, including ATEX Zone 0 robots and blowers. These tools are specifically engineered to operate in environments with a high risk of explosion, where traditional equipment may not be suitable.

The ATEX Zone 0 robot, for example, is designed for confined spaces within tanks and pipelines, offering a safer, remote-controlled option for tank cleaning. It can be operated from a safe distance via two joysticks and a monitor. Similarly, the ATEX Zone 0 blower provides a safe solution for the extraction of gases and vapors from plants and tanks. By integrating these advanced technologies, we enable industries to carry out essential emission reduction activities even in high-risk areas, improving both safety and environmental compliance.

Purifying industrial exhaust air from pollutants

We maintain a close technological cooperation with our sister company ETS Air Systems, also a part of ETS Group. ETS Air Systems is specialized

in developing efficient solutions for the purification of industrial exhaust air. The units destroy pollutants like VOC, particles or fine dust with a decomposition rate of over 99 % and convert them into freely available heat flow, contributing to safer working conditions and a better air quality. The industrial process air purification systems are available as thermal and catalytic systems as modular concepts, capacity extensions are possible.

Conclusion

By applying emission reduction services, facilities can significantly lower their GHG footprint and reduce their amount of emitted pollutants with high CO₂eq and GWP. This offers a pathway to meet and exceed emission reduction targets. ETS Degassing's comprehensive suite of services enables industries to safely manage emissions and minimize their environmental impact. By reducing GHG footprints and controlling high-GWP gases, these solutions are a practical and impactful approach to sustainable industrial operations.

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PIPELINE PIONEER: ACHIEVING ENGINEERING TECHNICIAN STATUS THROUGH LEVEL 3 BULK STORAGE OPERATOR DIPLOMA

The Engineering Technician (EngTech) status, awarded by IChemE, is a globally recognised qualification that signifies high levels of technical competence and professionalism.



John Reynolds, Managing Director,
Reynolds Training Services



Aaron Smith is a Deputy Operations Manager for Oikos Storage and he has made history by becoming the first individual to achieve Engineering Technician (EngTech) status with the Institution of Chemical Engineers (IChemE) through the completion of the Level 3 Diploma for a Bulk Storage Operator Technician.

This groundbreaking accomplishment not only highlights the effectiveness of the Level 3 Diploma program but also signifies a major step forward for the sector's career development pathways. Aaron's achievement underscores the ongoing work being done by Reynolds Training in association with the TSA and IChemE to streamline professional qualifications, making them more relevant and accessible to the industry's workforce.

Reynolds Training's MD, John Reynolds said: "The work undertaken with IChemE is critical to the sector and wider development of structured career pathways, not just within operations, but also recognising

the wider pathways such as in mechanical, electrical, safety and management disciplines, to name but a few."

For his part, Aaron's employer, Arunan Sriskanda (MD of Oikos Storage and Vice President of the TSA) added: "I recognise the commitment anyone has to make if they are studying whilst working, it is no mean feat! This is a fantastic achievement by Aaron, to be first on the terminal would be an achievement on its own but to be the first in the country adds extra kudos to his achievement!"

A milestone in the bulk storage sector

Aaron's success is not just personal—it's a major milestone for the bulk storage sector as a whole.

As energy transition makes an ever-growing impact on our society, worldwide, the Bulk Storage and Energy Infrastructure sector will continue to be at the vanguard, developing new technologies and new working practices to navigate an ever-changing energy landscape. This is why it is essential to develop career pathways now - so we can attract the brightest and the best to our sector with the promise of a lucrative lifelong career. Only in this way will our sector compete with other sectors as we look to bridge the skills gap.

The Level 3 Diploma for a Bulk Storage Operator Technician, offered by Reynolds Training, is specifically

designed to equip learners with the technical skills and safety knowledge needed to thrive in high-hazard environments like bulk liquid storage facilities and to go on to carve out a career pathway.

Aaron is just the first to take this qualification forward by earning the professional recognition of IChemE's Engineering Technician Status. Many will, no doubt, follow.

As Aaron put it: "I am delighted to have earned my EngTech certification. It shows my employer and our clients that I've had my qualifications and my competence independently evaluated and validated. Holding EngTech status will also increase my networking chances with key people and it will offer future career opportunities."

How Reynolds Training prepared Aaron for success

The Engineering Technician (EngTech) status, awarded by IChemE, is a globally recognised qualification that signifies high levels of technical competence and professionalism. Employing individuals with EngTech status means businesses can achieve higher operational standards, particularly in sectors like ours, where safety and precision are paramount.

Steven Gasser, Associate Director, Regions at IChemE agrees: "Professional registration provides a benchmark through which the public, employers and their clients can have

confidence and trust that registered engineers and technicians have met globally recognised professional standards."

The Diploma is tailored to the unique challenges of bulk liquid storage and includes a comprehensive curriculum that covers everything from process safety to emergency response and technical operations.

Oikos' Arunan Sriskanda added; "The Diploma provides a clear pathway to knowledge, experience and capability - which are key components of our competency assurance. Having a standard for Operators across the sector will help the career progression of staff which will, in turn, help increase the standards we set within the bulk storage sector."

The collaboration behind Aaron's achievement

Aaron's accomplishment is not just the result of his own determination but also of a wider collaboration between the TSA, IChemE, and Reynolds Training, who have been working together to ensure that qualifications like the Level 3 Diploma align closely with the needs of the sector and provide clear routes for continuous professional development.

This collaboration has been particularly focused on making the EngTech qualification more accessible to operators within the bulk storage industry. By streamlining the process and integrating career

development pathways into existing training frameworks, the sector is better positioned to meet its evolving challenges, particularly in safety and operational efficiency.

The partnership between TSA, IChemE, and Reynolds Training is not only about training for today's needs but also about preparing for the future. As the bulk storage sector continues to innovate, particularly in response to energy transition and sustainability pressures, having a pipeline of skilled and qualified operators is more important than ever.

As John Reynolds puts it: "Whilst Reynolds Training and the wider sector have developed not only the apprenticeship route and associated L3 BSOT standards, our collaboration has attracted an independent body like IChemE to award it their stamp of approval. That encourages wider collaboration across the sector where learning not only evolves, but is shared."

Alongside this collaboration with IChemE, Reynolds is strengthening their drive with the TSA Skills Committee whilst, at the same time, developing alliances with SIAS - which is the End Point Assessment Organisation for the Apprenticeships Reynolds offers. SIAS has also recently become a recognised Awarding Organisation in its own right. Collaborating ever-more-closely with organisations like SIAS and the others is essential because it

not only adds value but also structure to qualification routes and career pathways.

A pathway to future success

Aaron's achievement highlights the critical role that structured qualifications play in developing the next generation of leaders in the bulk storage sector. The career pathways being built by TSA, IChemE, SIAS and Reynolds Training ensure that operators and technicians have the opportunity to advance, both technically and professionally.

For Aaron, the future looks bright: "The Level 3 Diploma and the professional recognition from IChemE have already enabled me to push my career forward by demonstrating 'I can do the job'. They also enable me to explore higher level qualifications."

Steven Gasser, of IChemE, confirmed that this is very much the point of awarding registration to those who have completed the Diploma: "It provides an opportunity for those working in bulk storage to engage

with IChemE and explore how they can become registered to further demonstrate the competence, expertise and specialism in the sector."

For his part, John Reynolds greatly values the collaboration with bodies like IChemE, TSA and SIAS as this underpins his goals to strive forward in continuous development and improvement of the career pathways - which will lead to greater career opportunities for workers and greater efficiency and flexibility for the employers.

With structured career pathways, the bulk storage sector is setting the stage for a new generation of skilled professionals. Aaron's story is just the beginning, and his success should serve as inspiration for those who follow.

As his boss, Arunan, put it: "Aaron's achievement can show others that continuous professional development is attainable within the bulk storage sector. Closer to home, I hope Aaron's

achievement inspires his fellow Oikos colleagues to adopt a similar approach."

Author

John Reynolds, Managing Director, Reynolds Training Services

About Reynolds Training Services

Reynolds Training Services creates and delivers health & safety training and process training, as well as competency management, to build future-focused career pathways for the high hazard industries, covering everything from plant, through logistics, to tank storage. Our courses are underpinned by internationally recognised awarding bodies including NEBOSH, IOSH and GQA.

As a registered Apprenticeship Training Provider, we founded the UK's first Bulk Liquid Storage Apprenticeship. We also provide bespoke training to meet the needs of our sector today and into the future of energy transition. Always keen to drive forward digital transformation in our sector, we are pioneering the use of 3D VR technology in our training delivery.

Reynolds Training's MD, John Reynolds, and Aaron Smith, Deputy Operations Manager for Oikos Storage.



Teamwork Security and Training Services Ltd Launch Drug and Alcohol Testing Service

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REVOLUTIONISING PIPELINE CLEANING: DE-INVENTORY OF AN 8.7KM UN-PIGGABLE METHANOL LINE USING ADVANCED ICE SLURRY TECHNOLOGY

Advanced Ice Cleaning (AIC™) is a technology WSG has developed, which offers a revolutionary approach to cleaning un-piggable pipelines and complex system.



WSG Energy Services is a trusted partner to the energy sector, delivering innovative, tailored solutions for pipeline maintenance, commissioning, and decommissioning globally.

Known for its expertise operating in complex environments, WSG combines advanced technology with rigorous safety standards, positioning itself as the market leader across key areas including gas infrastructure, refining, FPSO, mining, decommissioning, offshore projects, process and pipeline management.

Advanced Ice Cleaning (AIC™) is a technology WSG has developed, which offers a revolutionary approach to cleaning un-piggable pipelines and complex system (e.g. heat exchangers), designed to tackle configurations that have historically been deemed impossible to clean with traditional methods.

Benefits of Advanced Ice Cleaning

WSG's AIC™ solution is a unique approach, that utilises high-solids ice slurry - to tackle the rigorous cleaning demands of complex pipelines and systems. Ice slurry is pumped under pressure to create wall shear stress, dislodging contaminants and adhered debris within pipelines. The ice slurry flows like a liquid yet retains the abrasive nature of a solid, making it well suited to complex, multi-diameter pipe networks which conventional methods often struggle to clean. This method also distinguishes itself in sustainability; upon completing its cleaning cycle, the ice slurry melts back into its original constituents, (typically salt and water), eliminating the need for chemical agents and reducing environmental impact.

WSG's AIC™ solution offers a range of advantages, making it a powerful and efficient choice for pipeline cleaning. Requiring minimal enabling works, it can reduce the impact on concurrent operations. AIC™ can also reduce overall duration & project cost, allowing systems to be cleaned in situ, eliminating the need for mechanical intervention or subsequent leak testing. Its flexibility accommodates variable pipe sizes, enabling seamless cleaning of complex configurations, including pipelines traditionally deemed un-piggable due to challenging topologies or geometries. It effectively removes sand, wax, dust, and rust. Additional additives such as caustic soda or hydrochloric acid can also be incorporated to tackle

tougher contaminants. The process also allows for gradual entrainment of debris, reducing risks associated with blockages, as any potential restriction can simply be left to melt.

Recent Case Study – Methanol Pipeline

In a recent project, WSG delivered a 40 m³ slug of ice slurry to address the unique challenges presented by an 8.7 km, multi-diameter methanol pipeline. This operation required an advanced solution capable of handling diverse pipe diameters and layouts, that would have not been possible using conventional cleaning techniques. The application of ice slurry here not only underscored the technology's flexibility, but also expanded its envelope of operations in the pipeline industry, opening new avenues for de-inventorying challenging systems.

Steve Wheeler, WSG's AIC™ Project Lead explained, "The primary objective of this project was to ensure the safe de-inventorying of the multi-diameter methanol pipeline (ranging in sizes from 6" to 24"), removing the potential for environmental harm from leaks and enabling a reduction in its hazard classification from high to low. This transition would ease the regulatory and administrative requirements typically associated with high-hazard pipelines, allowing for its future decommissioning and removal."

"A significant secondary aim was the

recovery of the high-purity methanol contained within the pipeline."

At the time of the project, the methanol, amounting to approximately 970 m³, was valued at around \$600,000 USD. So, reclaiming as much medical grade methanol, (99.9% pure), as possible for reuse or sale, aligned with the project's sustainable decommissioning goals. Together, these aims demonstrate WSG's commitment to safety, economic viability, and environmental responsibility, showcasing the strengths of its Advanced Ice Cleaning solution, for overcoming complex decommissioning challenges.

Project Conclusion

The successful de-inventorying of this intricate, multi-diameter methanol pipeline using WSG's Advanced Ice Cleaning™ solution has set a new standard in pipeline cleaning technology. By deploying a 40 m³ slug of high-solids ice slurry, WSG achieved thorough decontamination of the 8.7 km pipeline while also reclaiming over 75% of the saleable methanol, of which 80% was expected to be lost from water flushing – preserving its economic value and supporting sustainable decommissioning practices.

WSG's ice slurry technology demonstrates remarkable flexibility and effectiveness, handling complex configurations and varying pipe diameters without risking blockages. This approach successfully reduced

the pipeline's hazard rating from high to low, minimising environmental risks and easing regulatory burden leaving only 0.03% methanol in the pipeline (the original target was >0.5%).

As the oil and gas industry seeks safer, more environmentally responsible methods for pipeline maintenance and decommissioning, WSG's AIC™ solution offers a powerful, effective tool for tackling the industry's most challenging pipeline projects.

About WSG

WSG Energy Services is a global leader in pipeline management, maintenance, and decommissioning, known for its innovative solutions and unwavering commitment to safety and decarbonisation across complex energy projects. Headquartered in Normanton, West Yorkshire, WSG's UK operations span key locations in Great Yarmouth, Immingham, Middlesbrough, and Cramlington. Internationally, WSG provides its expertise across The Netherlands, Germany, France, UAE, Singapore, Malaysia, Indonesia, Canada, USA, Australia, and China, ensuring clients worldwide receive the highest standard of service.

For more information, visit <https://wsgenergyservices.com/>



The voice of the bulk storage and energy infrastructure sector



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