CELEBRATING 50 YEARS: CHEMICAL INCIDENT SERIES

INTRODUCTION

Ricardo have been supporting emergency services and the chemical industry from our conception in 1973 and have gained a wealth of knowledge and experience from supporting real-life incidents.

This eBook examines some of the biggest chemical incidents and the lasting impacts on organisational safety, response and regulation. Our emergency responders go through the incident in detail and explore what the public and private sector can learn from these iconic accidents, highlighting the ongoing importance of robust risk management.

We hope you find these case studies relevant and useful, and that they inspire the incident safety expert within you!

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DUDGEONS WHARF INCIDENT

The London Fire Brigade's (LFB) single greatest loss of life incident since World War II took place in 1969, when post-fire checks on an empty vessel at the decommissioned Dudgeons Wharf oil storage facility triggered an explosion with fatal consequences for five firefighters and one site worker. The firefighters and site worker had unfortunately been unaware of the explosive atmosphere which had formed within the facility.

Today, the tragic events of Dudgeons Wharf rarely feature on lists of industrial chemical incidents, yet the lessons learned from this disaster led to the creation of the Emergency Action Code Scheme (also known as HazChem Code) in the UK. This introduced a marking system for chemicals that instantly communicates the associated hazards to emergency service personnel. The Emergency Action Code scheme is now managed by Ricardo – having been involved since the start – and we think this is a fitting place to begin recounting our 50 years of supporting the chemical industry.

A six-month consultation period for submitting comments on the proposal and evidence to support potential derogations started on 22 March 2023.

Oil storage facility one

Dudgeons Wharf Oil Storage Facility 1 was located on the river Thames at the Isle of Dogs, Millwall, UK and consisted of over 100 tanks with a total storage capacity of 30,000 tons of oils. It operated until closure in the mid-20th century, and it was during decommissioning of the site that the tragic events occurred.

On 17 July 1969[2], work began to remove Tank 97, a cylindrical vessel with a total capacity of 500 tonnes fitted with a steel spiderweb roof. The vessel was designed to fail roof first so that in a failure scenario any fire or explosion would project upwards and away from people and property. Tank 97 had held myrcene but had sat empty for nearly a year and had been steam cleaned three days prior to removal.

The plan was to use an oxy-propane hot cutter to free the roof for removal, however during this operation smoke emerged from the vessel followed by a 20ft flame column erupting from the roof manhole cover. The LFB responded with three fire-engines supported by a foam tender and the Thames fire boat, but the fire had already been extinguished upon their arrival.

The fire was thought to have been caused by the vessel's construction material overheating during cutting. The fire service had a duty to ensure that the site was safe so as a precaution, soaked the vessel with water via a top access panel to minimise the risk of further fires. They also attempted to remove a lower access panel on the vessel to allow the fire service to conduct an internal inspection.

Unable to remove the bolts on this lower panel, it was decided the panel would be cut out, with five fire brigade personnel and one site worker remaining on the roof of the tank to continue soaking the vessel. As the cutting started, an explosion occurred within the vessel which ripped the roof straight off, with fatal consequences for all six men, and injuring five fire brigade personnel.

Why did an empty vessel explode?

A lack of knowledge of what the tank had been used to store was a fundamental factor to the incident. It is thought that the tank had been marked with the word "turps", but this marking alone would not have been sufficient to clarify the appropriate cleaning process that should have been used, or to provide information to feed into an assessment of risk levels during the decommissioning process.

Having contained myrcene which tends to polymerise when stored, forming a gummy residue on the surfaces of the vessel, the steam cleaning operations carried out will have broken down the residues releasing flammable vapours which when mixed with air, form an explosive atmosphere. Either residual heat from the initial fire, or a spark from the cutting equipment used on the inspection panel is thought to have triggered the explosion.

The first iterations of Hazchem Codes were released after the events of Dudgeons Wharf, with Ricardo starting to work with the LFB on the system they devised in 19743. Hazchem codes were used to mark buildings in the London area where hazardous materials were used, with a similar scheme also starting in the Cleveland and Tees-side area. In the years since the incident there have been many developments to hazard classification of chemical products and marking and labelling of storage and transport equipment. The Hazchem Code has been further developed into the Emergency Action Code (EAC).

How would an Emergency Action Code be implemented?

The EAC is two or three characters long and provides an instant response plan. The first number equates to an extinguishing media, the letter indicates appropriate PPE plus response tactics such as dilution, containment or reactivity. Occasionally a second letter is used to warn of a public safety hazard.

Figure 1

For Myrcene a placard, similar to that shown in Figure 1, would today be displayed during transport. From this simple panel, a lot of information is shared:

- The Red Class 3 diamond communicates flammable liquid.
- The number 3 advises foam, not water, should be used on fires.
- The letter Y states that full firefighter's uniform with self-contained breathing apparatus should be worn with any contained spillage to avoid entry to the environment, and also communicates a risk of violent or explosive reaction.
- (UN)2319 corresponds to a terpene hydrocarbon.
- The placards also include a telephone number to obtain more information, which can be provided by a specialist advice helpline, known as a chemical emergency response service.

Ricardo and the EAC scheme

Today, Ricardo are responsible for maintaining the EAC scheme which is published biannually as the Dangerous Goods Emergency Action Code List, in co-operation with the UK Home Office and published by The Stationary Office. In our 50th Anniversary year, we are delighted to have released the 2023 edition of the Dangerous Goods EAC List, available in print and as a digital version, accessible here.

During each update, feedback from regulators, emergency service personnel and industry is combined with Ricardo's emergency responders' recommendations based on recent incidents. Having started as a UK scheme, the EAC is now also used in Australia and New Zealand.

In future versions, we expect the EAC to be further refined to consider the environmental impacts of incidents, for example we are likely to see more scenarios where containment rather than dilute to wastewater is the suggested response. Similarly, there is a growing concern around firefighting foams that contain per- and polyfluoroalkylated substances (PFAS), which can be environmentally damaging and therefore impacts when they should be recommended.

Conclusion

Although storage vessels are not in scope of EACs and the vessel was thought to be clean, the events of Dudgeons Wharf pushed the protection of emergency service personnel from chemicals into the spotlight, progressing the discussion of how to communicate emergency response procedures clearly and quickly when other sources of data are unavailable, such as on a road during transport.

Today the Dudgeon's Wharf site is part of a housing estate, with a memorial plaque for the six people who tragically lost their lives.

Is your organisation prepared to prevent an incident?

This incident raises several questions that are relevant to response today:

- Are your staff able to interpret an Emergency Action placard if required?

- What emergency response plans are in place, and is there capability to communicate both product information and actionable response advice on the chemicals involved to the emergency services and other first responders?
- Have your staff that work with chemicals had training in hazard awareness and are there people trained for first response?
- When transporting goods, do your vehicles display the correct placards?
- Is your emergency phone number provision able to provide meaningful and robust advice, aligned to Cefic's guidelines for level 1 emergency response?

The emergency services and chemical industry constantly face risks and challenges when managing chemical incidents. While such incidents are unfortunately difficult to avoid, when they do happen, access to emergency response support with rapid around-the-clock provision of expert advice in the callers' local language will help reduce the impact of a chemical incident on people, the environment, assets, reputation and liability.

Ricardo operates a market leading telephone emergency response service available 24/7/365. Our incident training experts complement this advice by supporting organisations to deliver safe, effective and competent emergency responses to hazmat incidents.

DDT and the Silent Spring

When exploring the adverse historical impacts of dichloro-diphenyl-trichloroethane (DDT) use in the US, we must comment on how the public perception of the substance was influenced by the publication of Rachel Carson's book 'Silent Spring' in 1962. The shift in perception affected its use as well as the regulatory landscape of DDT; an event which has become an important case study for the management of harmful substances[1].

Dichloro-diphenyl-trichloroethane (DDT) was developed in the 1940s as the first modern synthetic insecticide initially used to combat insect-borne human diseases and for insect control in crops, where it quickly became a success as a pesticide. However, in the late 1950-60s it began to see regulatory actions due to mounting evidence of the pesticide's detrimental ecological and toxicological effects. In 1972 a cancellation order for DDT was issued by the US Environmental Protection Agency (EPA). More recently, studies in animals have continued to suggest a relationship between DDT exposure and health effects such as tumours and effects on reproduction. Today, DDT is classified as a probable human carcinogen by US and international authorities[2].

The 'Silent Spring' effects

The essence of the 'Silent Spring' book, which was based on extensive research carried out on pesticide products including DDT, saw that the use of these substances had led to a significant, unintentional impact on species beyond those they were intended to control.

The title of the book, 'Silent Spring', highlighted the broad spectrum of species that could unintentionally be affected by pesticides and potentially disappear from the ecosystem. One specific example was the impact on bird populations arising from the use of DDT to halt the spread of Dutch elm disease in the US. In the book, anecdotal evidence was provided by a local resident which linked the spraying of trees with DDT in a particular town to the absence of returning migratory birds in the spring; no morning birdsong – a silent spring.

The link between DDT use and the reduced bird populations was also evident in a study of the robin population at Michigan State University campus during a period when elm trees on the campus were being sprayed with DDT. The insecticide was used to eliminate elm bark beetles that were responsible for spreading Dutch elm disease from tree to tree. In the first year of spraying, little effect was seen on the robin population but by the following and subsequent springs, high death rates were being recorded among the returning adult robin population and very few young birds remained.

The link between DDT and the robin population was made in several steps: studies initially provided evidence that the leaves from the trees had become coated with DDT which could not be removed by the rain, and when the leaves subsequently fell during the autumn, earthworms were active in consuming and breaking down the leaf litter where DDT was seen to accumulate in the worms. These earthworms were a significant food source for the returning robins in the spring.

After a second spring of spraying the trees with DDT, the insecticide had accumulated in the worms to such a level that as few as 12 worms had become a fatal dose for the robins. Even if a fatal dose had not been ingested, it was suspected that DDT was having significant effects on reproduction and impacting the number of healthy infant robins being born.

Trees, Worms and Fish

'Silent Spring' also highlighted that the aquatic environment could be affected by DDT usage in the example of forests, which had been sprayed in the New Brunswick area of Canada. In this case study, the insecticide was used to control the population of spruce budworm to protect trees that were to be felled for timber. The New Brunswick forest area, including the Miramichi River that flows through it, provided large areas for Atlantic salmon hatchlings to feed in the streams. A significant increase in DDT use in this area from 1953-4 was found to have had a major impact on the salmon population. Whilst this did not lead to an immediate stop to DDT use in the area, its use was ultimately phased out.

Studies have since been carried out to address concerns over the persistence of DDT in the environment. A recent 2016 study from Josh Kurek et al3 on sediment samples from lakes in the New Brunswick area showed that whilst DDT levels had peaked in the 1970-80's, its levels in modern samples exceeded the probable effect concentrations (concentration above which adverse effects are likely to be observed), which suggests that DDT might still be having an adverse effect on the aquatic ecosystem. This shows how decisions on chemical use made decades ago can still impact the ecological system today.

Scientific concerns on the impact of chemicals periodically transition from scientific research to the popular media. 'Silent Spring' was one such example, which resulted in a major change in public perception of the environmental impact of chemicals and ultimately led to regulatory changes in the US.

Whilst DDT is a specific example and no direct comparison is being made with other substances, we are currently seeing an increased media and regulatory focus on PFAS, referred to as 'forever chemicals'. These substances are used in a variety of applications from cosmetics to fire-fighting foams as their chemical stability – a key reason why they were originally developed – is now recognised as a cause for concern, particularly due to the time it takes for them to degrade and be eliminated from the environment.

Conclusion

Substances which are harmful to health and the environment are coming under greater global scrutiny. Understanding the biodegradability and potential persistence of your products is critical for your future business. Knowing how the products you put on the market impact the environment should be the focus of your organisation's sustainability ambitions, with biodegradability being a key indicator of the potential long-term impacts on nature, but biodegradation testing can be challenging, and it is important that tests are set up and results interpreted correctly, requiring expert knowledge.

It is particularly timely that we are looking at an incident where environmental contamination has created a long-term challenge as it has strong parallels to per- and polyfluoroalkyl substances (PFAS) which are currently seeing growing regulatory scrutiny due to public awareness from the 'Dark Waters' scandals in the early 2000s.

Ricardo work on a range of national, European and global initiatives to support overall chemical safety and have a broad spectrum of expertise – from immediate emergency response advice required for major chemical spillages and fires, to detailed analysis on the long-term fate and behaviour of substances in the environment. Our environmental chemistry and toxicology team are currently undertaking projects ranging from improving methods for assessing chemical biodegradability, to researching the environmental hazards and risks of specific substances.

With extensive experience of dealing with the identification and management of hazardous substances including PFAS, Ricardo can support you in understanding the impact of PFAS on your business operations and your product portfolio and implement processes and policies to help you transition away from PFAS.

THE BEACHING OF THE MSC NAPOLI

Incidents where multiple products are involved present a major challenge for any organisation involved in the response. These incidents require not only an understanding of the hazards of each individual product, but also of the potential reactions between the products should they mix – a key consideration when the container ship, MSC Napoli, was involved in an incident in 2007.

Challenges of a multi-product incident

During a voyage from Belgium to South Africa, MSC Napoli encountered gale-force winds while crossing the English Channel. With giant waves causing serious damage to the integrity of the ship, the captain sent out a distress call and the crew were safely evacuated. However, a major challenge remained: how to safely recover the floating but stricken vessel and its cargo.

To shelter from the extreme winds, MSC Napoli was towed towards the southern English coast and deliberately run aground on the Branscombe beach in Devon, UK. Those responsible for the consequent impact of the incident on people and the environment knew that the vessel was carrying a significant quantity of dangerous goods. It was critical that the immediate risks to those working close to the vessel along with the long-term risk to the marine environment were understood. At this point, Ricardo was brought in to help.

Challenges for Ricardo's emergency response team

Information from the containers on board the vessel was sent to Ricardo in the form of the Dangerous Goods Manifest, which listed each hazardous container with key information including original location of the containers, the Dangerous Goods UN numbers, proper shipping name, packing group and quantity of each material.

The manifest was over 100 pages long and it was a challenge for the Ricardo team to provide an accurate and timely response having reviewed the data. A typical day for Ricardo's emergency responders involves a lower number of calls per responder and only one or two products at a time, meaning this was considered a major incident and a significant challenge for our response resources. Back-up procedures had to be activated to access more people for the response and to maintain business as usual.

A taskforce was formed to review the information from several data sources, including the manifest – our team's priority was to identify products that could immediately escalate the incident further. Factors considered in this assessment included substances with the potential to react with water, products that would require chemical stabilisation such as temperature control, and products classified as extremely flammable and/or toxic by inhalation.

Once the highest priority products and containers had been identified and details communicated to those at the incident scene, the second priority was to rank the level of marine environmental risk from the products if they were released. A quantitative risk assessment for each product was made, placing them in either high, medium or low risk bands based on their ecotoxicological properties and behaviour. Our taskforce experts applied their experience and chemical expertise to allocate the products into these categories.

Salvage operation

The overall salvage operation initially focused on removing fuel and other oils before cranes were used to move containers onto barges which were then taken to Portland, Dorset, for damage assessment. Ricardo specialists provided more information on the hazards of the materials in the containers and advised on the protective equipment that should be used by the operators opening the containers.

The final remediation step was to remove the ship itself. Part of the ship was re-floated and taken to Harland and Wolf shipyard, Belfast, and part was dismantled in-situ at Branscombe beach.

The overall response to the MSC Napoli incident required the involvement of multiple UK agencies, including the Maritime and Coast Guard Agency, the Environment Agency, the Health Protection Agency, the Centre for Fisheries and Aquaculture Science, the police, and others. The outcome was successful and the subsequent reviews on the level of preparedness for the incident and the actions taken during the response provided opportunities for further improvement in response planning.

Ricardo also took the opportunity to review its plans for responding to incidents of this scale: the methodology used to review the data and rank the hazards has subsequently been used as a blueprint for all multi-product incidents, whether these occur on a ship, in a warehouse or during road or rail transportation.

One key area which the review identified was to test and exercise our own back-up processes. During the incident, these had worked well – in terms of adding resources quickly to work on the response – but this was the first time they had been used in a major incident. We therefore extended our existing program of exercises to routinely practice our back-up processes with the internal exercises providing a low-risk environment in which our teams can evaluate the efficacy of our response plans, processes and knowledge.

We strongly encourage all organisations in the chemical supply chain to exercise their incident response plans, and specifically the initial Level 1 advice provided by telephone to people at the scene of an incident.

Conclusion

This incident has demonstrated the need for and importance of ensuring that an organisations' emergency response arrangements are robust, fit for purpose and meet their expectations as well as of those who may be involved in an incident with their product(s).

The multi-product incident from the beaching of MSC Napoli has been and continues to be used as a training case study for the Ricardo team. The same level of value is still placed on running exercises to ensure that we are prepared for a wide range of incidents. Ricardo's emergency response service can support all those in the supply chain that use an organisation's products to respond effectively, by providing meaningful and actionable advice.

Exercising your Level 1 emergency response

A Level 1 telephone emergency response provision is a crucial component of developing a compliant and commercially responsible chemical safety strategy. A key aspect of managing the safety of products along the supply chain is to plan for any potential incident and ensure that when incidents do occur, the impact on people, the environment, assets and reputation is mitigated. It is therefore vital to regularly test the effectiveness and capability of your emergency response provision to deliver support when required, and continuously refine and improve its capabilities so that it is fit for purpose.

Our experience shows that many organisations do not know how to structure an emergency response exercise programme that achieves their objectives in the most effective way.

SPOTLIGHT ON CHLORINE

Our experience over the years has been that no two incidents are ever the same, with an unending number of variables impacting the incident and the advice we provide. The chemical substances involved, location of the incident, volume of materials, weather conditions, and the experience of the caller are just a sample of the factors influencing our response team's approach to the support they provide. There are patterns in the types of call we receive however, and there is one substance that has provided us with many opportunities to support our callers over the past 50 years: chlorine.

Chlorine containing compounds have many industrial uses ranging from poly vinyl chloride (PVC) used extensively in construction, through to cleaning and sanitation applications ranging from standard bleach cleaning products to large-scale water treatment.

Chlorine is a highly hazardous substance with potential adverse effects on health and the environment and due to its physical properties, any incident of chlorine release has the potential to escalate quickly. This has been seen in several large-scale chlorine releases, such as the Graniteville train disaster in the US and the major accident at the Port of Aqaba in Jordan. The impacts of both incidents were clearly tragic, but thankfully incidents of this scale are relatively rare. Our chemical emergency response calls have been more commonly focused on incidents where chlorine is produced in a reaction, normally from the accidental mixing of two or more chemicals which, whilst the scale of the incident is smaller, the risk of potential serious injuries remains. Two types of chlorine-based product have been responsible for most calls made to our emergency lines: swimming pool chemicals and cleaning products.

CASE STUDY: PORT OF AQABA, JORDAN

In June 2022, a container filled with chlorine was dropped whilst being transferred by crane from the dockside onto a ship. The tank fell onto the ship where it was punctured resulting in an instantaneous release of chlorine. Videos of the accident show a large cloud of yellow gas forming around the ship and quickly travelling along the dock.

Tragically the incident led to at least 13 fatalities and local medical facilities being overwhelmed with injured people.

Residents of the town were warned to remain indoors whilst experts from the Civil Defence Service worked to resolve the incident. Local tourist beaches were also closed until it was established that the gas had dispersed.

Swimming pools and cleaning products

Swimming pools

A range of chemical products are used to maintain water quality in swimming pools. Often a chlorinating product will be used as a disinfecting agent for the pool water. Different substances can be utilised including sodium hypochlorite and chlorinated isocyanurates; in all cases they will be applied to produce a safe level of chlorine in the pool water to provide a disinfectant effect.

Typically, a pH adjuster will also be used to keep the pool water an optimum pH level and these products are often acidic, with sodium bisulfate or hydrochloric acid being used.

The major problem is that the chlorinator products will react with acids to produce chlorine gas, so when the correct process isn't followed and the undiluted chlorinator and pH adjuster products get directly mixed, chlorine will be released. The reactions are typically instantaneous, presenting a significant risk to the person who accidently mixed them.

The example from the London Aquatic Park incident is typical of the many calls we receive per year.

CASE STUDY: LONDON AQUATICS CENTRE

An accidental chemical reaction resulted in the release of significant quantities of chlorine gas at the Queen Elizabeth Olympics Park in Stratford, London, in March 2022.

The chlorine release resulted in the Aquatics Centre being evacuated in a major operation conducted by the emergency services. Around 200 people were evacuated, some having to leave directly from the swimming pools. More than 50 people requested assistance from the paramedics attending the incident, with 29 people being taken to hospital with breathing difficulties.

Cordons were put in place around the Aquatic Centre and people living close by advised to stay inside with doors and windows closed. High pressure ventilation fans were used to assist in extracting gas from the building to disperse into the atmosphere.

Cleaning Products

Incidents involving cleaning products typically start with a blocked drain or toilet. A domestic cleaning or "unblocking" product would first be used with limited effect, so further products are then added... When a hypochlorite-based bleach type product is mixed with an acid based cleaner a reaction leading to the production of chlorine gas can be triggered.

Our priority is to confirm the identity of the mixed products and that the chlorine is as a result of a reaction between the products. Once confirmed, key advice on immediate first aid, evacuation of the affected area and potential cordon size, remediation and decontamination is crucial. There is a significant risk of delayed health effects for anyone potentially exposed to chlorine, so it is incredibly important to ensure this has been understood and communicated quickly.

Whilst chlorine producing reactions are the most common type of call we receive, incidents involving reactions between other products, or the decomposition of a single product, are core aspects of our emergency response work. Our team of emergency responders are degree qualified chemists who receive additional training on the application of this chemistry knowledge to incidents. They are also supported by a highly experienced supervisor team who can be contacted 24/7/365 to provide additional expertise for more complicated incidents.

We consider this chemistry knowledge the most important capability in our response team. A key feature in the CEFIC guidelines for Chemical Emergency Response is knowledge of chemicals and chemical behaviour, as this understanding in an incident underpins many of the other key features of good Level 1 response, for example, the provision of advice tailored to circumstances and tactical or regulatory awareness. It is therefore key to ensure that emergency response arrangements consider the potential reactions involving your products, and not just their hazard classification, as your Level 1 emergency response will be the starting point for providing immediate support to anyone in your supply chain after an incident occurs.

CASE STUDY: GRANITEVILLE TRAIN DISASTER

In the early hours of January 6th, 2005, misalignment of a railway switch close to the town of Graniteville, South Carolina, USA, resulted in a collision between two freight trains and the subsequent derailment of rail cars. One of the trains was carrying several dangerous goods including chlorine.

A chlorine tank containing 90 tons was damaged, leading to a significant release of the chemical. Sadly 9 people lost their lives in the incident with a further 250 requiring hospital treatment, and over 5000 people being evacuated to a safe distance from the chlorine release.

The incident also had major financial impacts on the town with businesses responsible for the majority of employment in the town being impacted to the extent where they closed down. The disaster exposed the vulnerabilities in the transportation of hazardous materials and prompted safety reforms in the railroad industry. It also had lasting environmental effects on the community, highlighting the need for improved emergency response and preparedness for such incidents.

Conclusion

Exercising or testing of your emergency response processes is vital, as it provides a low-risk environment in which to evaluate the performance of your emergency response provision, give relevant employees and stakeholders the opportunity to safely build incident experience, and ensures you can be confident that when an incident occurs your Level 1 telephone emergency provision will perform as you expect. Ricardo have developed guidance to support organisations in testing their emergency response arrangements to ascertain if these would provide the support required in these sorts of incidents, available below.

SOLUTIONS FOR THE CHEMICAL SECTOR

Ricardo's in-house team of chemical response, compliance and sustainability experts are on hand to support your journey to a safe and sustainable future.

Emergency Response

Our emergency responders are available to your customers and those handling and using your products emergency advice 24/7/365, supporting callers in resolving incidents quickly and safely, by going beyond simply providing product information or safety documentation. Insurance to provide advice is only given to trusted experts in their field of work, making us unique in our approach to incident response while helping frontline responders gain control of the scene, support the mitigation of the impact, ensure your customers get the help they need and reducing harm and ultimately minimise the impact to people, environment, assets and reputation.

Our supporting Chemdata mobile app provides instant access to details on over 62,000 chemical substances, enabling swift and proportionate response to a chemical spill or incident. Used by government bodies; fire, police, and ambulance services, airports, ports, and harbours around the world to inform their response to chemical incidents.

Regulatory and compliance

Ricardo perform chemical registrations, plan and manage testing strategies, and assist with ongoing regulatory responsibilities. We also update existing registrations and manage the ongoing regulatory responsibilities of companies post-registration to support you maintain access to regulated markets.

Advance notice of regulatory changes and the impact they will have to business operations enables organisations to act strategically, rather than reacting quickly – and usually paying the price. Undertaking regulatory risk assessments provides a clear view of which chemicals, compounds or products may be impacted in the short- and long-term future and provides an opportunity to explore alternatives. Our experts can support by providing actions and advice following the results of the assessment.

Environmental chemical and toxicology

Establish true sustainability throughout your product portfolio and minimise risk with our expertise in environmental chemistry and toxicology. We can support your businesses in placing, monitoring, and evaluating regulatory tests, and provide specialist expertise in developing alternative approaches to standard testing requirements.

The risk level or regulatory controls associated with a substance can change frequently, often with the status of a chemical progressing in severity meaning substances become more challenging to use or even deem them inaccessible. Through understanding the scale of challenge this poses for substances used by your organisation and throughout your value chain, our experienced chemical experts can advise where forthcoming regulatory change may present a risk, seek alternative substances, and make recommendations.

Chemical sustainability

Our deep scientific analysis supports organisations to develop more sustainable products and/or demonstrate their already impressive environmental credentials. Through applied frameworks we can quickly reveal the 'hot spots' in your organisational processes or product life cycle, propose alternative solutions and assess the benefits of interventions to reduce significant uses of energy, water and raw materials, and associated cost savings.

Our expertise includes decarbonisation and net zero strategies; materiality and life cycle assessments; emissions measurements and carbon foot-printing; and development of climate transition plans to demonstrate to regulators, investors and other stakeholders the targets and actions your business is investing in for effective implementation of a low-carbon future.

Training

Prepare potential first responders to chemical incidents with knowledge and practical experience to ensure competence when dealing with an incident involving hazardous materials, potentially minimising the impact to operations, people, environment, assets and reputation with appropriate and swift response should an event occur.

Learners gain the ability to recognise hazards and understand the information that accompanies chemicals, offering a comprehensive view on the properties of chemical substances and how they might behave when spilt, enabling learners to fully assess the risks associated with a spill and devise a plan to deal with it, enabling the response team to follow a safe way of working.

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DDT and the Silent Spring

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