

# RISKworld

The Newsletter of Risktec Solutions

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Welcome to Issue 43 of RISKworld. Feel free to pass this edition on to other people in your organisation. You can also [sign up here](#) to make sure you don't miss future issues.

We would also be pleased to hear any feedback you may have on this issue or suggestions for future editions.

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Sharing information from Health, Safety, Security and Environmental (HSSE) cases with a workforce has always been a challenge, but as Ewan McNeil explains, there's now an app for that.

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*"The only thing that is constant is change." – Heraclitus*

As we move towards the middle of 2023, it's a good time to reflect on the inevitability of change, and the opportunities and challenges that this presents for the future at Risktec, and for business as a whole.

We continue to see demand in all business sectors, and have been delighted to welcome many new people into the company. This certainly gives pause for thought around the competency and skills that Risktec, and the STEM sector as a whole, require now and into the future, and this is something we explore in this issue.

With over 370 employees, it is also fitting that we shine a light on some of our people and their lives as consultants. This issue includes a Q&A with three of our team with diverse skillsets and experience.

As we look towards the future and consider the twin challenges of emerging technologies and ageing facilities, it reminds us how important risk-informed decision making remains. Two of this month's articles illustrate how new thinking can help, with examples relating to Carbon Capture and Storage (CCS) liability insurance and dam safety.

Technology-based solutions to safety management have a large part to play as we move forward, and we showcase the use of mobile app technology to address a challenge that the safety and risk industry has always faced – how to usefully share the output of safety studies in a meaningful and tailored way.

As part of our own focus on continuing to meet our clients' needs on an ongoing basis, we continue to measure client satisfaction in our bi-annual survey, with the most recent results showing that we continue to maintain very high levels of client satisfaction.

Our overall score of 'good' or 'very good' for our flexibility and responsiveness to client requirements was 98%, and 99% of respondents say the technical knowledge of Risktec personnel was 'good' or 'very good'.

I hope you enjoy the articles and find some food for thought. As always, we welcome your feedback and look forward to your continued support.

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# Bowties for Every Occasion – The application of bowtie analysis in the dams sector

The benefits of using bowtie diagrams for risk management have been realised by organisations worldwide for many years, notably in high hazard industries. However, increasingly the bowtie analysis technique is proving useful in new settings, such as the dams sector, where the focus is on the potential for extremely high consequence structural failures, albeit at very low frequencies.

## INTRODUCTION

Few single-event hazards have the potential for causing as many fatalities as catastrophic dam failures, which often attract a severity similar in magnitude to nuclear incidents or natural disasters. Although catastrophic dam failures are rare, in the US alone, state dam safety programs reported 760 dam safety incidents over a 10 year period in the mid-2000s (Ref. 1).

In the most recent Infrastructure Report Card, the American Society of Civil Engineers (ASCE) gave US dams a “D” grade (Ref. 2). The report indicates that with a steadily rising average age of 56 years, mounting maintenance issues and a growing at-risk population, the number of high-hazard-potential dams and deficient high-hazard-potential dams continues to climb.

This issue is universal, and has resulted in increased focus on the design, ongoing operation and maintenance of dam structures across the world. The need to ensure proper,

robust risk management, notably addressing the risk to downstream populations, has been recognised in a series of guidelines and regulations, including:

- Interagency Committee on Dam Safety (ICODS): Federal Guidelines for Dam Safety Management (Ref. 3)
- International Commission on Large Dams (ICOLD): Dam safety management (Ref. 4)
- Australian National Committee on Large Dams (ANCOLD): Guidelines on Risk Assessment (Ref. 5)

The challenge for the reservoir industry is to develop and implement a means to consistently and reliably measure and track the dam risk and its management status.

Fortunately, a range of proven and robust risk management methodologies already exist within the high hazard industries, which can be applied to dam structures, allowing us to:

- Appropriately assess and manage the risk profile of dam facilities over time
- Develop a straightforward means by which the risk profile can be conveyed
- Demonstrate compliance with regulatory requirements and prioritise deficiencies

## BOWTIE METHODOLOGY

Bowtie analysis, a commonly-adopted methodology within high hazard industries, helps the risks associated with the operation of dam structures to be better understood, managed and communicated to stakeholders, e.g. at-risk populations, companies and regulators.

Through graphical representation, bowtie analysis can map threats that may impact dam safety or the ability to maintain safe operation, identify and assess the safeguarding in place to prevent or mitigate different scenarios, and highlight any deficiencies or non-conformances.

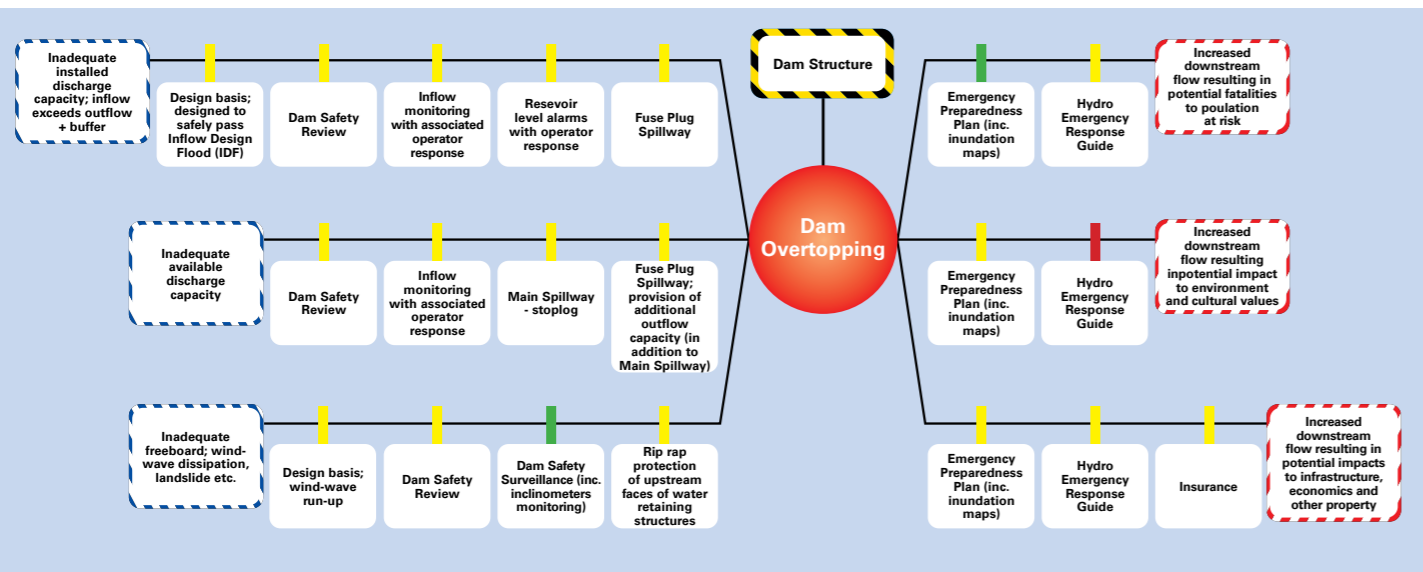


Figure 1 - Simplified Overtopping Bowtie



Bowties can be readily developed for any of the more common dam failure mechanisms and other safety issues, including:

- Dam overtopping
- Compromised structural integrity
- Unintended or uncontrolled release
- Reservoir misoperation
- Public interaction with dam facilities

An example bowtie for a common dam failure mechanism (overtopping) is provided in Figure 1.

## RISK PROFILING

Bowtie analysis is not a panacea for managing dam safety, but can be integrated within a wider risk management framework, which enables:

- Vulnerabilities (deficiencies and/or non-conformances) to be identified, and their impact on the risk profile to be assessed
- The effectiveness of the preventive and mitigation barriers to be monitored
- Remediation activities to be prioritised based on their contribution to a reduction in risk for the structure

This vulnerability-based risk assessment methodology follows a semi-quantitative analysis approach and is generally based on the findings of dam safety reviews. As such, it

provides an indicative measure of the potential risk that the structure may pose. A standardised set of criteria can be developed to augment the assessment, which takes account of:

## Barrier Effectiveness

- Is the barrier in place (e.g. is the rip-rap protection installed per specification)?
- Is the barrier functional (e.g. is the leak detection functioning per its design intent, or impaired or deficient in some way)?
- Is the barrier adequate (e.g. is the spillway designed to accommodate the Probable Maximum Flood capacities)?
- Is the barrier reliable (e.g. barrier is adequately maintained per Preventative Maintenance (PM) schedule)?

## Significance of Noted Degradation

- Is the noted issue a deficiency, thus directly impacting dam safety (e.g. undersized spillway)
- Is the noted issue a non-conformance with regulation, but not directly impacting dam safety (e.g. drainage system clogged with eroded material)

## Demand on Barrier

- What is the ‘stressing’ placed upon the impacted barrier (e.g. what is the Probable Maximum Flood event frequency and therefore how often is the spillway likely to be relied upon?)

Bowtie analysis serves as the framework for this assessment, allowing the risk profile to be better understood, data to be entered in a structured and consistent manner, and the assessment results to be transparent and easily communicable to all stakeholders.

The latter is of particular significance in the dam industry, given the increasing age and demands placed upon structures, and the subsequent risk presented to downstream populations and the environment.

## CONCLUSION

With a significant number of dams in operation across the globe, many of which are approaching their life expectancy, it’s important that the associated risk to people and the environment is well understood and appropriately managed.

One useful technique to achieve this goal, borrowed from traditional major hazard industries (e.g. oil & gas, nuclear), is bowtie analysis. When used in combination with an integrated risk management framework, it provides a powerful way to visualise, assess and manage risks to dam safety.

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# Mind the Gap – Ensuring organisational competency and employee retention

With a general shortage of workers in the Science, Technology, Engineering and Maths (STEM) sectors, many organisations are asking themselves how they can identify and manage their competency gaps now and into the future, with a much sharper focus on staff retention and development.

## INTRODUCTION

In the UK alone there is estimated to be a shortfall of over 173,000 workers in the Science, Technology, Engineering and Maths (STEM) sectors, with an estimated average of 10 unfilled roles per business in the UK (Ref. 1).

Correspondingly, these positions are difficult to fill directly by recruitment, with the Institute of Engineering and Technology (IET) identifying that 49% of engineering and technology businesses are finding there's a lack of skilled candidates available (Ref. 1).

This places the onus on organisations to manage gaps more organically by developing staff. Allied to this is a requirement to identify competence

needs much earlier and more systematically, so that current and future gaps are identified alongside development planning, without relying on future recruitment alone.

This article looks at the competence management cycle and the part that training can play in ensuring ongoing organisational competence and staff retention.

## WHAT IS COMPETENCE MANAGEMENT?

Competence management can be defined as *“the process for ensuring that enough suitably competent people are available to meet current and foreseeable business needs.”* (Ref. 2).

When thinking about what comprises competence on the level of an organisation or individual, it can be broken down into three main components:

- Knowledge and experience: what we know
- Skills and abilities: what we can do
- Attitudes and behaviours: how we go about it

The ability of an organisation to align these components with its current and future business strategy is generally managed by a Competence Management System (CMS), with an example CMS cycle shown in Figure 1.

The CMS can also capture any competence requirements required by legislation, licence conditions, professional standards, company procedures, project processes, customer requirements and improvement initiatives.

## HOW TO MAINTAIN AND DEVELOP COMPETENCE

Where a CMS is in place and has identified a current or future competence gap, then the organisation can address the gaps in the required knowledge, experience, skills and behaviours by:

- Recruitment of personnel who already have those attributes, or
- Development of those attributes for new or existing personnel

With respect to upskilling new or existing personnel, this requires consideration of the needs of the organisation as a whole, down to the level of the individual.

These needs may be met by coaching and on the job mentoring, but there



may also be a case for more formal structured training.

## TRAINING NEEDS ANALYSIS (TNA) AND THE TRAINING PLAN

A Training Needs Analysis (TNA) is an effective way to identify required training. The TNA forms the basis of the Training Plan and uses the CMS to highlight knowledge or experience gaps and to ensure existing competency is maintained.

The TNA also defines:

- The specific training courses or methods to be used, including identifying training which may not have been used or considered before
- The priority of the training needs of the organisation and individuals

- A schedule of training for the next year(s)
- Required training resources

The current Learning & Development (L&D) resources (both in-house and external training providers) should be evaluated to confirm whether they are sufficient to meet the needs of the Training Plan. This allows timely planning of any additional or specialist training provision.

The methods of delivery available also require some consideration in the Training Plan – for example, to determine if all training should be face-to-face, or if other online e-learning or distance learning options are available and appropriate.

## HOW RISKTEC CAN HELP

Risktec has experience in all areas of competence management and assessment, and can work with you to develop a targeted and achievable TNA and Training Plan.

We have a portfolio of over 50 training courses that can be customised and delivered face-to-face or online. Our self-paced, accredited courses for Continuing Professional Development contribute to CPD hours, while at the highest level of competence, we offer an MSc in Risk and Safety Management.

To plug gaps in skills or experience, Risktec Resourcing is able to provide suitably qualified and experienced personnel, from individual associates in the short-term to multi-disciplinary teams on long-term assignment.

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## TRAINING FOR RETENTION

As well as the benefits which can be achieved through the training and development of staff in terms of fulfilling competency requirements, staff retention can also be improved through targeted investment in career development.

Training and development opportunities are unsurprisingly viewed as desirable by individuals, with recent LinkedIn Global Talent Trend reports finding that:

- Companies rated highly for 'Employee Training' have a 53% lower staff attrition rate (Ref. 4)
- 'Professional development opportunities' was selected as the top area to invest in to improve company culture by 59% of respondees (Ref. 5)

Investment in training and education therefore has a two-fold benefit – delivering organisational competency, while aiding staff retention.

## CONCLUSION

With the skills shortage deepening, ongoing competence development of personnel is vital for ensuring that an effective workforce is in place.

Continuing to develop the skills of those already within the organisation, as well as carefully planning the route to upskill new joiners, helps to mitigate future skills gaps within an organisation.

Training and development is also highly valued by employees, to the extent that the act of implementing a pro-active Training Plan can aid staff retention and motivate personnel.

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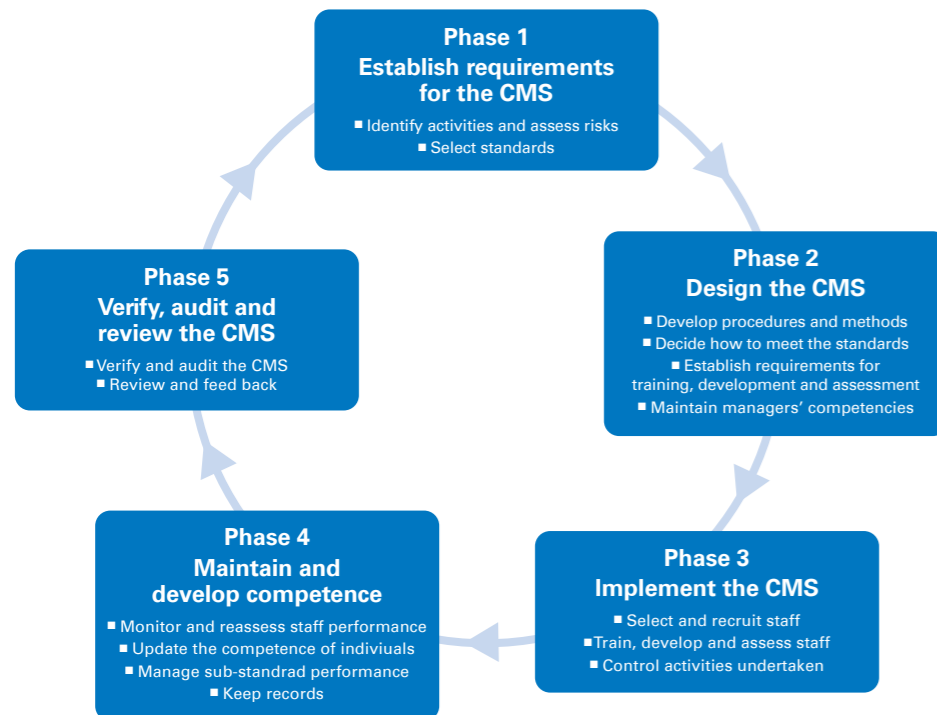


Figure 1 - Competence Management System Cycle (Ref. 3)

# CCS Liability Analysis – Calculating the insurance risk of CO<sub>2</sub> leakage from carbon capture and storage

Once carbon is safely stored, we have a responsibility to keep it in place. Aside from the environmental impacts of any leaks, there can also be financial impacts on operators, which may be hedged by insurance. In this article we take a look at how standard safety risk assessment techniques can be used to quantify the financial risk associated with CO<sub>2</sub> leaks from Carbon Capture and Storage (CCS) projects.

## DRIVERS FOR QUANTITATIVE ANALYSIS

With all endeavours, but particularly for novel technologies or new applications, comes the need for assurance that risks are acceptable. For CCS projects, operators, regulators and governments have an interest in quantifying the likelihood and magnitude of CO<sub>2</sub> releases to confirm that risk targets can and will be met. In the longer term, the government may also eventually assume the leakage liability for the storage site post-closure.

From the outset, operators have a clear financial incentive to minimise CO<sub>2</sub> leak risks, as they are effectively being paid to store the CO<sub>2</sub> securely. They may choose to transfer some or all of the financial liability associated with leaks through insurance, but this comes at a price – the insurance premium – which must be calculated and accepted by the insurers and underwriters based on quantitative analysis of leakage risks.

Whilst structured qualitative methods, such as bowties, allow for a clear understanding of the controls in place to manage CO<sub>2</sub> containment risk, additional techniques are required to provide quantitative risk estimates.

## OPERATIONAL EXPERIENCE AND DATA ARE SCARCE

For standard, known operations (e.g. pipeline transportation) there are accepted methods of quantifying safety and financial risk which have been developed over many years. Any risk estimate outputs are underpinned by registers of historical data.

For the nascent CO<sub>2</sub> storage industry, there is limited operational experience at only a handful of storage projects.

In particular, subsurface leaks from a storage site are tricky to assess, given the difficulties in characterising and predicting the behaviour of geological structures several kilometres below the surface, compounded by the inherent uncertainty [Ref. 1].

## RISK ANALYSIS

Calculating the CO<sub>2</sub> leakage risk involves identifying critical leakage scenarios, and then estimating:

- The likelihood of occurrence
- The mass of CO<sub>2</sub> released
- The associated costs

Typically, the outputs required will come in the form of:

- A list of credible leakage events
- The annual probability weighted mass/cost of leaks
- A loss exceedance curve (e.g. Figure 1)
- A time-varying expected cost profile throughout the project (e.g. Figure 2)

Scenarios may be identified via structured techniques such as HAZID, by reference to established sources such as the Features, Effects and Processes (FEP) database, or by reference to research studies, especially where geological leak paths are concerned.

## SCENARIO ANALYSIS

Process Quantitative Risk Assessments (QRAs) for the capture and transport portions of CCS projects make use of established methods of leak quantification – such as parts count with frequency analysis – and provide estimates of both the frequencies and severities of leaks. Non-process risks, such as those relating to ship collisions and dropped objects, are also straightforward to evaluate using standards methods and data.

Leaks from the storage site, either via geological pathways or via wells, are less readily quantifiable, however a number of studies have developed

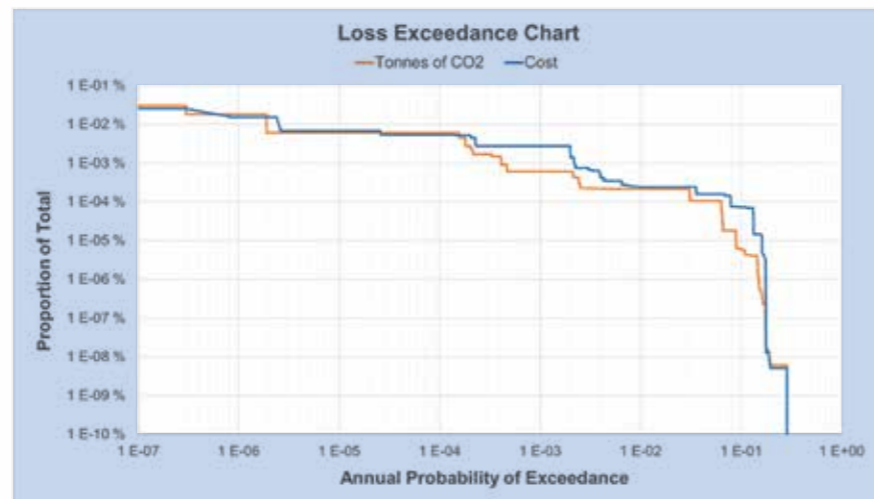


Figure 1 - Annual CO<sub>2</sub> Mass and Cost Loss Exceedance Chart

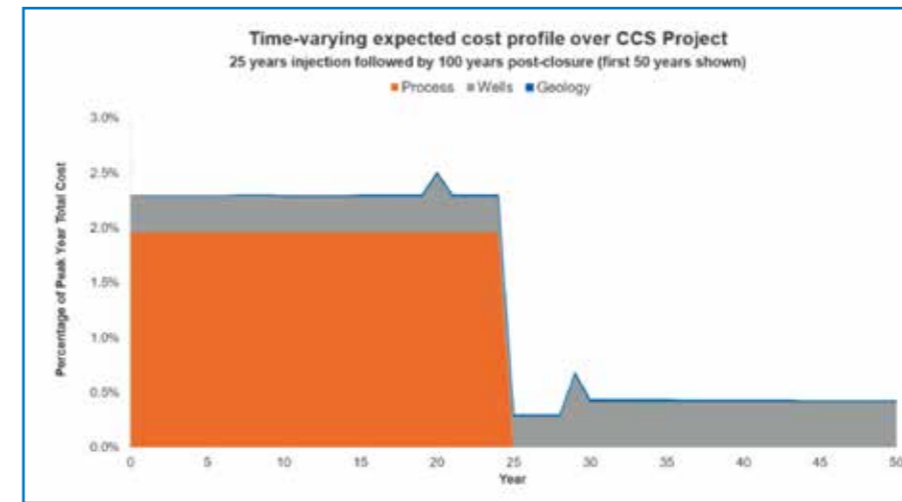


Figure 2 - Time Dependent CO<sub>2</sub> Leak Liability throughout a CCS Project

data for release scenarios from storage sites in the North Sea (such as Refs. 2 to 4). For each release scenario, the studies provide generic estimates of likelihood of occurrence (e.g. per year, or per project over its lifetime), the mass of CO<sub>2</sub> released (e.g. tonnes/day) and the duration (e.g. allowing for well interventions to halt leaks or self-healing of fractures within a primary seal).

Unless or until site-specific data become available (e.g. using the methods proposed in ongoing research, such as Ref. 5), the challenge is to make generic data site-specific, and then to extrapolate the financial impact. As a first approximation, developing a simple event tree for each scenario is very useful for both aspects, with an example event tree shown in Figure 3. An expanded version of Figure 3 is shown in Ref. 6.

## GROWING THE TREE

The event tree's initiating event frequency allows for site-specific and time-dependent estimates to be included, such as:

- The number of legacy wells.
- The frequency of planned well interventions each year, or
- The varying likelihood of primary seal leakage as pressure within the store changes throughout the injection period and post-closure

The nodes of the event tree also allow site-specific features to be added (e.g. the presence of secondary seals, the proximity of legacy wells).

Each accident sequence (route through the event tree) generates a data point of likelihood and total mass of CO<sub>2</sub> released. To each of these we can add sequence-specific cost estimates, such

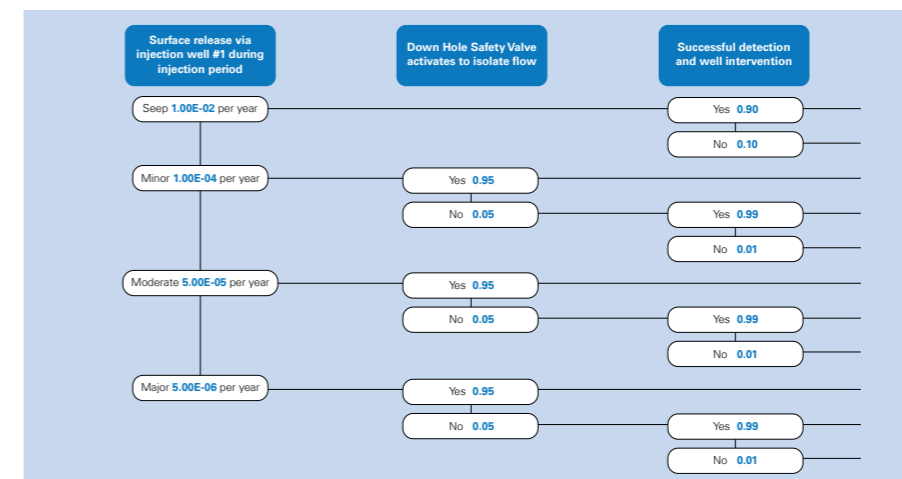


Figure 3 - Example of a simple Event Tree

as for repairs/replacements, increased monitoring following a release, well intervention/remediation, and the 'lost' cost for each tonne of CO<sub>2</sub> released.

## OUTPUT

All event tree outcomes can be enumerated on a yearly basis for the period of interest, enabling yearly exceedance curves to be calculated (e.g. as shown in Figure 1). By multiplying the frequency by the mass/cost, an expected mass/cost per year can also be calculated, and then summed over the lifetime of the project to give a cumulative quantitative risk.

Given the amount of expert judgement and inherent uncertainty involved in the analysis, sensitivity studies are advisable. It is also possible to compare results to the equivalent for conventional operations (e.g. hydrocarbon safety risk liabilities), and the published values for a typical CCS project – for instance, the Zero Emissions Platform (ZEP) calculated the annual expected cost for a project to be around €850k [Ref. 3].

## CONCLUSION

It is possible to repurpose standard quantitative and semi-quantitative safety risk analysis methods, coupled with data from relevant literature, to estimate site-specific CO<sub>2</sub> leakage rates and calculate insurance liabilities covering the entire CO<sub>2</sub> value chain of a CCS project, from capture through to storage.

Although operational experience is scarce, there are some useful sources of data, but expert judgement needs to be applied to produce meaningful analysis results.

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# Clear Views Ahead – How an app can help share safety-critical information

While the sharing of relevant information from a Health, Safety, Security and Environmental (HSSE) case with wider stakeholders, such as bowties with a workforce, is clearly desirable, it has always proved a challenge. How can we provide the right people with easy access to the right information at the right time? With the rise in the ubiquity of smart phones and apps, however, we ask is now the time to utilise these tools?

## INTRODUCTION

Anyone familiar with a HSSE case or bowtie diagram will appreciate the volume of useful information they contain. Embedding the understanding they convey in day-to-day operations is often challenging and simply providing copies of the HSSE case may ultimately leave operators wondering, "How does this apply to me?" and "How do I access relevant information?"

Typically, facility operators will have been involved during the development of the HSSE case – for example, participating in hazard identification workshops or reviewing output. This approach has the benefit of avoiding 'paper-based' safety, so that the HSSE case reflects what is actually happening at the facility rather than what office-based people think is happening. But in practice only a small fraction of the total workforce is likely to be involved during this development stage. While sharing the understanding of hazard scenarios and their prevention with the wider workforce is obviously beneficial, what's the best way of achieving this goal?

## VALUE-ADDED SHARING

When we need to 'operationalise' HSSE cases by sharing it with the front line organisation, simply asking everyone to plough through reams of content is unrealistic and doomed to failure. Similarly, a handful of Powerpoint slides is unlikely to achieve any lasting effect.



Figure 1 - Example Risktec Viewer screenshot

In order to truly operationalise an HSSE case, we need to provide:

- The right information
- To the right people
- At the right time
- In the right way

What a technician needs to be aware of, understand or work with is quite different with that of a production supervisor, which again will be different from that of an asset manager.

Effective safety management involves both an understanding of hazards and being able to access relevant safety-related information quickly and easily for the task at hand, such as up-to-date procedures or maintenance schedules.

Everyone needs to be able to see the full picture, but also needs to be able to tailor what they see to be relevant to them.

## A TRADITIONAL APPROACH

Posters, leaflets, presentations and Q&A sessions are simple and effective methods to increase awareness; safety-critical role booklets and user-friendly, targeted copies, extracts or summaries of an HSSE case are all useful tools to advance understanding.

These can of course be effective, but the ubiquity of mobile devices, coupled with a growing familiarity and expectation from individuals that information be available digitally in their pocket, provides an opportunity to share information in a new and immediate way.

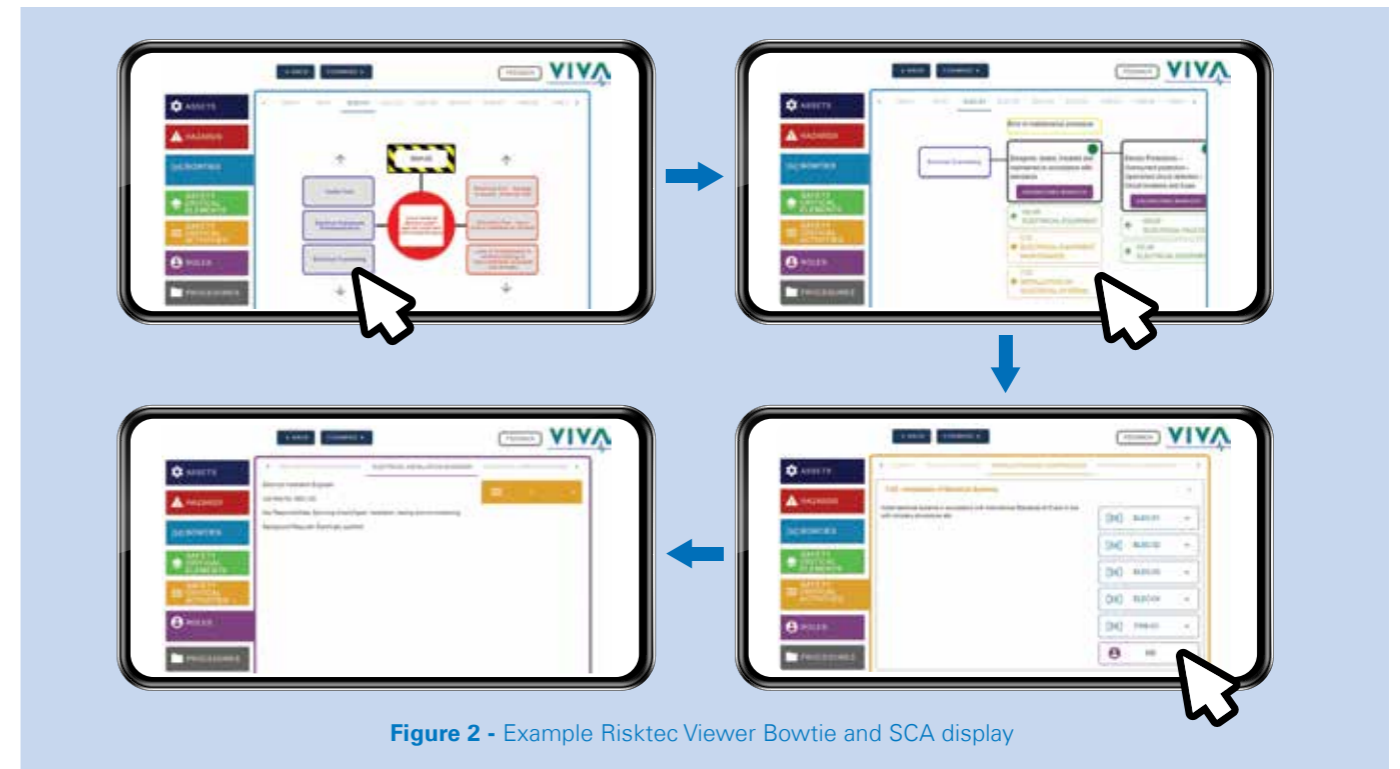


Figure 2 - Example Risktec Viewer Bowtie and SCA display

## AN APP BASED APPROACH

A mobile-friendly app-based solution is one way to modernise the operationalisation of HSSE cases. The Risktec Viewer is an example of an interactive tool that allows you to view key elements of your HSSE case (or similar documentation) in a mobile-friendly environment. The information presented is taken from the HSSE case in question and can typically include:

- Hazards
- Bowties
- Safety Critical Elements (SCEs)
- Safety Critical Activities (SCAs)
- Roles
- Procedures

The key difference from a traditional paper-(or pdf-)based HSSE case is that the Viewer provides an interactive and user-friendly platform, which uses eye-catching, clickable links as a means of connecting and navigating to related information.

For instance, when viewing a bowtie, each barrier displays the associated SCEs, SCAs and any linked roles and procedures. If a user wants to find out more information about an SCE or SCA, the associated task description or other bowties it is linked to, they simply click on the SCE/SCA.

If a person with a particular role wants to see what barriers or SCAs are assigned to them, they simply click on their role under the 'Role' tab, and all SCAs assigned to them are displayed. The SCAs are clickable, with the user able to then track them to where they appear on the bowties.

This interactive method of navigating through the Viewer also applies to all other elements displayed – everything is clickable and shows all the linkages.

## HOW DOES THE APP WORK

The Viewer can be displayed on a normal PC, tablet or mobile phone. Enabling the use on mobile phones in particular allows the Viewer to be shared with all relevant personnel within an organisation. This means that everyone has permanent access to all the information relating to the management of hazards, the role they play and what is expected of them – and they can carry this with them.

Information can be accessed in a live environment, such as a tool box talk or before a job starts, in order to really highlight the barriers, SCEs, SCAs and procedures relevant to a particular hazard, allowing everyone to see a complete picture of the

risk and how that risk should be managed.

There is also the potential to see the live status of barrier effectiveness, giving a real-time view of the overall risk management position for individual threats, hazards, or facilities as a whole.

## CONCLUSION

While challenging, operationalising HSSE cases could deliver a step change in workforce hazard understanding and management. Fortunately, mobile technology is now sufficiently advanced, widespread and accepted by society that it offers a genuinely practical solution – allowing personnel to access the information they need when they need it, and in a searchable and personalised environment.

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# Career Portraits – Life as a Risktec consultant

As Risktec continues to grow, we thought it would be interesting to interview some of our staff to discover their journey so far. Here we share the stories of three very different members of our team at varying stages in their Risktec careers and ask what advice they would like to pass on.

## WHAT DID YOU DO BEFORE JOINING RISKTEC?

I studied Chemical Engineering at the University of Manchester, which was quite challenging but very rewarding in retrospect. It's helped a lot with

understanding the process of a HAZOP workshop and scribing. Before joining Risktec I actually worked in the pension industry as a software consultant; a departure from my degree, but I accepted what I could at the time and it helped me grow as a person and increase my self-confidence by learning something completely new.

## HOW DID YOU FIND OUT ABOUT RISKTEC?

I've always had an interest in the safety aspect of engineering and understanding that everything can be dangerous in certain conditions. I had a friend who worked at Risktec at the time of applying who spoke highly of the company and explained to me the type of work Risktec do. Risktec seemed like a perfect fit and I am grateful for that.

## FAVOURITE OR MOST MEMORABLE EXPERIENCE AT RISKTEC?

It's hard to pick just one, but attending my first HAZOP workshop on site was definitely memorable. Being exposed

to the years of professional experience within the room and seeing first-hand the discussion of a real project, with the aim of making it safer for people and for the environment. It is quite humbling but also a really cool experience.

## WHAT ARE THE MAIN THINGS YOU LIKE ABOUT WORKING FOR RISKTEC?

One of the main things that stands out to me is the amazing culture and working environment. The people I work with are positive, honest and always willing to help out. I appreciate the opportunity to develop my network within the company with various offices but also to be able to learn so much from my colleagues.

Another plus is being a part of the MSc Risk and Safety management course offered by Risktec, which is something I knew I couldn't pass up. Already I'm finding it incredibly valuable for my day-to-day work and am excited to see how the course will continue to increase my skills in the years to come.



**Zaid Hamoodi**

**GRADE:** Graduate Consultant  
**LOCATION:** Warrington  
**JOINED RISKTEC:** 2022  
**HOBBIES:** Playing sports, reading, gaming, plane spotting



**Clare Parker**

**GRADE:** Principal Consultant  
**LOCATION:** Derby  
**JOINED RISKTEC:** 2019  
**HOBBIES:** Family bike rides, qualified yoga instructor, trying new foods

## WHAT MADE YOU WANT TO BE A CONSULTANT?

I had spent the vast majority of my career working for large manufacturers and was never involved in the commercial aspects of winning work and constructing bids. I had reviewed plenty of bids and worked

with consultants a lot over the years, and the idea of working across different projects and industries really appealed to me to broaden my knowledge and skills in both Human Factors (HF) and consultancy.

## WHAT DOES A TYPICAL WEEK LOOK LIKE FOR YOU AT RISKTEC?

I work part time, three days a week (Tues to Thurs). Tuesdays are my meeting-heavy days where I catch up on what's happened while I've not been working, touch base with my office team and project teams, and generally do project work during the afternoon. I've recently taken on a more prominent business development role so part of my working week is to speak with the rest of the HF team to understand what opportunities for new work are out there and what networking or marketing events we should be attending to meet potential clients and raise the profile of Risktec's HF capability.

## FAVOURITE OR MOST MEMORABLE EXPERIENCE AT RISKTEC?

There have been many memorable experiences at Risktec but I guess the most memorable is presenting at my first conference. My manager had to present his paper early morning with mine being one of the last. Rather than leave after his presentation he stayed and was in the front row for my turn. The support he showed gave me the confidence to do something massively outside my comfort zone. That level of support from managers is something that I have come across on many occasions but that is one of the turning points in my personal development.

## 3 THINGS YOU HAVE LEARNED WORKING AT RISKTEC?

Only three things? Other than the obvious working knowledge, I suspect the main learnings I have had from a career perspective are empathy for colleagues, project management skills and to trust my own abilities (although I still have a lot to learn on one or two of these!).

## WHAT ARE THE MAIN THINGS YOU LIKE ABOUT WORKING FOR RISKTEC?

Risktec treats staff very well – flexible working, variety of work, and good colleagues all make the working environment something to look forward to. But I think the main thing about working here is the empowerment you feel. The Risktec business model both empowers us and makes us accountable for our actions – and that allows us to push the boundaries of the work we do and challenge ourselves to improve and innovate.

## IS THERE ANYTHING ELSE YOU WOULD LIKE TO MENTION ABOUT YOUR CAREER/WORKING AT RISKTEC?

I have been lucky enough to live in some great places while working for Risktec (UK, Middle East and South East Asia). Living overseas is a great experience with many interesting challenges, such as different cultures, different foods and driving on the wrong side of the road! My work at Risktec has also taken me to some inhospitable places, but the company has always made sure I am safe and have never asked me to go anywhere that I am not comfortable to go to.



**Mike Bates**

**GRADE:** Principal Consultant  
**LOCATION:** Edinburgh  
**JOINED RISKTEC:** 2006  
**HOBBIES:** Watching F1 motorsport, hill walking, DIY projects

## WHAT GOALS DO YOU HAVE FOR THE FUTURE?

I have lots of goals and things I'd like to achieve in the future. I'd love to land the HF team a rail client, and I'm also really interested in getting HF into the clean energy sector. This aligns with my morals as a keen environmentalist, so combining two things I'm passionate about would be really exciting. A big challenge for me this year is being the HF module lead for Risktec's MSc – I'm really looking forward to learning how to write exam questions, deliver virtual classrooms and mark my students' output!

## WHAT ADVICE WOULD YOU GIVE SOMEONE WHO IS CONSIDERING A CAREER IN CONSULTANCY?

Consultancy is ever changing and quite fast-paced so you need to keep your wits about you. The diversity of work, both across different industries and across the multitudes of tasks, is great for developing a wide range of skills and keeping interest levels high.

As a general statement, I think Risktec is a good company to work for. I started with the company as a Senior Engineer and progressed through to running an office in Malaysia – career progression is there if you want it, but the drive has to come from you.

## COMING SOON

Look out for the expanded Q&A with Zaid, Clare and Mike, as well as Q&As with some of our other team members, on the updated Risktec website which is coming soon!

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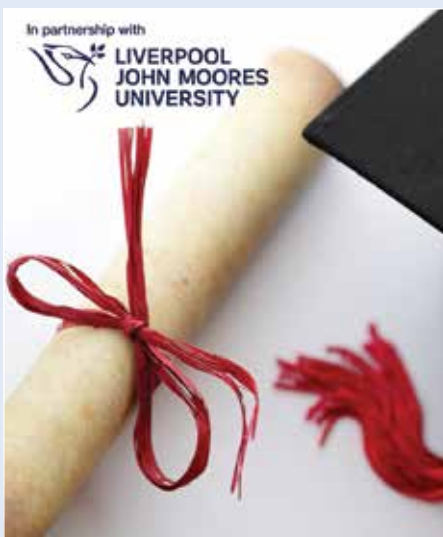
### MSC STUDENT OF THE YEAR DAVID MCVEIGH

My background is in chemical engineering with many years' experience in food, pharmaceutical and chemical process industries. My current role covers the risk management areas of process safety, machinery safety and loss prevention working across global projects, based in Cork, Ireland.

I've found the Risktec/LJMU MSc programme in Risk and Safety Management highly engaging, educational, and relevant. The course covers current topics and methodologies such as safety culture, human factors, bowties, risk analysis, management systems, incident investigation, modelling, crisis management and more, addressing hot issues across the industrial spectrum from the circular economy to, aviation, nuclear, oil and gas etc.

The course tutors are very helpful, providing guidance and stimulating enquiry. The modular and flexible self-paced format enables working full time while engaging with the course materials. While it can be demanding at times, overall, the programme is reasonably paced.

The course has given me a level of competence and confidence in the area of risk management that I would not have had otherwise.



### POSTGRADUATE PROGRAMME 2023

Places are available on the Risktec MSc in Safety and Risk Management awarded by Liverpool John Moores University which starts in October of this year.



### DEALING WITH UNCERTAINTY IN QUANTITATIVE RISK ASSESSMENT: A CCS CASE STUDY

Effective risk-based decision making relies on an accurate characterisation of the likelihood and severity of possible outcomes. But what if there is no track record?



### BARRIER MANAGEMENT – DRIVING PROCESS SAFETY IMPROVEMENT

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