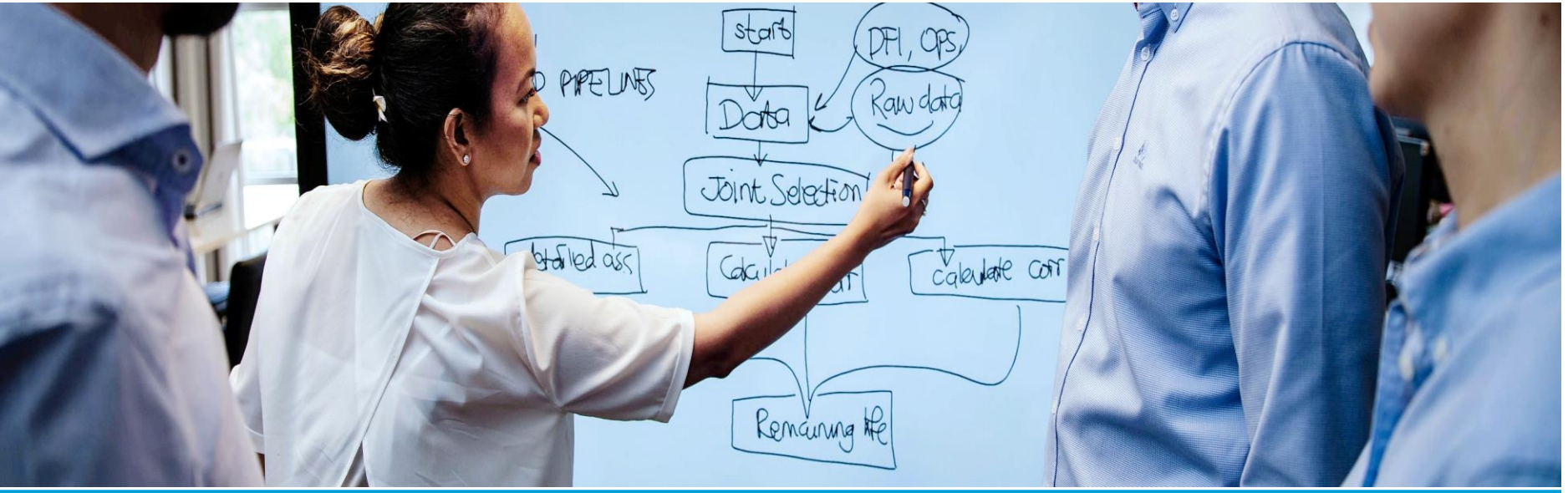


ENSURING CRITICAL KNOWLEDGE AND LEARNING IS RETAINED FOR RE-USE ACROSS GENERATIONS

Content

01 About DNV GL

DNV GL: Global reach – local competence

150+
years

100+
countries

100,000+
customers

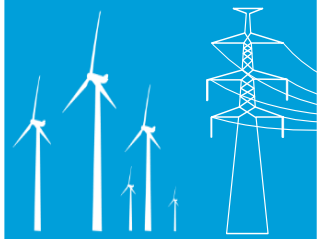
12,500
employees

Our vision: global impact for a safe and sustainable future

MARITIME

OIL & GAS

ENERGY



BUSINESS ASSURANCE

DIGITAL SOLUTIONS

TECHNOLOGY & RESEARCH

02 The challenges

Too good to be forgotten

- In a 2004 speech at NASA Headquarters in Washington, D.C., George W. Bush said that the "new course for America's space program would give NASA a new focus and clear objectives for the future.
- We do not know where this journey will end," said Bush, "yet we know this: Human beings are headed into the cosmos'

David DeLong (2004)


O&G


Nuclear


Steel


Mining


Infrastructure


Energy

03 Our experiences

Retention of critical knowledge for Rijkswaterstaat

CUSTOMER CHALLENGE

Rijkswaterstaat, a Directorate within the Dutch Ministry of Infrastructure and the Environment, is in charge of Public Works and Water Management. Rijkswaterstaat is responsible for the sustainable development and maintenance of the national system of roads and waterways.

The Directorate has an annual budget of over €2 billion and employs more than 9,000 highly experienced and uniquely skilled professionals. The average age of the employees is relatively high, and consequently the organization is facing a huge risk of losing exceptional experience and expertise through retirement and job changes.

Photo credit https://beeldbank-rws.nl, Rijkswaterstaat

DNV GL SOLUTION

- DNV GL was asked to provide a methodology to enable facilitators and line managers to effectively manage a knowledge-retention process.
- Rijkswaterstaat and DNV GL co-developed a six-step methodology with supporting tools to assess and identify critical knowledge; plan and execute the knowledge transfer; and validate that knowledge was retained and reusable.

OUTCOME AND BENEFITS

- The methodology and supporting toolbox were piloted and validated with the customer and then documented and bundled into the "Knowledge Survival Kit" – a handbook for line managers and others.
- Rijkswaterstaat has deployed the "Knowledge Survival Kit" and embedded the competencies needed internally.

CASE STUDY

The right knowledge at the right time

CUSTOMER CHALLENGE

SGN is a gas distribution company managing a network that distributes natural and green gas to 5.9 million homes and businesses across Scotland and south England.

SGN is facing challenges associated with the potential loss of knowledge due to experts retiring or leaving. New recruits lack SGN-specific experience and knowledge of operations and assets. Currently, a small number of subject-matter experts hold critical knowledge. Knowledge of localized, sporadic, obscure and non-routine issues is held by a few people and not easily found by others. Ensuring that the right knowledge is available at the right time is essential to successfully fulfilling SGN's strategic goals.

Photo credit Getty Images

DNV GL SOLUTION

- DNV GL and SGN have a long history of collaboration and DNV GL was asked to make recommendations for a critical knowledge retention programme. The roll-out recommendations were based on two typical scenarios which may lead to the loss of knowledge.
- DNV GL managed two pilot projects to demonstrate how knowledge can be captured, retained and shared for re-use.
- One pilot deployed a range of tools that we have developed to help capture and share the knowledge held by an individual expert.
- The other pilot focused on the asset knowledge at a specific SGN site and made several videos in which experts narrated their knowledge of individual mechanical and electrical assets and site-specific issues relating to access, safety and security.

OUTCOME AND BENEFITS

- The expert's knowledge was captured by creating maps of his professional network, a list of frequently asked questions, some top tips for colleagues and a series of short videos made during presentations to colleagues.
- In the videos focused on the assets, local experts shared their knowledge about atypical issues, non-standard maintenance routines as well as access and safety matters.
- DNV GL has created prototypes of a knowledge retention portal that will help SGN to disseminate and reuse the results.
- The knowledge retention roadmap created by DNV GL sets out a vision of how SGN can embed the program into its management system.

CASE STUDY

Identify and retain critical knowledge

CUSTOMER CHALLENGE

The Nuclear Decommissioning Authority (NDA) is the government agency responsible for the safe and effective decommissioning of the UK's civil nuclear legacy. The NDA plays a strategic role in implementing government policy, managing 17 sites and ensuring it has the right skills and resources to fulfil its mission. The industry in the UK has an ageing workforce and the NDA needs to take a robust approach to retaining the knowledge it needs and ensure it leads the industry in innovative ways to address this issue.

Photo credit Magnox Ltd

DNV GL SOLUTION

- DNV GL has created a tool for the NDA to identify critical knowledge, and has validated the tool in pilots with some key NDA departments.
- DNV GL piloted an approach to knowledge retention at the NDA's largest and most complex site and has subsequently supported the NDA in implementing an enhanced version of that approach within its organization to help inform and influence the industry more broadly.
- The approach has two elements. Firstly, a web-based application was designed to help assess the potential risk of knowledge loss across NDA staff. Secondly, the NDA knowledge management team was coached in methods to capture and transfer knowledge in a number of pilots.

OUTCOME AND BENEFITS

- The NDA is now able to identify its critical knowledge and review its approach to managing that knowledge for the benefit of its mission.
- The NDA has a robust risk assessment programme, can identify where any potential vulnerabilities may lie in terms of knowledge availability over the short to medium term and can deal with those risks proactively.
- The NDA has developed a toolkit for supporting knowledge capture and transfer that includes audio-visual methods as well as knowledge maps and digital knowledge 'bytes'.

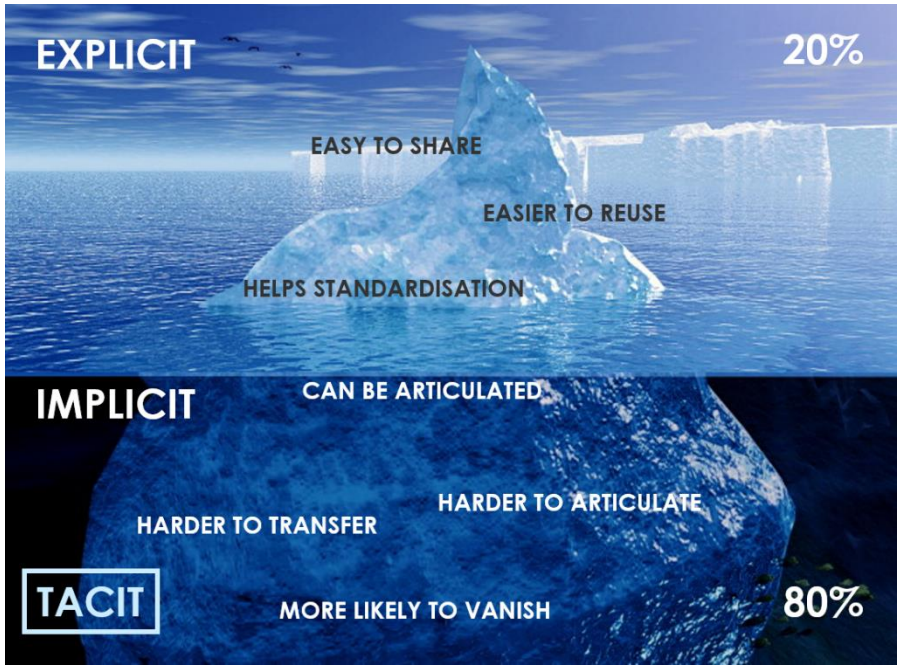
04 Focus

Knowledge transfer across generations

- Nuclear decom strategy
  - Magnox sites to be 'mothballed' for 80 years prior to decom
  - Sellafield end state by 2125

Reducing risks

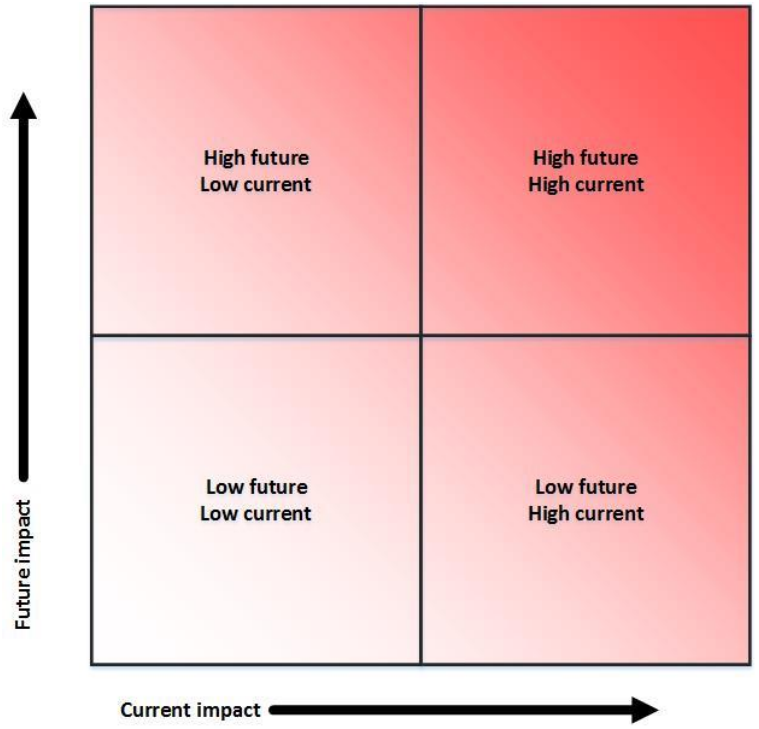
- Planning to ensure robust knowledge management across:
  - People, assets and projects.
  - The transition between operations (late life planning), decommissioning, dismantling and scrapping.
  - All stakeholders, suppliers and contractors (including supply chain).



Critical knowledge including lessons learned

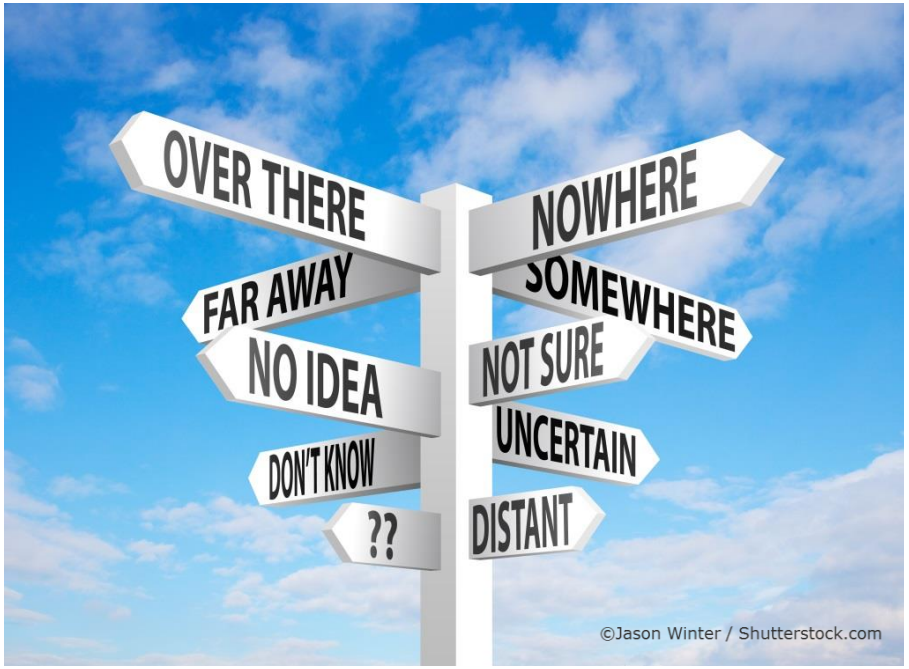
Table 3- Current & Future Impact of Knowledge Areas

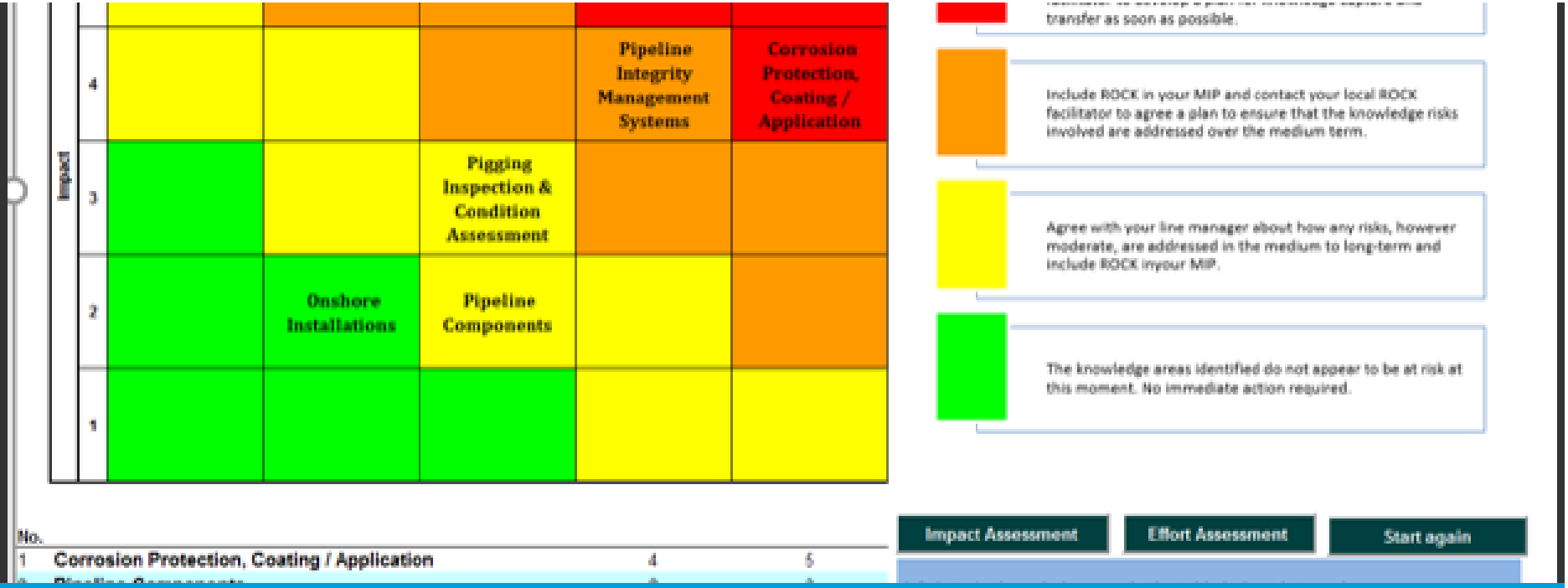
	Knowledge Areas	Current Impact	Future Impact
		Sort	Sort
2	Policy	10	10
3	Strategy Development	10	10
5	Waste Data	10	10
6	Radwaste Programmes (SLCs)	9	7
4	Strategy Implementation	8	10
1	Good Practice	6	7
7	Liquid & Gaseous Discharge	5	7
8	Non Radioactive	5	5



Ignoring the risks will have its own costs

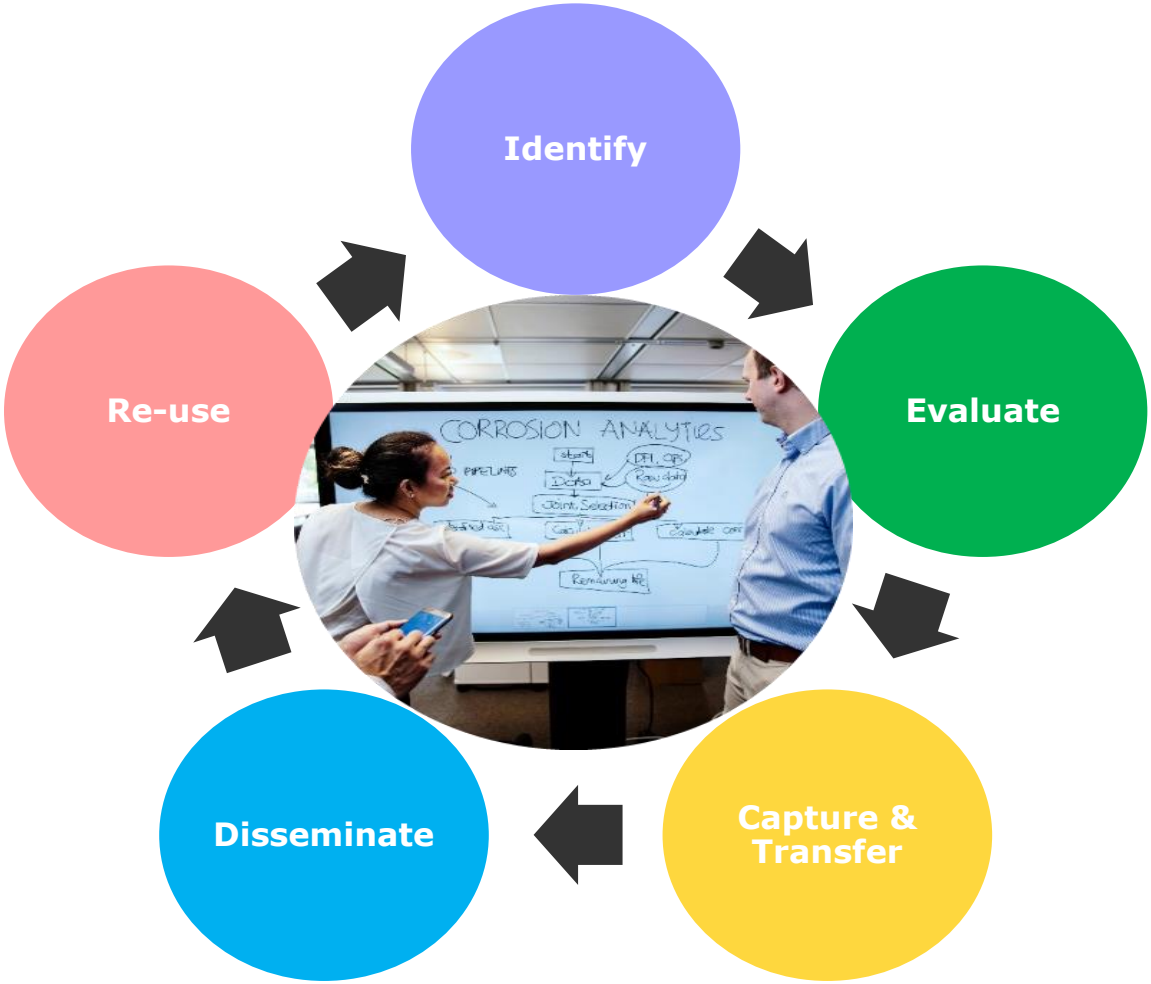
1. Costly mistakes are duplicated because earlier ones were not recorded or analysed
2. Work is redone because people are not aware of activities, projects in the past or their outcomes
3. Customer relationships are damaged because knowledge is not available at the point of action
4. Good ideas and best practices are not shared which raises overall costs
5. 1 or 2 key employees hold crucial knowledge
6. The company learns too slowly which results in delayed product development or missed opportunities
7. Employees are frustrated because knowledge resources are not available



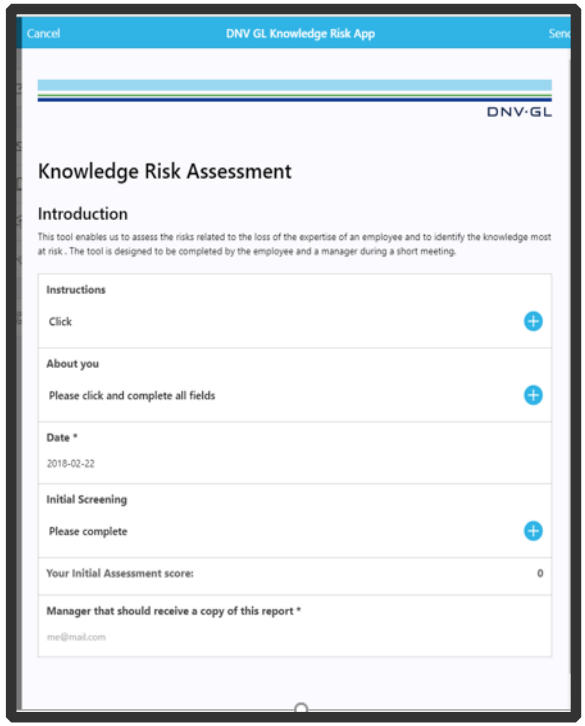


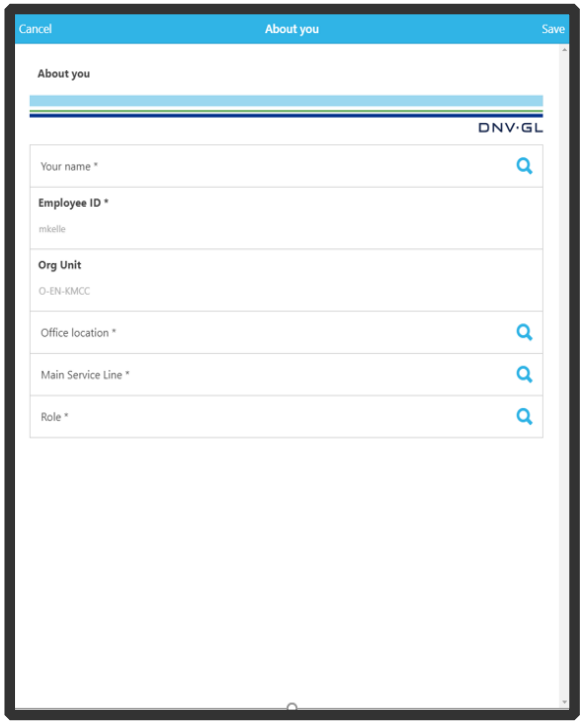
05 Robust approach

Addressing the risks needs a robust approach

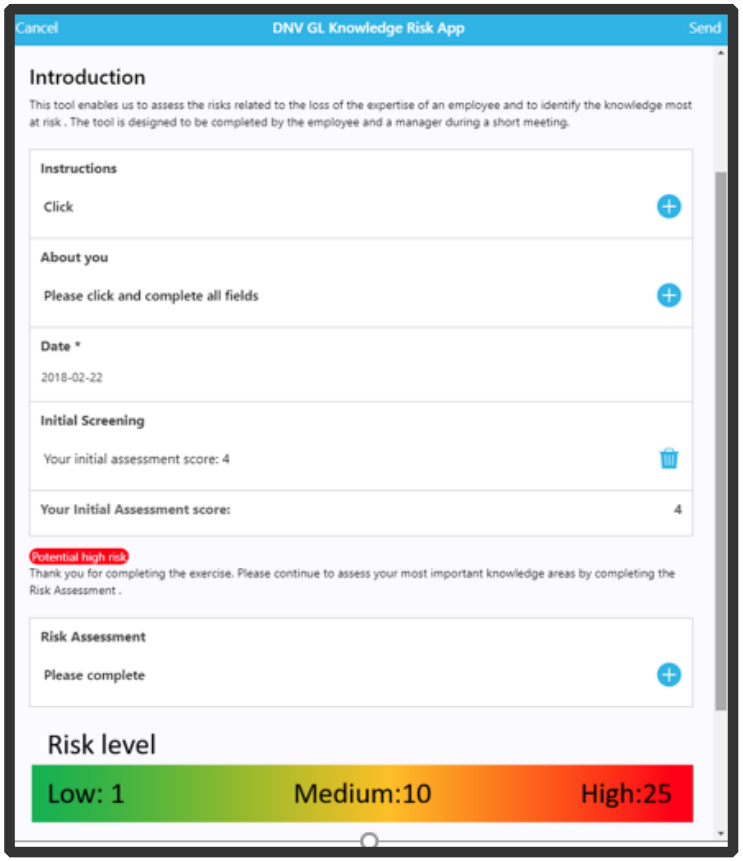


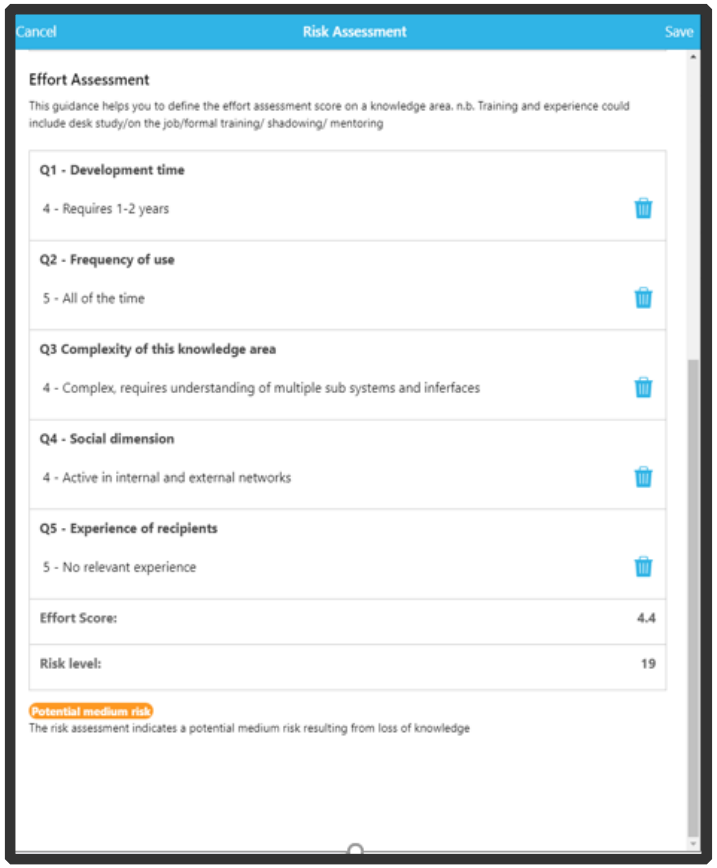
Identify and evaluate



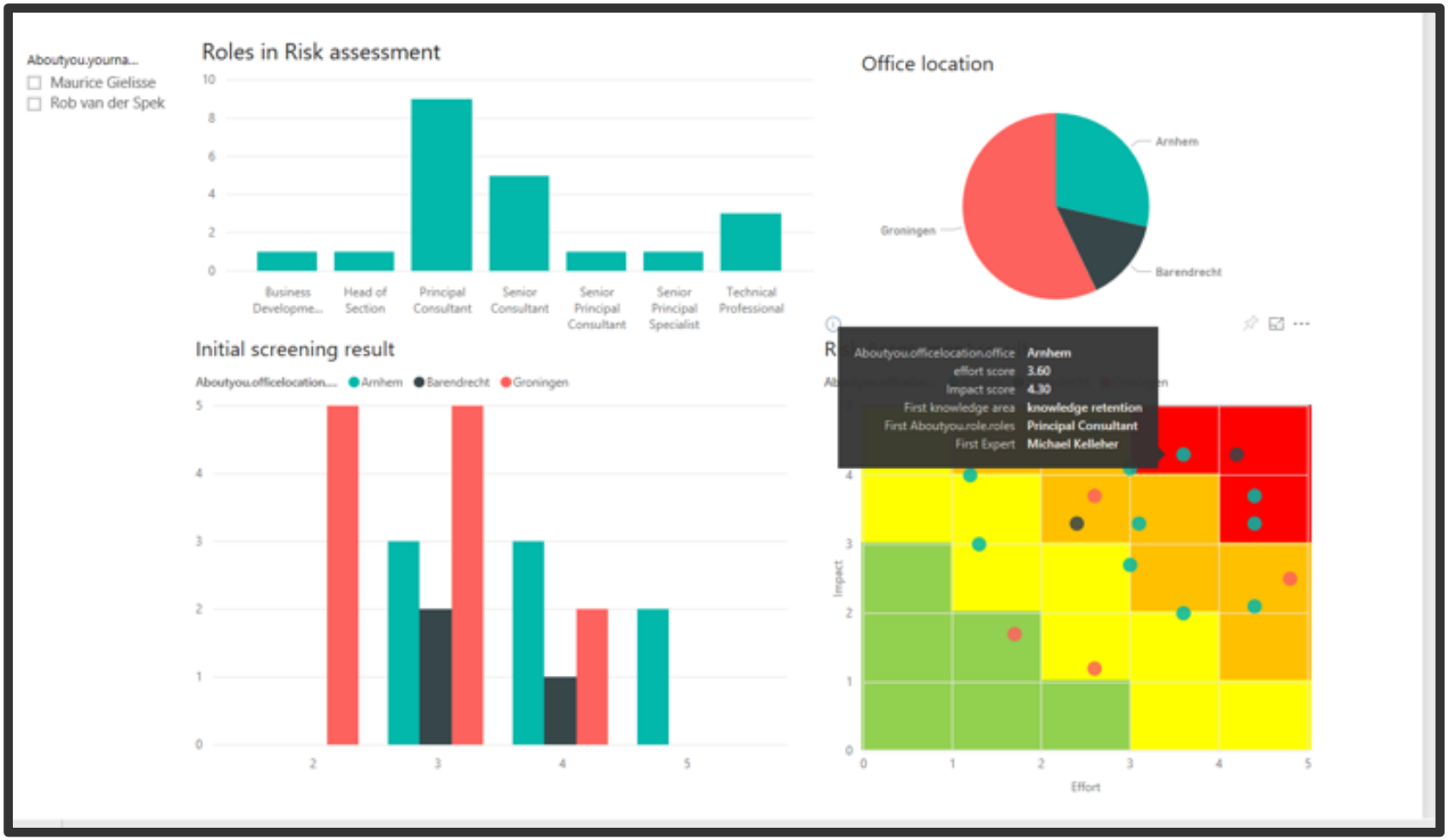


Impact vs Effort

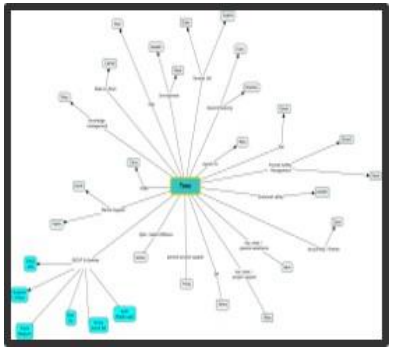




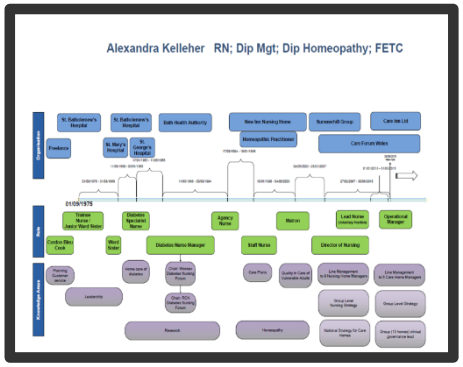
Evaluate



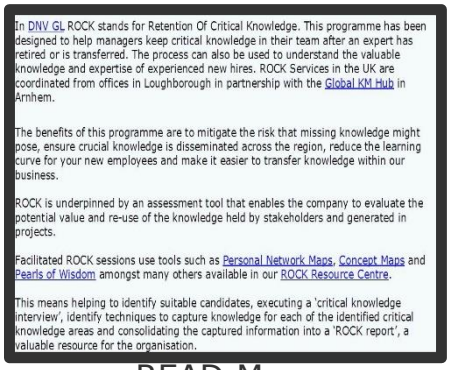
Capture / transfer the knowledge: people



Personal Network Map



Career Map



In DNV GL ROCK stands for Retention Of Critical Knowledge. This programme has been designed to help managers keep critical knowledge in their team after an expert has retired or is transferred. The process can also be used to understand the valuable knowledge and expertise of experienced new hires. ROCK Services in the UK are coordinated from offices in Loughborough in partnership with the Global KM Hub in Arnhem.

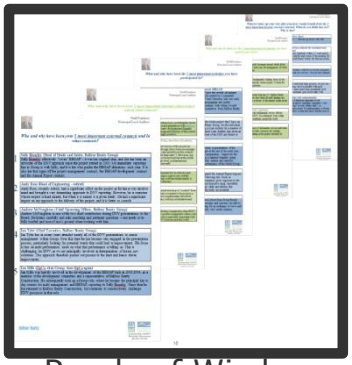
The benefits of this programme are to mitigate the risk that missing knowledge might pose, ensure crucial knowledge is disseminated across the region, reduce the learning curve for your new employees and make it easier to transfer knowledge within our business.

ROCK is underpinned by an assessment tool that enables the company to evaluate the potential value and re-use of the knowledge held by stakeholders and generated in projects.

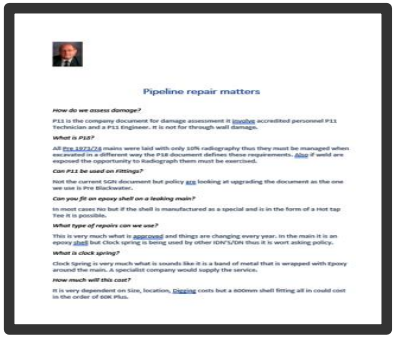
Facilitated ROCK sessions use tools such as Personal Network Maps, Concept Maps and Pearls of Wisdom amongst many others available in our ROCK Resource Centre.

This means helping to identify suitable candidates, executing a 'critical knowledge interview', identify techniques to capture knowledge for each of the identified critical knowledge areas and consolidating the captured information into a 'ROCK report', a valuable resource for the organisation.

READ Me

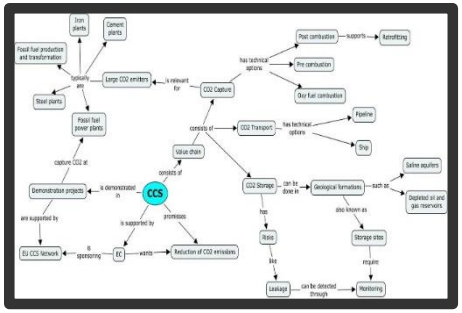


Pearls of Wisdom



FAQs

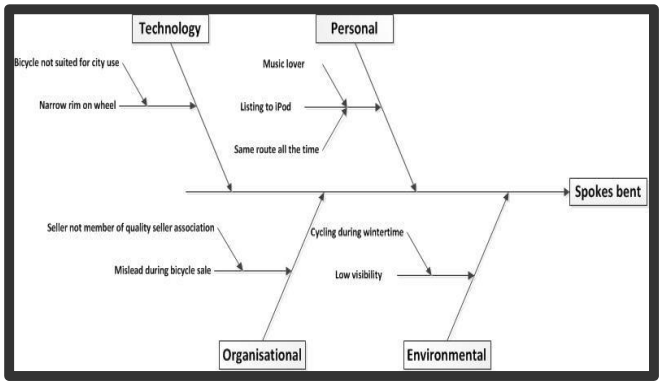
An Audience With



Concept Map

Peer Assist

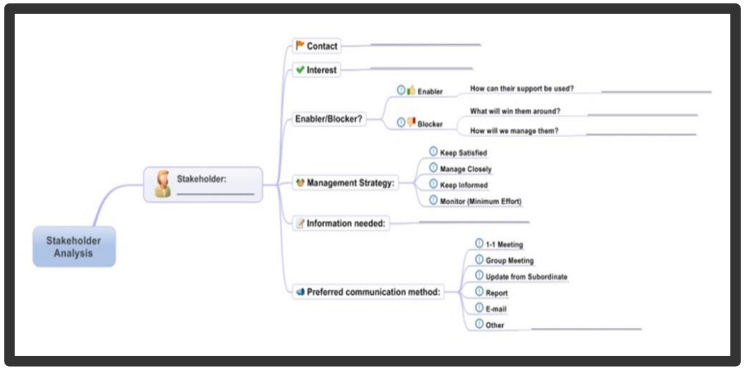
Capture / transfer the knowledge: assets



Causal Mapping

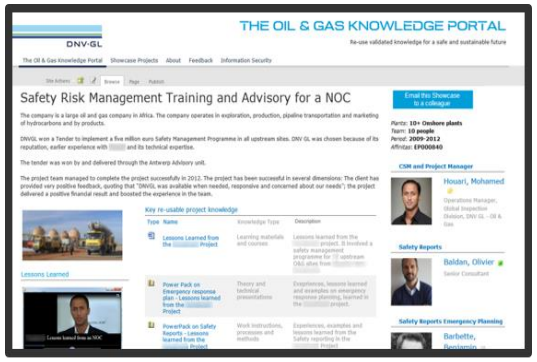
Plant Walkdown

Asset Map



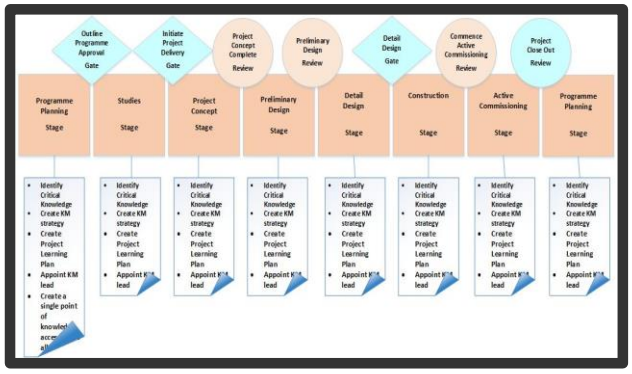
Stakeholder Mapping

Capture / transfer the knowledge: projects



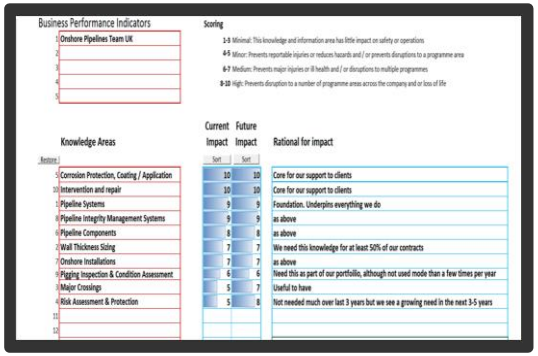
Project Showcase

Knowledge Markets

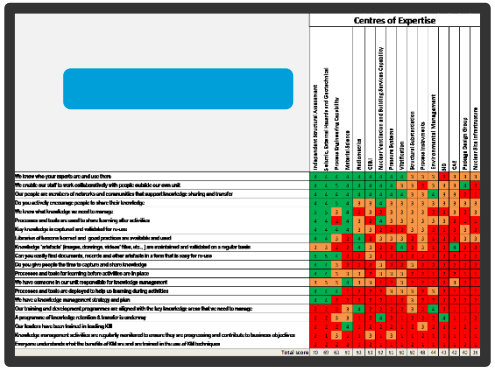


Gated Process Knowledge Risk Plan

Sharing Events



Knowledge Health Checks



Sharing Dashboard

Disseminate & re-use

- A library of re-usable knowledge assets as a single point of reference ensuring that they are structured meaningfully for users to easily find and re-use them.
- There are technical and governance features to a library.
  - Technical relates to the organisation of the knowledge assets, their fields in the library and their focus.
  - Governance relates to the degree to which the assets are reviewed, maintained, validated, classified, analysed and disseminated

Example from the gas distribution industry

VeriGas

VeriGas Knowledge Retention Portal

Reuse knowledge for a safe and sustainable future

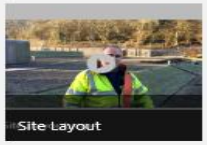
Key Contacts

Mike Kelleher
Area Manager
P: +44 12345 5678
M: MKelleher@GasDistributionco.uk

About

Tumblehill is the largest network node in West Alicia

Selected Asset Videos



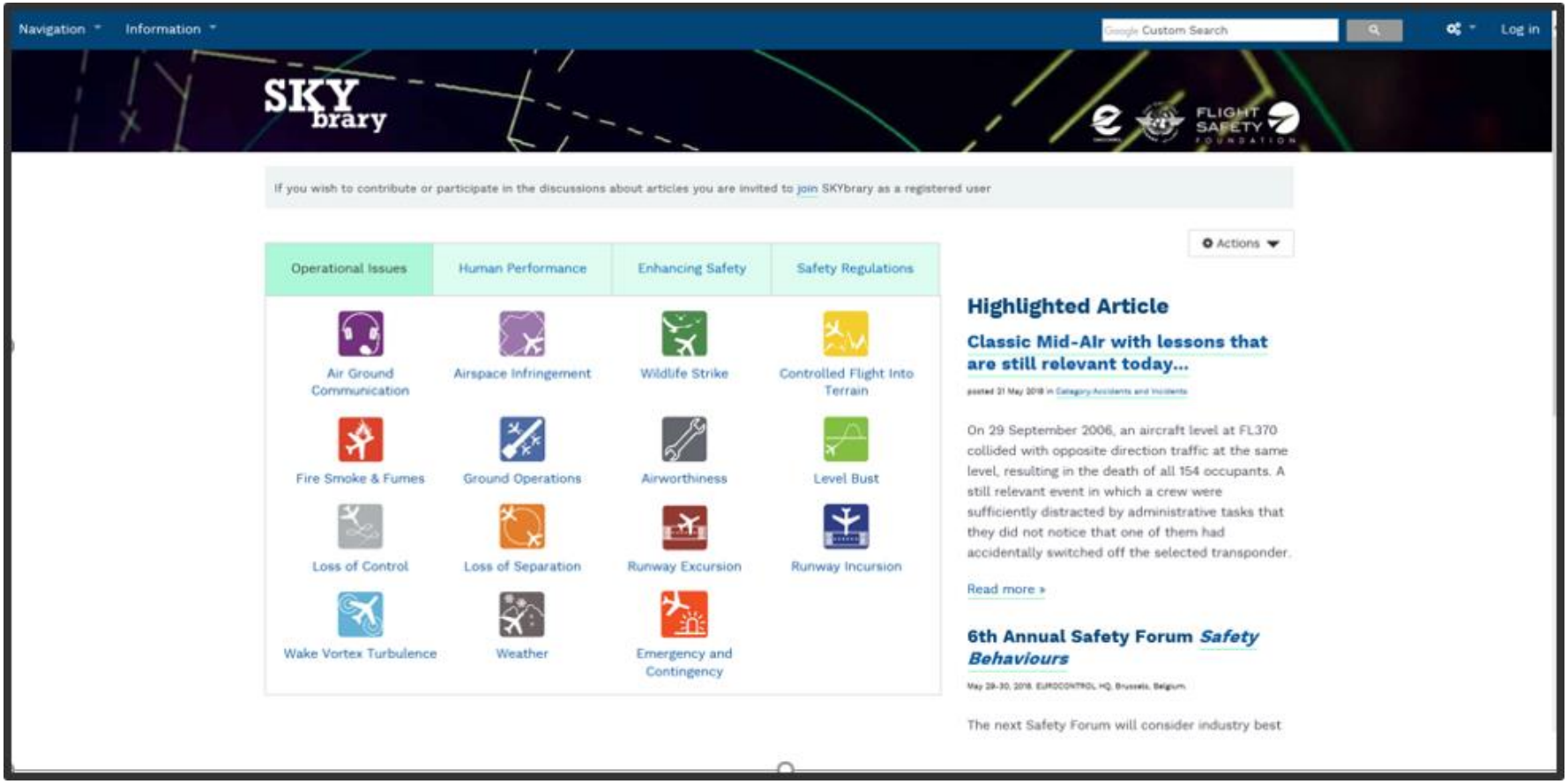
View all asset videos >>>

Knowledge Documents

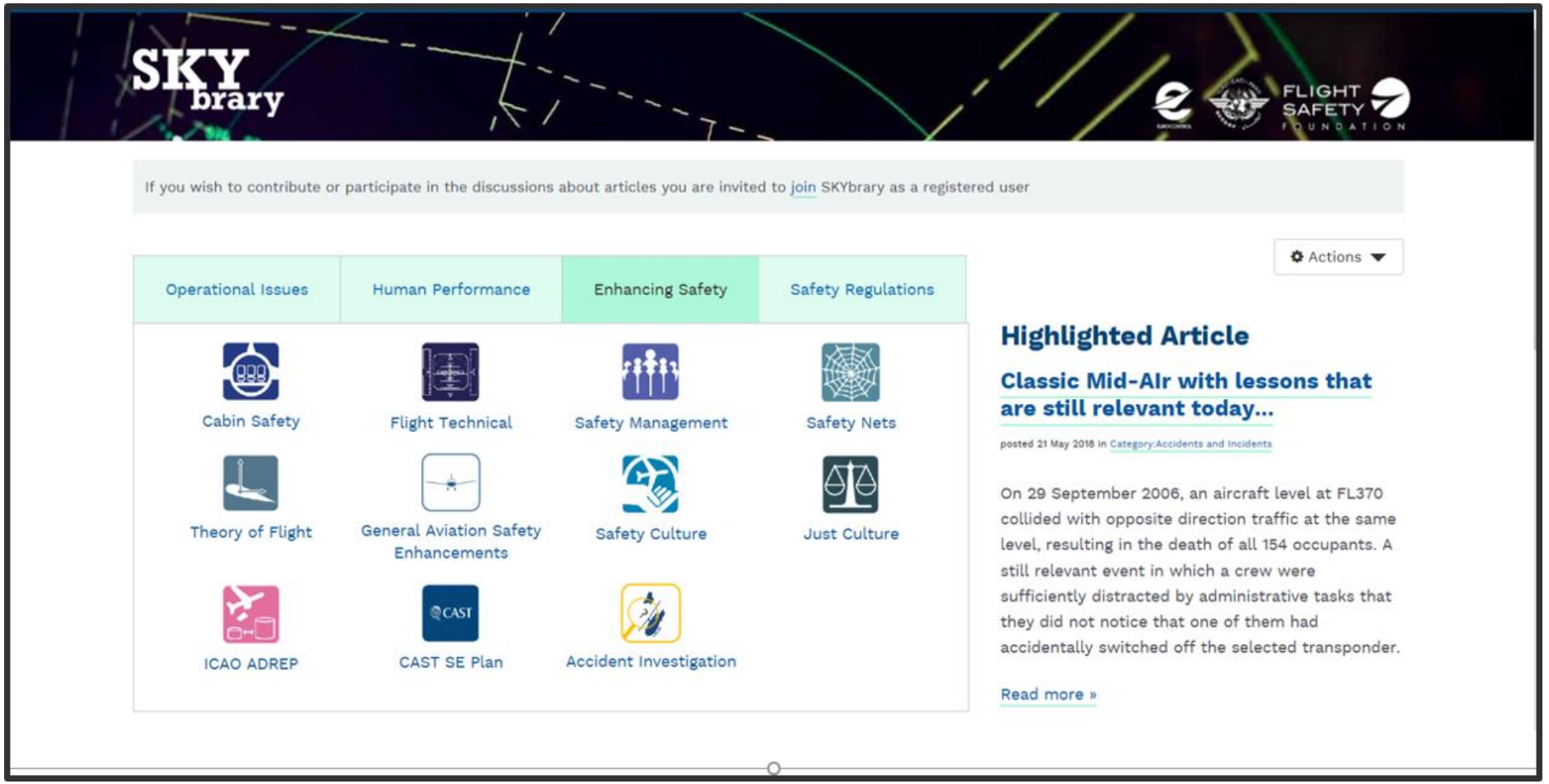
Name K-type Keywords

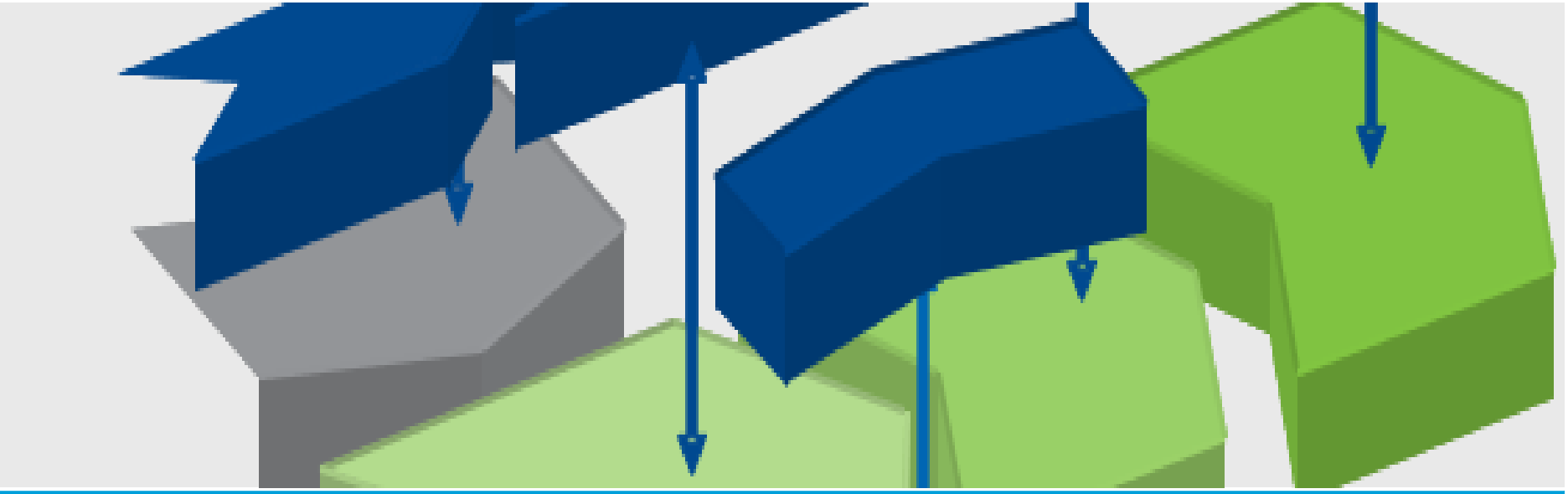
- Asset : (11)
- Asset : Boiler house (6)
- Asset : Control room (2)
- Asset : Electrical supply (2)
- Asset : Filters (1)
- Asset : Heat exchanger (1)
- Asset : Odorant injector (2)
- Asset : Orifice plate (2)
- Asset : Panic gates (1)
- Asset : Pipeline (1)

Example from aviation industry



Skybrary

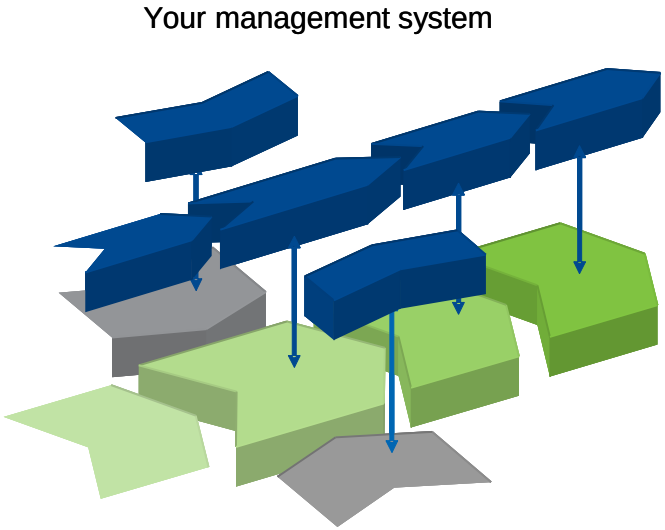




06 KM & Management Systems

Integrating knowledge management into your management systems

- Reviewing your existing management system should be one of the first key steps you should take to improve knowledge risk management in your organisation.



Framework

IDENTIFY & EVALUATE

Organisational Units
Individuals
Assets
Projects

REVIEW CONTROLS

Store documents
Find documents
Documenting new knowledge types
Find expertise
Create new knowledge
Retain knowledge
Validate knowledge
Learning in the value chain

KM ENABLERS

Leadership & Governance
Cultural Change
Compliance
IT Infrastructure

Knowledge Risk Management

07 Critical success factors

To ensure that critical knowledge is retained for re-use across generations

- Plan to treat knowledge as an asset so that its is managed effectively
- Use the rights tools for the type of knowledge;
- Take care of your tacit knowledge. It really is the thing that makes a difference.
- Create a strategy that includes People / Assets / Projects;
- Maintain the capability to access, interpret and understand your knowledge assets over time;
- Ensure that leadership & governance structures are in place that enable knowledge assets to be retained and re-used;

More information

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Competence Centre

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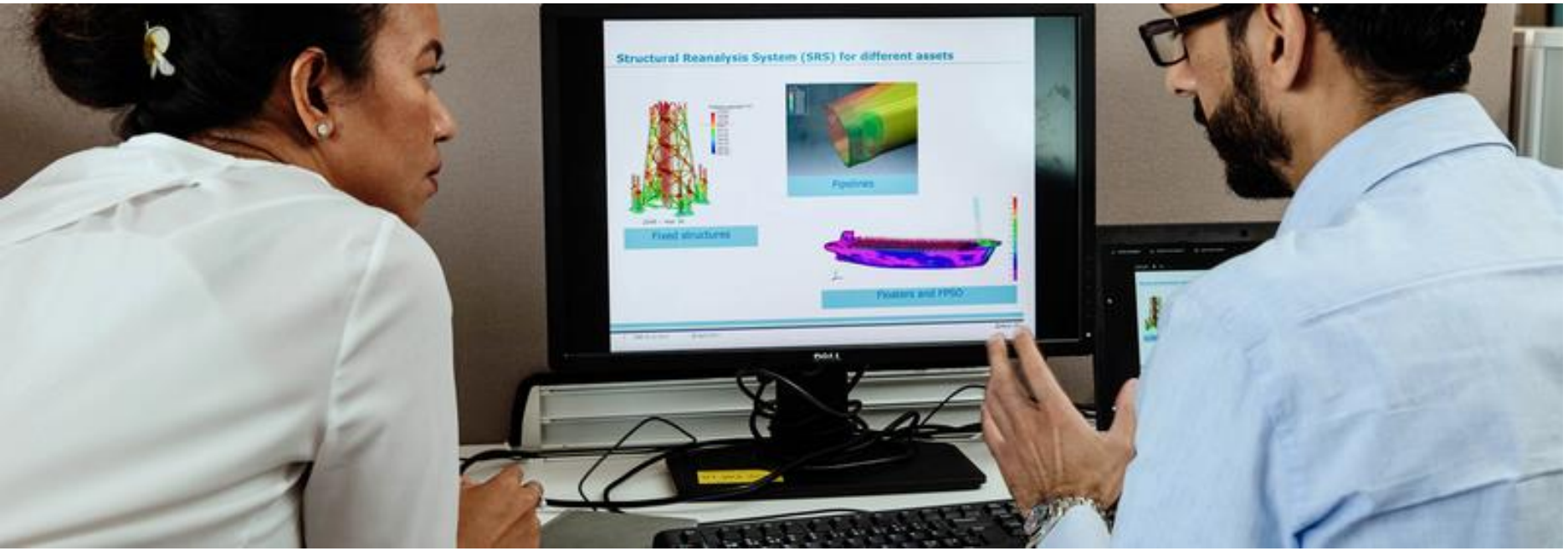

Thank you