WATER SECTOR RISK GOVERNANCE
An implementation guide for South African water utilities

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"Now more than ever, water resource managers, planners, users and anyone who in any way impacts on the quantity, quality, distribution and use of water, must fully consider uncertainty, risk and opportunity in their decision making"

United Nations, 2012

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Foreword

Water resources remain one of the most critical issues for economic growth, the integrity of natural ecosystems and human societies that depend on them. Therefore, the implementation of sound risk management and governance practices is critical to finding meaningful solutions that contribute to sustainable water management. A paradigm shift in water sector risk management and governance is also required in order to secure the efficient provision of water services in South Africa. Moreover, a change in the water sector governance structures is required to improve accountability and foster a shared responsibility and ownership of risks.

An assessment of the risk maturity of water institutions in South Africa has shown that the overall average maturity varied from 2.4 (initial) to 3.9 (managed) on a scale of 5. The results obtained are encouraging as they suggest that some organisations that are already practicing reasonably good risk governance. The Water Boards and the metropolitan municipalities were observed to have a higher maturity level compared to the small municipalities and municipal entities. The journey to risk governance excellence requires strong leadership; a clear vision; a policy, framework and implementation plan; commitment and resources to implement the plan; good governance structures; open and transparent reporting mechanisms and regular engagement with all stakeholders.

This implementation guideline serves as a primer to provide guidance in the planning, implementing and improvement of risk governance activities, irrespective of the utilities' size, legal entity or experience. It focuses on the practical steps that can be taken to achieve best practice and the main competencies required.

Acknowledgements

Chapter 1

Introduction

No organisation has the luxury of operating in a risk free environment. Organisations that provide water and sanitation services have an extra duty of care to manage risks to protect the environment and public health. The provision of safe and reliable water and sanitation services is a fundamental requirement for healthy communities and for a growing economy. The provision of these services occurs within a constantly changing social, economic, political and environmental context resulting in a complex set of hazards, risks and uncertainties. Consequently, the way in which water utilities assess and manage their business risks is changing. Over the last few years, strategic business risks, with their root causes external to the water utility, have increased in importance (World Economic Forum, 2016). The uncertainties of a changing future mean that water utilities have to demonstrate resilience and adaptability to change, which requires new ways of managing risk. A formalised capability in risk governance is therefore a critical competency in delivering safe and reliable water and sanitation services in an increasingly uncertain world.
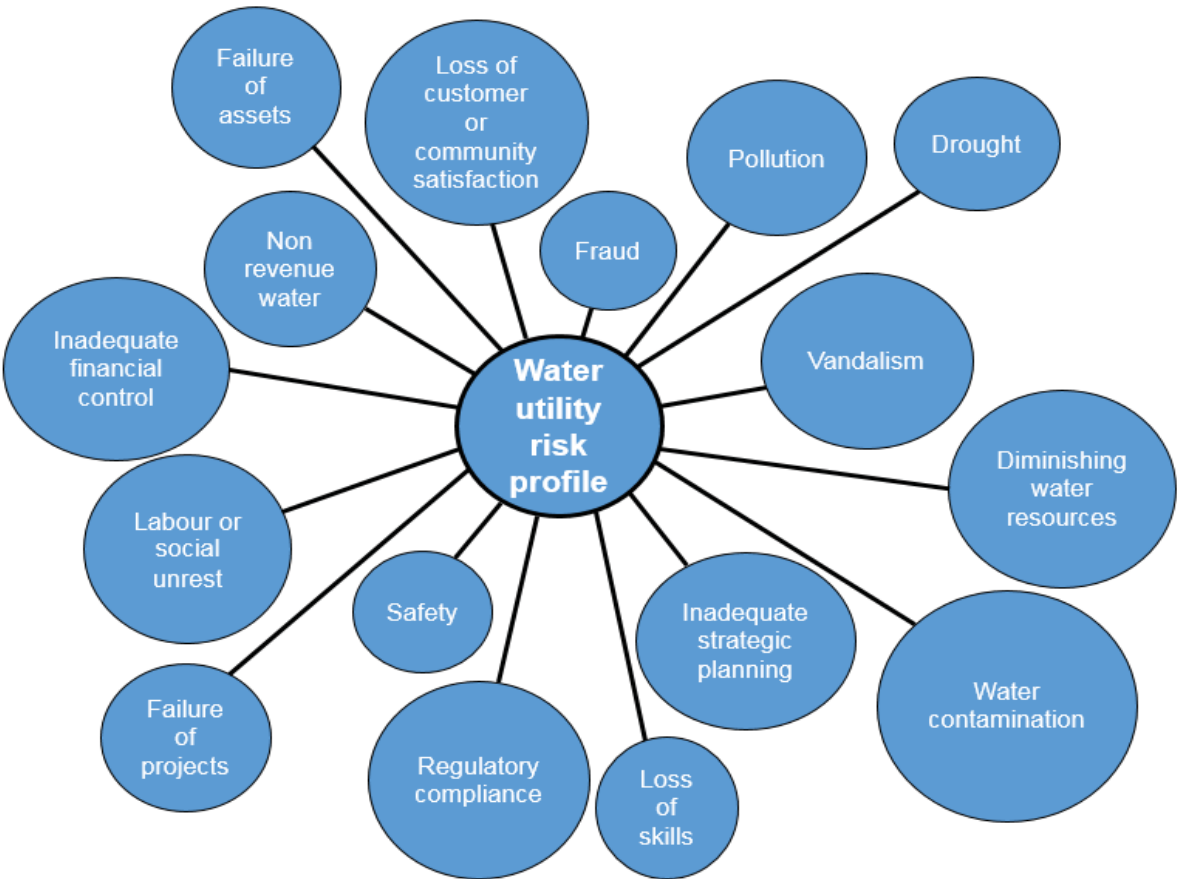
Figure 1: The risks water utilities now face extend beyond the immediate operational environment, many of which are influenced by regional, national and even international events.

WHY MANAGE RISK?

Risk is the effect of uncertainty on objectives. All organisations face risks to their objectives, and water utilities are no different. The management of risk is important for an organisation to maximise its ability to protect and create value for its stakeholders, which may include customers and shareholders. Failing to manage risks may prevent the organisation from achieving its objectives. For a water utility this could have significant consequences such as the contamination of drinking water leading to the outbreak of disease. Risk management requires the right strategic objectives to have been identified and documented (see box 1).

Legislation requires that risk is managed. For a publicly owned entity the Public Finance Management Act No. 1 of 1999 and the Municipal Finance Management Act No. 56 of 2003 state that the Accounting Officer is responsible for establishing and maintaining effective, efficient and transparent systems and internal controls for financial and risk management. The Disaster Management Act No. 57 of 2002 requires local authorities to plan for disasters through developing and implementing disaster risk management plans. The Occupational Health and Safety Act No. 85 of 1993 is concerned with risk to employee health and safety and requires employers to implement systems to manage these risks.

There are many competing pressures within a water utility, for example between investment and maintaining service levels, between short term maintenance and long term capital renewal, and between new and established technologies. Furthermore business units often compete for limited budgets. Risk management is therefore important to enable trade off decisions to be made that allows risks to be managed to acceptable levels, to allocate resources efficiently and to take advantage of opportunities. Progressive water utilities are constantly looking to the future, anticipating issues that may affect them and adapting to meet these challenges. They understand that accepting some risk is necessary to capitalise on opportunities.

> **Something to think about**
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> A risk is not only a bad thing happening, it is also a good thing not happening. Think about a new opportunity presented to your water utility, for example a new type of water treatment technology. What are the risks if you decide to pursue this opportunity? What are the risks and the opportunity cost if you don't?

WHAT IS RISK GOVERNANCE?

Historically, water utilities have managed risk using traditional linear approaches, with the focus on operational aspects such as water quality. In the last few years this has changed and a move towards frameworks of risk governance rather than just risk management is evident. The term "risk governance" is used to stress a more strategic view of risk and the human and organisational factors that affect risk management; including leadership, organisational culture and structure, decision making processes and communication (Pollard, 2008). Risk governance is concerned with the structuring, organising and coordinating of risk management activities, and therefore the definition is less concerned with operational risk management, although the operational management of risks is still important. The true value of risk governance comes when it is integrated into wider business functions and occurs within the context of good corporate governance. Many water utilities are successfully integrating risk into functions such as strategic planning, operational planning, asset management, process optimisation, financial management, project delivery, climate change, business continuity and supply chain management.

WHAT ARE THE BENEFITS OF GOOD RISK GOVERNANCE?

The ISO31000 standard identifies the following benefits of having a risk governance system:

- Increases the likelihood of achieving objectives.
- Encourages proactive management.
- Improves the identification of opportunities and threats.
- Complies with legal and regulatory requirements.
- Improves reporting and corporate governance.
- Improves stakeholder trust and confidence.
- Establishes a reliable basis for decision making.
- Effectively allocates resources.
- Improves operational effectiveness and efficiency.
- Enhances health and safety and environmental protection.
- Improves loss and incident management.
- Improves overall organisational resilience.

"Governance refers to the framework of rules, systems and processes put in place to oversee and monitor. Good governance underpins good conduct and the good judgment by those who are charged with running an organisation. Effective governance structures allow organisations to manage their affairs with proper oversight and accountability and to create value over the short, medium and long term"

Guiding Principles of Good Governance (GNDI, 2015)

SCOPE OF THIS GUIDE

The term "water utility" is used throughout this guide and includes any public or private organisation with the responsibility of water and/or sanitation service provision. In South Africa this will most likely include local or district municipalities, municipal entities, water boards or regional water utilities.

The purpose of this guide is to serve as a primer to provide guidance to a water utility in the planning, implementing and improving of their risk governance activities, irrespective of the utilities size, legal entity or experience. It focuses on the practical steps that can be taken to achieve best practice and the main competencies required. The guide is intended for water utility managers and risk managers as well as anyone else who may have some responsibility for risk management in their organisation.

This guide has been informed by various international and local standards across a variety of industries and sectors, however the focus of the guide will be on the water sector and how these standards can be applied to a water utility. The guide will be particularly useful for organisations that want to establish a new risk governance framework where none exists or to improve on existing risk governance activities.

This guide is not prescriptive as the needs of each water utility will be different, and as such they will be responsible for applying the recommendations as they see fit to meet their needs and the requirements of their own stakeholders.

There are many benefits to managing risk within water utilities; including regulatory compliance, customer and stakeholder trust, better operational performance, improved financial management, better emergency preparedness and greater employee engagement. This guide hopes to raise the profile of risk governance in the water sector and in doing so contribute to the achievement of some of these benefits.

> **Something to think about**
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> This guide is a companion to the Water Research Commission report entitled Water sector risk governance: a compendium of South African and international case studies. Have a read of this report to see what other water utilities around South Africa and the world are doing to better understand and govern their risks.

Figure 2: Good risk management is part of good risk governance, which in itself is a part of good corporate governance. With the right culture all these can be achieved.

Something to think about

Do you know what your water utilities strategic objectives are? Do you understand the impact of your activities on these objectives? Can you think of any risks to these objectives (or indeed opportunities to meet them) that your water utility has not identified?

BOX 1: STRATEGIC OBJECTIVES OF A WATER UTILITY

Irrespective of if your water utility is a water board, a privately owned water company or a department in a municipality, your primary function is to provide safe, reliable and affordable water and sanitation services. As an organisation you will need to identify strategic objectives that guide your activities. The objectives need to be vertically aligned up the organisation. For example, if you are a municipal department or municipal entity, your water and sanitation objectives must align to the municipality wide objectives and the Integrated Development Plan. It's also important to align the objectives downward to the departments, business units and teams. This can be achieved through a performance management system and job descriptions. This line of sight is very important as it ensures that all operational activities contribute to the strategic objectives of the water utility. The risk management activities can then also be aligned to the strategic objectives of the water utility.

Identifying appropriate strategic objectives can be challenging. Some objectives will be determined by regulations or the requirements of stakeholders. Others may be specific to your organisational context and operating environment. The US Environmental Protection Agency (2008) recommends that all water utilities consider developing measurable objectives that align to these ten outcomes.

1. **Product quality** – Produces potable water, treated effluent and process residuals in full compliance with regulatory requirements and consistent with customer, public health and ecological needs.

2. **Customer satisfaction** – Provides reliable, responsive and affordable services in line with explicit, customer accepted service levels. Provides timely feedback to customer needs and emergencies.

3. **Employee and leadership development** – Recruits and retains a workforce that is competent, motivated, adaptive and safe working. Establishes a participatory and collaborative organisation dedicated to continual learning and improvement. Strives to create an integrated and well-coordinated senior leadership team.

4. **Operational optimisation** – Ensures on going, timely, cost effective, reliable and sustainable performance improvements in all facets of its operations through the minimising of resource use, loss and impacts.

5. **Financial viability** – Understands the full life cycle cost of the water utility and maintains an effective balance between long term debt, asset values, maintenance and capital expenditures and operating revenues.

6. **Infrastructure stability** – Understands the condition of and costs associated with infrastructure assets. Maintains and enhances the condition of all assets over the long-term at the lowest possible life cycle cost and to acceptable risk levels, consistent with stakeholder needs and required service levels.

7. **Operational resilience** – Anticipates and avoids problems by proactively identifying, assessing, establishing tolerance levels for, and treating the full range of business risks consistent with best practice standards.

8. **Community and environmental sustainability** – Is explicitly cognizant of and attentive to the impacts its decisions have on current and long-term future community and catchment health and welfare.

9. **Water resource adequacy** – Ensures water availability consistent with current and future customer needs through long-term resource supply and demand analysis, conservation and public education.

10. **Stakeholder understanding and support** – Engenders understanding and support from all stakeholders including regulators and oversight bodies, communities, catchment management agencies and water value chain partners. Actively involves stakeholders in the decisions that will affect them.

YOUR NOTES

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Chapter 2

The Fundamentals of Risk Governance
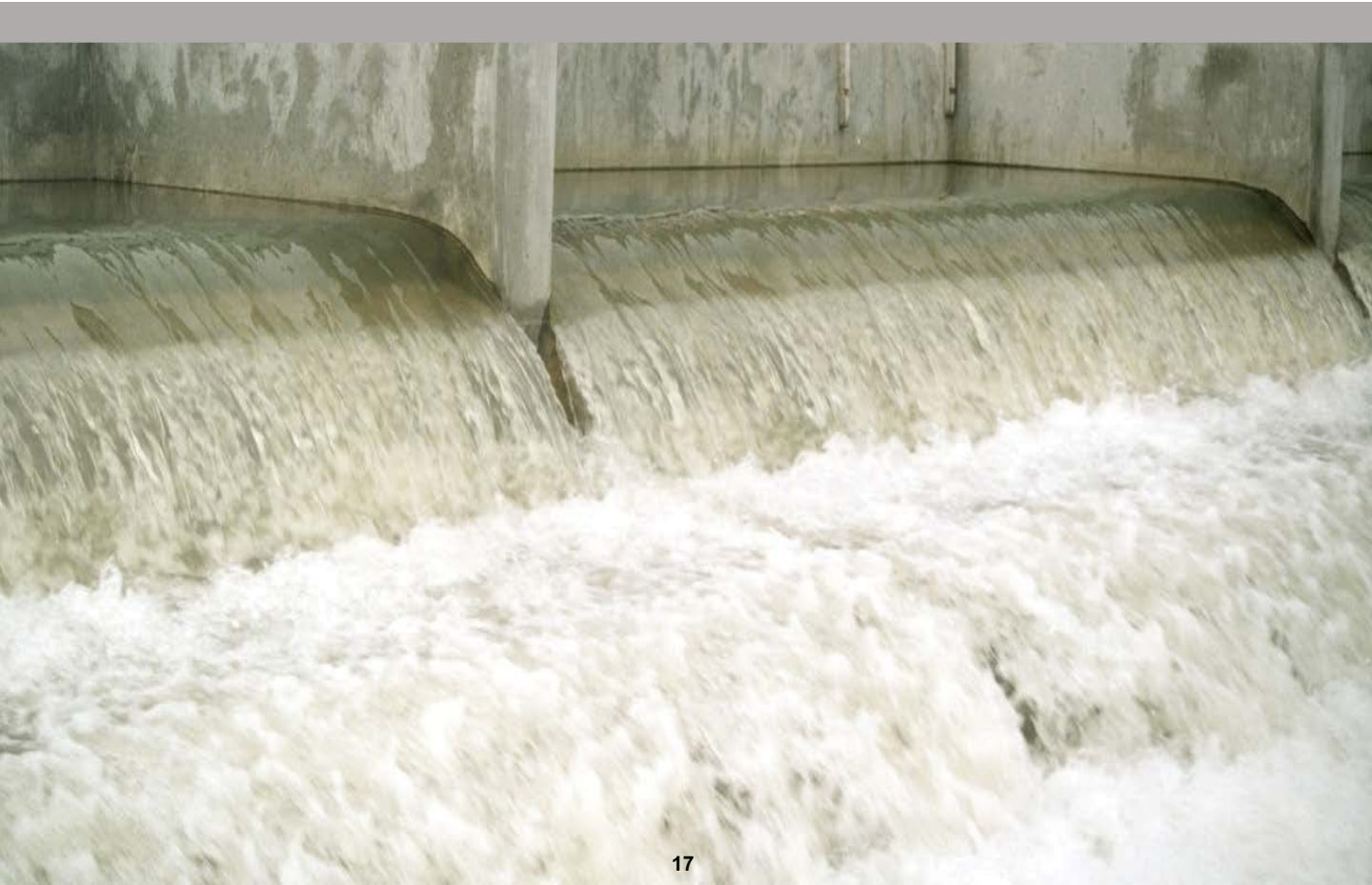
THREE LINES OF DEFENCE

Risk governance establishes the context within which risk management occurs. When a risk governance framework is implemented correctly in a water utility, it can provide three lines of defence (Adapted from Water Research Foundation, 2015).

**The first line of defence** is the operational employees in the departments, business units and teams. They are responsible for identifying and assessing risks and implementing the control activities that treat risk. The way these activities are undertaken will be defined in the risk management framework, guidelines or procedures. The first line of defence is very important as operational employees are the "eyes and ears" of the organisation and through vigilance and risk awareness, they can help protect against incidents such as water quality contamination and asset failure.

The second line of defence is the organisational risk function, sometimes called the corporate risk, strategic risk or risk and compliance function. Depending on the size of the water utility, this function may be just one risk manager, a team of risk specialists or a risk committee. The responsibilities of the organisational risk function is to establish, support and facilitate the first line of defence risk management activities; review and challenge first line of defence risk reports and control effectiveness; and to report to senior leadership on the status of risk management activities, emerging risks and business critical risks.

The third line of defence is that of internal and external auditors. They provide an independent review of the first and second line of defence activities and results to ensure that the organisational risk governance arrangements are appropriate and are discharging their roles and responsibilities correctly.
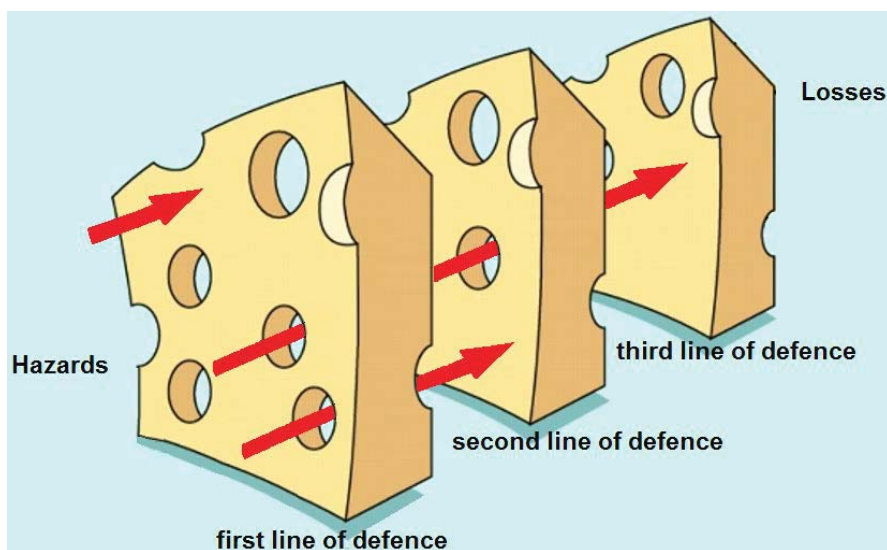
Figure 3: The Swiss cheese model shows how the defences work together to protect against losses
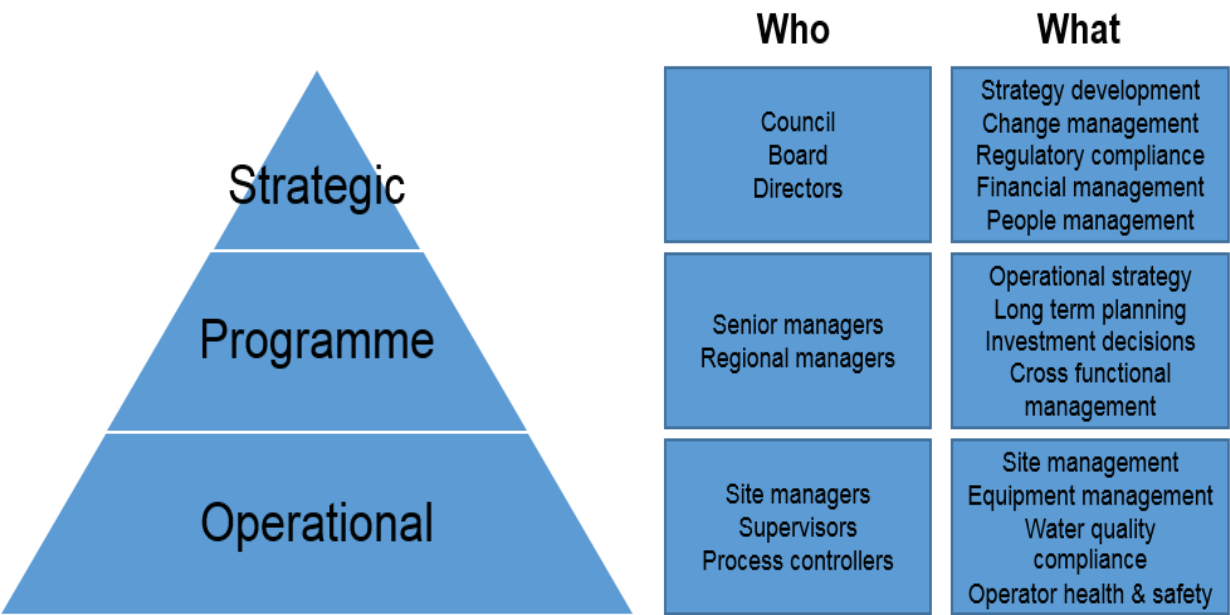
RISK GOVERNANCE HIERARCHY & RESPONSIBILITIES

The risk governance function within any organisation is usually led by the executive leadership. For a water utility the Board of directors, municipal council, mayor or executive managers will be responsible for risk governance and the delegation of authority. Executive leadership must set the tone and make the important decision on the balance of risk and reward – the risk appetite of the organisation, or the amount of risk the water utility is prepared to take in pursuit of its objectives (see box 2). There are also a number of other core functions that enable and support the governing of risk.

The structure of the organisation will determine the hierarchy that risks are managed at. For a water utility, it's likely to consist of strategic, programme and operational levels. At each level there will be different people responsible for different aspects of risk governance. The overall accountability for organisational wide risk governance will always reside with the executive leadership.

Strategic risk management is concerned with managing the risks inherent to corporate level decision making. Critical issues include decisions on strategy, management of change, regulatory compliance, stakeholder engagement, people management, the long term viability of investment decisions and financial management. It is recommended that strategic risk assessments occur when there is change to an organisational objective or strategy.

Programme risk management is about evaluating the risks across business functions, at multiple sites and geographic regions, as well as the risks associated with operational strategies and long term planning. The types of risk assessments carried out at a programme level will depend on the size and scale of the water utility. Most water utilities have monthly risk reviews at a departmental or business unit level. These meetings usually involve people from across the organisation. There could also be function specific meetings for example a capital approval meeting, a project progress meeting or a water resource planning meeting, whereby specific risks to these functions are discussed.

Operational risk management is associated with specific operations at plant or site level. For example, the risk of failure of a process component or the risk of exceeding a particular water quality standard. Water safety plans and wastewater risk abatement plans are examples of operational risk management methodologies. Operational risk management also includes the health and safety of plant operators. Such assessments typically happen daily, weekly and monthly, depending on the nature of the risks. Operational staff are the front line defence against risks occurring and as such it is important that all operators demonstrate vigilance and look out for hazards and potential risks at all times, even if it's not explicitly defined in a procedure.

	Who	**What**
Strategic	Council Board Directors	Strategy development Change management Regulatory compliance Financial management People management
Programme	Senior managers Regional managers	Operational strategy Long term planning Investment decisions Cross functional management
Operational	Site managers Supervisors Process controllers	Site management Equipment management Water quality compliance Operator health & safety

Figure 4: Decision making in a water utility usually occurs at three distinct levels. The types of decisions made and who is responsible for the decisions must be clearly defined and documented.

Something to think about

Think about how risks are considered in your water utility. Are there formal business processes at a strategic, programme and operational level? Who is responsible for these business processes and have their responsibilities been defined? Often a quick and easy way to identify risks is to list the assumptions when making a decision. These assumptions will often be the main risks you need to consider.

The table below summarises some of the key roles and responsibilities that might be appropriate to your water utility.

Name	Risk responsibility
Council	Interface with the public. Provides checks and balances.
Board or Municipal Managerial Committee	Ultimately accountable. Ensures the policy, framework, procedures and guidelines are implemented in all departments. Identifies risk appetite and tolerance levels. Develops a risk awareness culture.
Risk Committee	Provides oversight on risk governance, controls and the policy and framework. Reviews risk management progress, effectiveness and maturity. Reviews key risks.
Audit Committee	Independent review on governance and controls. Checks, tests and evaluates the effectiveness of risk management.
Risk Manager or Chief Risk Officer	Provides the Board or Municipal Manager with oversight of most significant risks across the utility. Can have delegated responsibility to develop and implement the risk policy, framework and implementation plan. Custodian of the risk management system.
Directors or Senior Managers	Ensures the policy, framework, procedures and guidelines are implemented in their departments and that risks are identified and controls are put in place.
Insurance Manager	Ensures the organisation has sufficient insurance appropriate to its risk profile.
Water Quality Manager	Manages and reports on water quality and public health risks. Implements a water quality management system and water safety plans.
Health, Safety & Environment Manager	Manages and reports on occupational health and safety risks. Implements health and safety and environmental management systems.
Risk Champions & Coordinators	Responsible for communicating and embedding the policy, framework, processes and guidelines.
All employees	Being aware and vigilant at all times. Reporting all risks. Carries out the risk management activities and tasks according to the policy, framework, procedures and guidelines.

INTEGRATING RISK GOVERNANCE WITH COROPRATE GOVERNANCE

An important component of risk governance is the responsibilities of the audit and risk committees. The responsibilities of these committees must be formally defined in their charters (National Treasury, 2010).

The audit committee is an independent committee responsible for oversight
of the organisations control, governance and risk management. Specific responsibilities include:

- Reviewing and recommending disclosures on matters of risk in the annual financial statements and annual report.
- Providing regular feedback to the executive leadership on the adequacy and effectiveness of risk management, including recommendations for improvement.
- Ensuring that the internal and external audit plans are aligned to the risk profile of the organisation.
- Evaluating the effectiveness of internal audit in its responsibilities for risk management.

The risk committee is appointed to assist the executive leadership to discharge their responsibilities for risk management. Members of the committee should comprise both management and external members with a mix of skills and competencies; including an understanding of the organisations mandate and operations, the ability to act independently and objectively and a knowledge of risk management principles and their application. The chairperson of the committee should be an independent external person. Specific responsibilities include:

- Reviewing the risk management policy, framework, strategy and implementation plan; including monitoring their implementation.
- Reviewing risk appetite and tolerance levels, ensuring that limits are consistent with the materiality and significance framework, and within the organisations ability to withstand or recover financially and operationally from significant shocks.
- Ensuring the risk identification and assessment methodologies are adequate.
- Evaluating the effectiveness of integration of risk management within the organisation.
- Evaluating the effectiveness of risk treatments and controls.
- Interacting with the audit committee to share information.
- Providing timely and useful reports to the executive leadership about material risks and recommendations for improvement.

The figure below shows an example of how the risk committee, audit committee and risk management function can work within a wider corporate governance structure. When established correctly, this will provide the right checks and balances between decision makers and stakeholders.
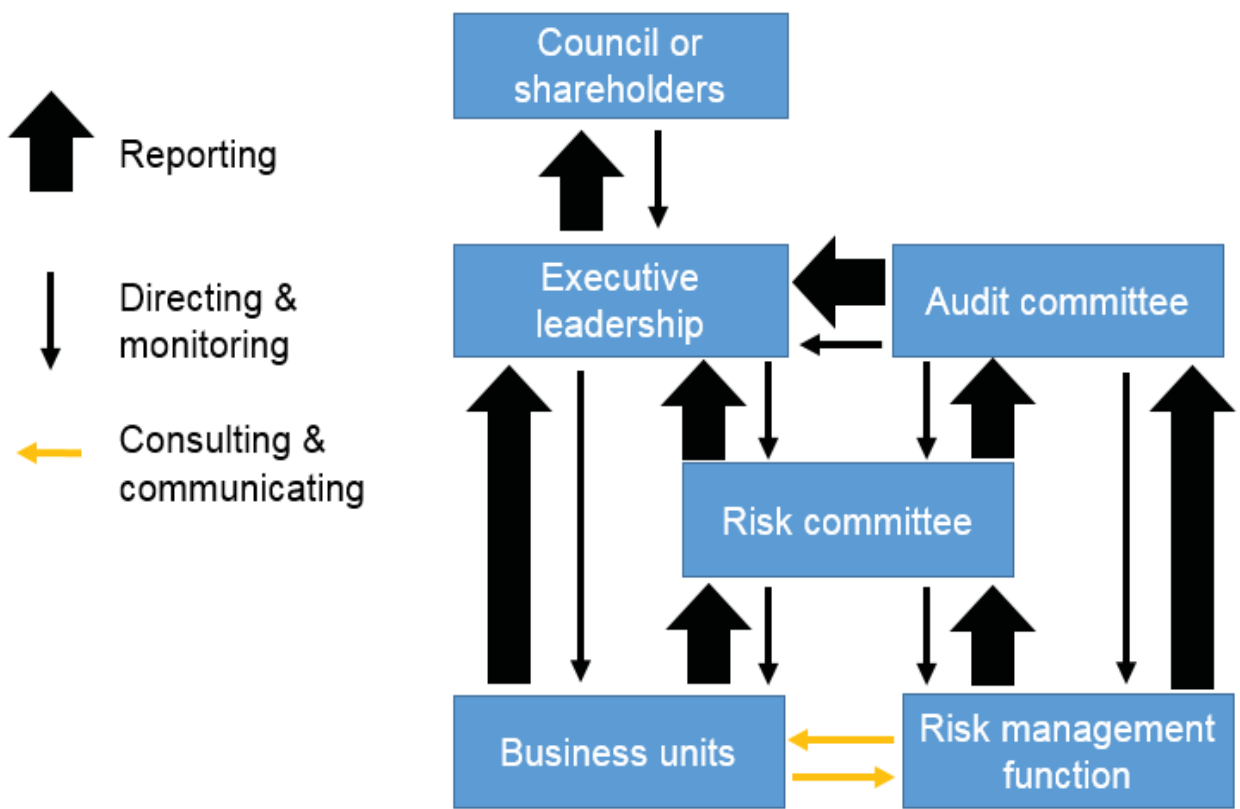
Figure 5: The establishment of sound corporate governance structures will provide assurance that risks are being managed appropriately.

The legal or ownership structure of your water utility will dictate how corporate and risk governance structures are established. What will be common between all entities are the principles described in King III and Batho Pele. These principles are drafted on the basis that, if they are adhered to, any entity can practice good governance.

BOX 2: RISK APPETITE & TOLERANCE

The executive leadership team must define the levels of risk appetite and tolerance (King, 2009). The ISO31000 standard defines risk appetite as the amount and type of risk that an organisation is prepared to pursue, retain or take in the achievement of its objectives. Risk tolerance is the readiness to bear the risk after risk treatment. All organisations need to understand their levels of risk appetite and tolerance in order to balance risks with opportunities and rewards. Taking risks without a conscious decision on how much risk the organisation is prepared to take, or can tolerate, could lead to an unfavourable outcome.

Water utilities must define their own risk appetite and tolerance levels and these must be recorded in the risk framework and hardcoded into the risk register, risk criteria and decision making procedures. Both quantitative and qualitative definitions can be used depending on the impact in question. Spencer Picket (2005) recommends that risk appetite and tolerance is defined in the same units that the associated objective is. For example, for risks with a financial impact, an assessment of variation of operating profit can be undertaken, to see what amount of money is typically available in the business to deal with this type of impact if it were to materialise. A risk with a financial impact equal or greater than this predetermined value can be deemed to be at the tolerance level. A similar approach can be followed for other risk types, such as environmental, reputation, water quality and health and safety. There could also be some risk types where the appetite or tolerance is zero; this will depend on your context and the needs of your stakeholders.
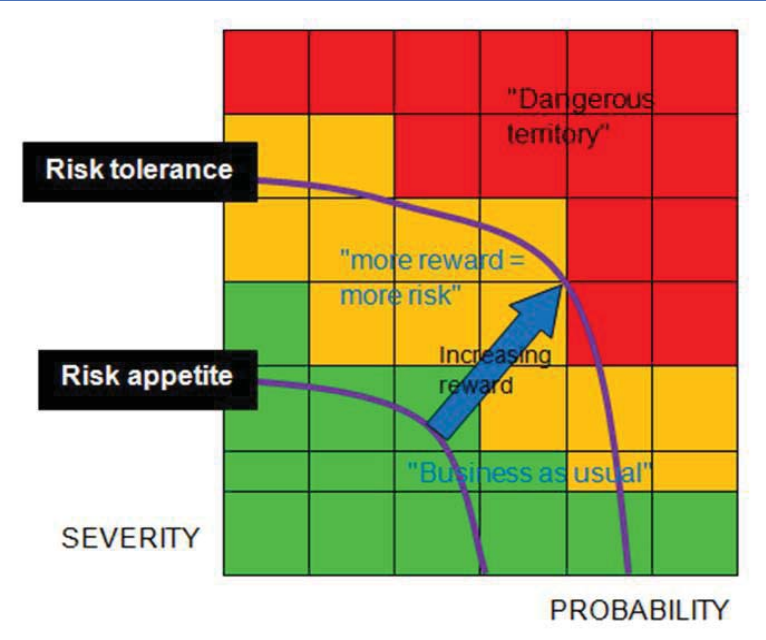
Figure 6: A matrix is an easy way to display the appetite and tolerance thresholds. As different types of risk will have different thresholds, it is recommended to develop a matrix for each risk type.

Something to think about

Has your organisation clearly stated what its level of risk appetite and tolerance is? How was this defined? How has it been communicated? How do you ensure all risk based decisions result in outcomes that are within the thresholds? If a decision is made that results in an outcome above the threshold, who is informed?

THE RISK GOVERNANCE FRAMEWORK

There are various risk governance frameworks that can be used to design and implement better risk management in an organisation. The most widely used are COSO (2004), the International Risk Governance Council (2006) and the International Risk Management Standard ISO31000 (2009). The diagram below shows the risk governance framework adapted from ISO31000. The central part of the diagram shows the sequential actions to be taken for identifying, analysing, evaluating and treating risks, all within the context of the organisation. The outer boxes show the other governance processes required.
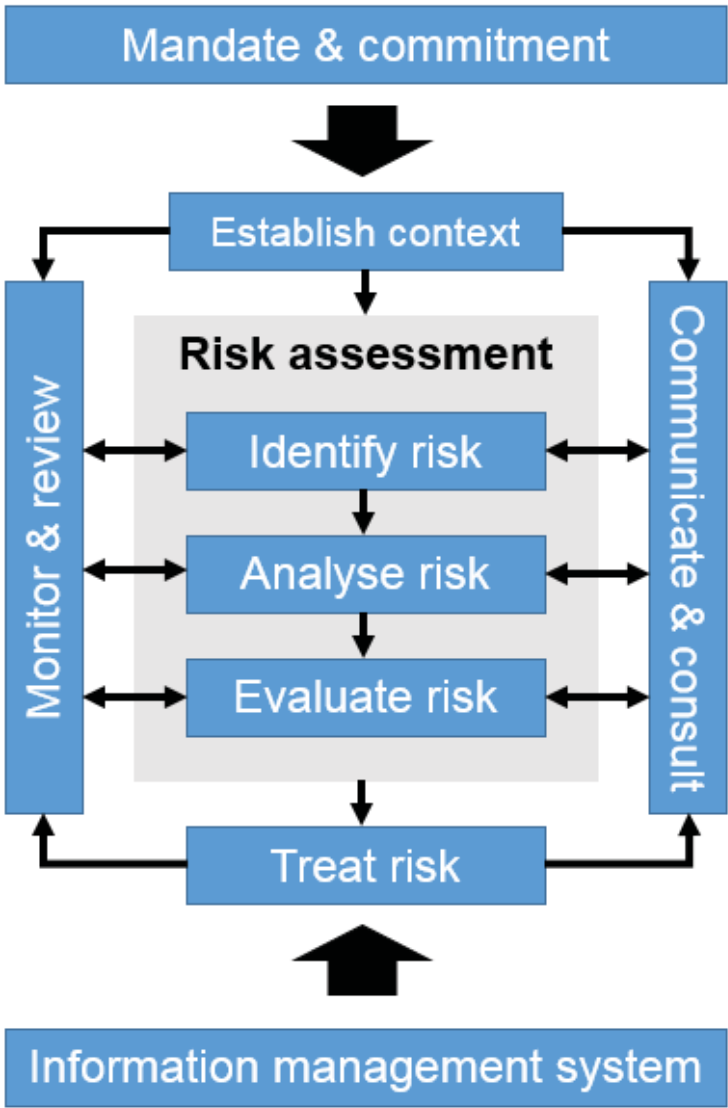
Figure 7: The overall risk governance framework includes the risk assessment activities as well as wider activities such as mandate and commitment, communication, consultation, monitoring and reviewing (Adapted from ISO31000, 2009).

The components of the framework are described briefly below.

Mandate and commitment is about securing support from the executive leadership. This support is vital for the success of risk governance in any organisation. For a water utility the Board of directors, municipal council, mayor or executive managers will be responsible for risk governance and the delegation of authority. A risk governance policy and framework needs to be established, communicated and implemented (see box 3). In addition, different parts of the organisation are mandated to fulfil certain roles, and ensure that the aspects of good risk governance are applied. This may include a risk manager, operational managers, risk champions and risk coordinators.

Establishing the context is about defining the objectives that the organisation wants to achieve, how it intends to achieve these objectives (the operating model), and which internal and external factors may get in the way of achieving the objectives. Internal context will include organisational structure and culture, existing resources and capabilities, policies and strategies, information systems, information flows and decision making processes. The environment outside the operational control of the organisation makes up the external context. It will be important to understand the social, technological, economic, environmental and political drivers that influence the organisation, on an international, national, regional and local scale. Consideration must also be given to external stakeholders and their relationship with the organisation, as well as how they perceive and value the organisation, its objectives and related risks.

Communicate and consult is about providing the right people with access to the right information at the right time. An organisation should develop its risk communication and consultation strategy at the beginning of the process to ensure all stakeholders are informed every step of the way. Ensure a wide range of stakeholder involvement in all stages of the process as people's perception of risk is different. Effective communication can help build a better reputation and stakeholder confidence in your organisation.

Monitor and review are the activities undertaken to ensure that the risk management process actually works and that it happens at the appropriate level of cost and effort. Indicators must be established that are then used to measure the performance of the risk governance policy, framework and implementation plan. It is also important to monitor the risks and how they change, the effectiveness of controls and treatments, residual risks and identify emerging risks. Findings of the monitor and review activities must lead to continual organisational improvements.

BOX 3: RISK GOVERNANCE POLICY & FRAMEWORK

The executive leadership team has the mandate to develop the risk governance policy for the organisation. This policy should clearly state the organisation's objectives for and commitment to risk management. The policy will typically include the following (Adapted from Institute of Risk Management South Africa, 2014):

- Outline the organisation's rationale for managing risk.

- Identify the link between organisational objectives and the risk governance policy.

- Identify legislative and regulatory requirements.

- Define the overall criteria according to which risks will be managed.

- Assign accountabilities and responsibilities for managing risk.

- Define how conflicts of interest are dealt with.

- Commitment to make the necessary resources available.

- Define how risk management performance and success will be measured.

- Commitment to review and improve the risk management system periodically.

- Define how the policy will be communicated.

The risk governance policy is a high level statement of intent. In order to operationalise the policy, a risk management framework needs to be developed and implemented. The risk management framework should be designed with the organisational context in mind and should include:

- Reference and alignment to the risk governance policy.

- A description of responsibilities for managing risk at each level of the organisation.

- A set of guidelines or standards on how to manage risk at each level of the organisation.

- A common risk language and definitions to ensure everyone understands the same thing.

- Definition of risk appetite and tolerance thresholds to ensure everyone knows what is acceptable and what is not.

- The risk management process outlining how to identify, assess, evaluate and treat risks.

- Definition of risk criteria such as consequence and likelihood scales, timeframes and how to deal with risk interdependencies.

- A description of the performance evaluation criteria.

- Integration with supporting systems such as corporate governance, engineering, health and safety, environment, quality and legal.

- Communication and reporting procedures outlining how and with whom information about risk will be communicated.

- The resources required to implement the framework.

Like the policy, the framework needs to be well communicated to all employees, with specific training and guidance provided to those employees with specific risk responsibilities.

RISK ASSESSMENT

Risk assessment is made up of identifying, analysing and evaluating the risks. It is important to identify what could cause an organisation to deviate from its objectives, to determine how likely it is to happen and what the consequences could be if it does happen. This is followed by prioritising the risks to enable the highest priority ones to be addressed first. Before any risk assessment activity can occur, the risk criteria need to be defined. The criteria must align with the organisational objectives and risk management policy and will include how likelihood is defined, how consequence is defined, timeframes of likelihood and consequence, the level that risk becomes acceptable or tolerable and how to address interdependent risks.

Identifying the risk is arguably the most critical part of the process for if the risks are not adequately identified in the first place then the policy and framework are of no use. There are many well established tools and techniques used to identify risks in the water sector. The organisation should apply risk identification tools and techniques that are suited to its objectives and capabilities, and to the risks faced. All risk identification should be based on the most reliable and robust data available and should be undertaken by people with the appropriate knowledge and skills to identify risks.

Risk analysis is about developing a better understanding about the consequence of an event and the likelihood that the consequence will occur. A wide range of techniques to analyse risk exist. In many cases it is advised to use more than one technique during the risk analysis process. The depth of analysis depends entirely on the context, and will be determined by the specific risk in question, the availability of reliable data and the organisation's decision making criteria.

Risk evaluation is the last step in the risk assessment process and involves comparing the risks against predetermined criteria and determining the significance of the risks to the organisational objectives. The decision making criteria should have been specified at the beginning of the risk management process and recorded in the risk management framework. The outcome of the risk evaluation stage will be a decision on how to treat or control the risk and to determine the amount of residual risk that is acceptable. Risk evaluation may also lead to further analysis or the decision not to treat a risk but rather monitor it or continue with existing controls.

RISK TREATMENT

Risk treatment involves identifying, prioritising and selecting options to modify the risk, and the subsequent implementation of the selected option. Responding to risks is a cyclical process that begins with assessing a current or proposed risk response for suitability and effectiveness. When choosing how to respond to a risk, one should determine whether the residual risk levels are acceptable, and if not, consider what additional responses may be required. This will ensure that risks are managed within the risk tolerance and risk appetite thresholds. It is also important to balance the costs and benefits of each treatment option and to select the option that provides the lowest whole life cost. Once a treatment has been identified, an implementation plan will be developed that:

- Outlines the reason for the selected option and its benefits.
- Describes how the treatment will be implemented.
- Describes who will implement it.
- Sets out timescales.
- Identifies the resources required.
- Describes how the treatment will be monitored to ensure it is effective.

Failure of the treatment is in itself a major risk and measures need to be taken to manage this. Also some treatments can introduce secondary risks that will then need to be assessed and potentially controlled. These secondary risks should be incorporated into the same treatment plan as the original risk and not treated as a new risk.

RISK TREATMENT STRATEGIES

The following are different risk treatment strategies available to respond to or control a risk. They may not all be suitable in all circumstances and it is important that people with the correct skills and experiences decide on which option is best.

Accepting or tolerating the risk – The organisation may decide to accept the level of risk when the costs of responding to the risk does not create or protect sufficient value to justify additional effort.

Avoiding the risk – The organisation may decide to avoid the risk by deciding not to pursue or continue the activity that gives rise to the risk exposure. The organisation will not suffer the consequences but will also not have the opportunity to benefit from the activity. For example, installing a new desalination water treatment technology may increase the use of energy, which the water utility is unable to manage. Consequently, by not implementing the technology, they avoid the risk but also do not benefit from the new water resource. It's these kind of trade off decisions that water utility managers need to make all the time.

Terminate the source of risk – The organisation may be able to remove the source of risk. For example, replacing a chlorine gas disinfection system with a liquid hypochlorite system will eliminate the risk of a toxic gas leak.

Mitigate by changing the likelihood – The organisation may decide to influence the likelihood of an event. This usually adjusts either the operating processes or human behaviour that give rise to the risk. These are known as preventative controls. For example, regularly maintaining a pump according to the equipment manufacturer's specification will reduce the likelihood of a mechanical failure.

Mitigate by changing the consequence – The organisation may decide to change the impact of a risk. This requires a good understanding of the impacts and consequences of an event and who may experience them. These are known as corrective controls. For example, by having an effective emergency response plan for certain catastrophic operational events, will help limit the impact of an event if it does happen.

Transferring the risk – The organisation may be able to transfer the risk (usually at a price) to another party. This is usually applicable to manage the financial consequences of a risk, and includes contractual agreements, outsourcing and insurance.

When deciding on which control or treatment approach is best it is important to consider various factors including economic, technical, social, environmental and managerial capabilities.
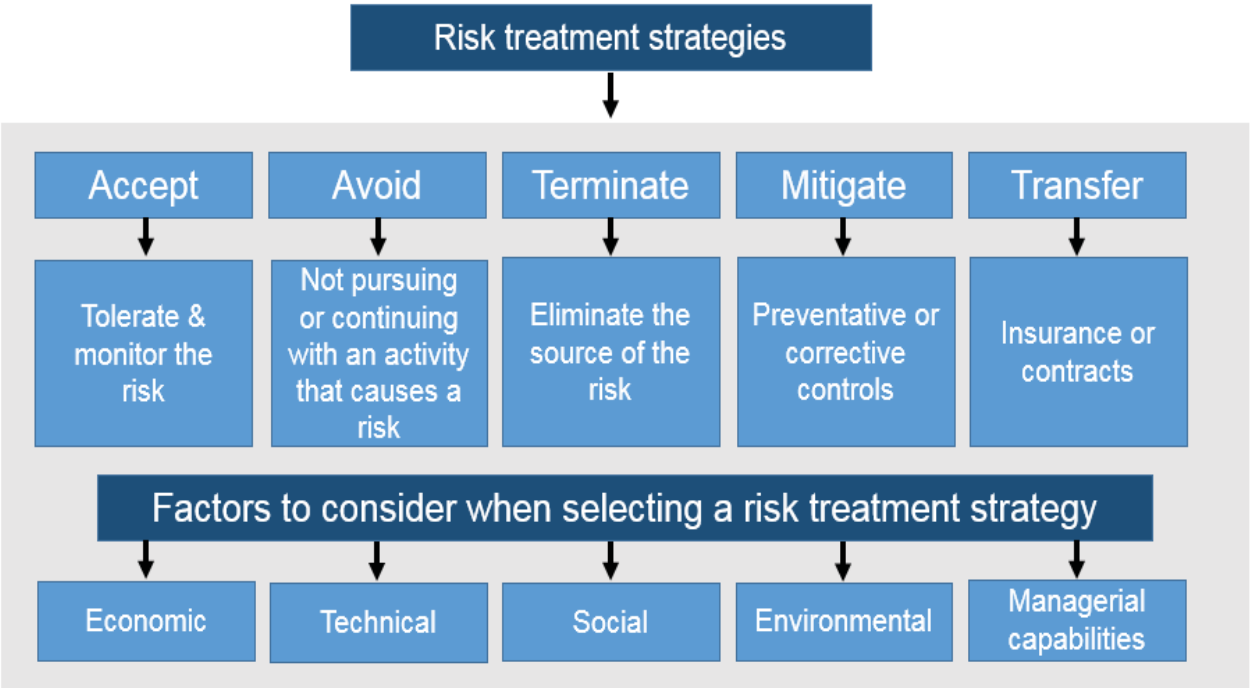
Figure 8: There are various risk treatment options available and it is important that the correct option is selected to reduce the risk to acceptable levels and allocate resources wisely.

Something to think about

Think about a risk you are responsible for. What treatment option was selected to manage the risk? How was this decided? How do you know that this was the best choice? Is there an alternative option that might be better? Do you check to see the treatment option is still appropriate and providing cost effective risk reduction?

INFORMATION MANAGEMENT SYSTEMS

Recording the risk management process is required to ensure it is auditable and decisions are traceable. A risk register is often used for this purpose (see box 4). The type of information management system needs to be right for the context. Some water utilities use spreadsheets, whilst others have specific risk software. Regardless of the system used, it is important that there are defined responsibilities for inputting and editing data, there is adequate version control in place and that the system allows for easy reporting and communicating of risk information as well as the ability to cascade risks upwards from the operational register to the strategic register.
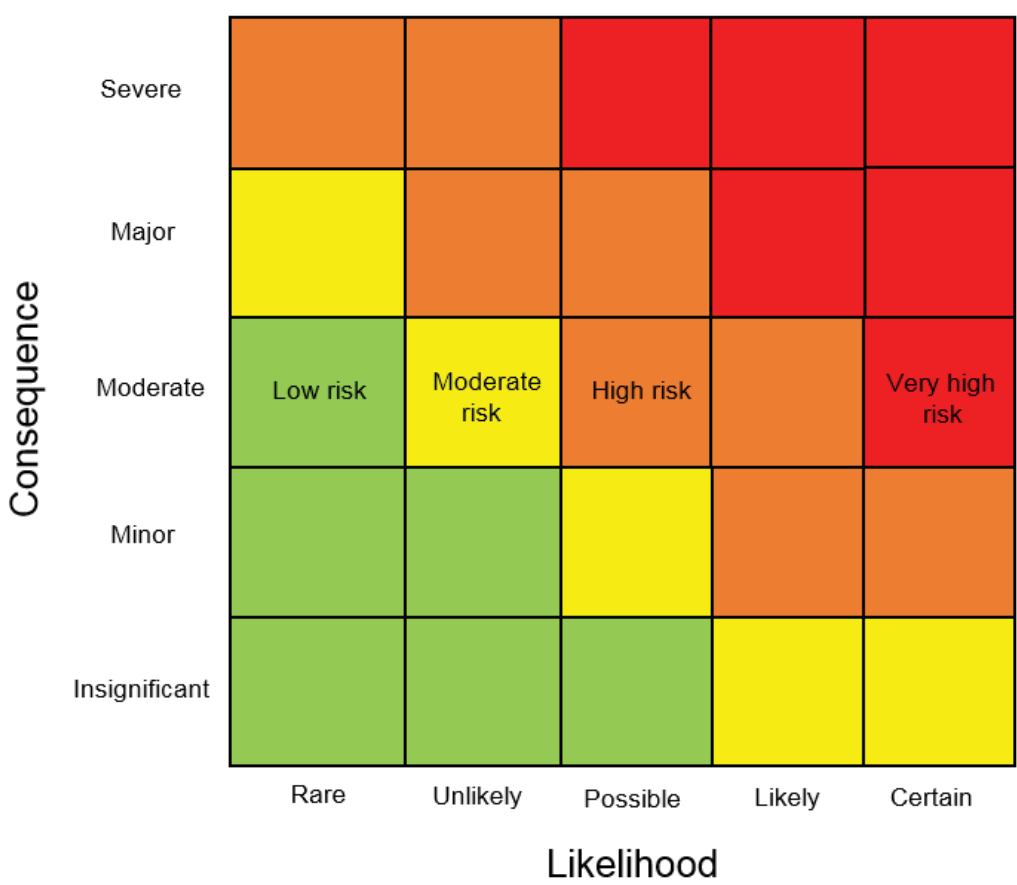
Figure 9: A risk matrix is often used to show the relationship between the consequence of an event and its likelihood. Care needs to be taken when using such a methodology to prevent an over simplification of systemic risks and their interdependencies.

Something to think about

What type of information management systems do you use to manage your risks? If you have more than one system, how do you ensure consistency? Do your risk registers have the same risk criteria and can operational risk registers roll upwards into a strategic risk register? What improvement can you make to your risk information systems?

BOX 4: COMPONENTS OF A RISK REGISTER

The risk register is a "living" document that must be regularly reviewed and used to direct managerial effort. The register can include various components that suit the organisational needs. Some components to consider include:

- Risk name, description, root cause and reference number.

- Risk category, such as reputational, financial, safety, environmental, water quality etc.

- Organisational objective or outcome affected.

- Likelihood quantification and rationale.

- Consequence quantification and rationale.

- Total risk score or value and a comparison of this to risk appetite.

- Risk owner.

- Risk treatments including responses and controls.

- Residual risk and a comparison of this to risk tolerance.

- Risk treatment effectiveness.

- Risk treatment owner.

- Applicable dates such as when the risk was entered into the register, review dates and reporting dates.

- Risk interdependencies.

The following issues need to be avoided when using risk registers:

- Overloading the risk register with data, information and risks that are not important or without some prioritisation. This will only confuse decision makers and potentially obscure useful information or risks.

- Generating risk registers that do not reflect the dynamic nature of the risk environment. This is the case when risks never seem to leave the register or high priority risks never change year on year.

- Having a risk register that does not allow for decision making and management action. This is the case when there is no accountability for a risk or its treatment and inadequate reporting on progress.

- Having multiple risk registers that are inconsistent in their risk criteria or having a disconnect between operational, programme and strategic risks.

- No version control and inappropriate access to enter data, edit data and change risk priorities.

- Using the risk register to overestimate risks and in doing so secure budgets for your area of responsibility.

- Having a risk register that requires lots of manual manipulation of data and information to allow for reporting.

- Relying on the risk matrix for the absolute ranking of risks. Risk matrices can infer linearity, whilst in reality risks may differ by order of magnitude and are rarely linear in nature. It is also important to avoid bunching risks together in the middle with little resolution between them. To overcome this, some water utilities use a 6x6 matrix rather than the traditional 5x5 matrix.

- Using a risk matrix that another utility has developed. It is important that you develop your own risk matrix with its own criteria that are relevant to your organisation, your context, the risks you face and your stakeholder expectations.

Something to think about

Whilst some think that the order you asses consequence and likelihood is not important, it can make a difference. It is recommended to assess the consequence of an event occurring first, followed then by the likelihood that the consequence occurs. If these steps are performed in reverse, likelihood evaluation may be concerned with the likelihood of a hazardous event occurring. For example the probability of asset failure, rather than the likelihood of an event occurring and leading to a defined outcome, for example the probability of an asset failing and leading to a given environmental impact. By assessing the likelihood first you may overestimate risk as you may not consider barriers and controls inherently protecting the system. Here is an example:

A sewage pumping station has two pumps that operate duty standby. A risk assessment is being carried out at the station. Pump performance evidence suggests that a pump is likely to fail completely in the next six months. The consequence of the pumping station failing would be pollution to a river located next to the station. The manager decided the risk is high and spends money on replacing the pumps. What has happened here is that the likelihood of the pump failing has been defined, not the likelihood of pollution.

Doing the assessment the other way around may give a different outcome. The consequence of a pumping station failure would be pollution to the river. The likelihood of pollution occurring is a function of both pumps failing at the same time and the storage capacity of the station being exceeded before an operator can repair the pumps. Therefore the likelihood of pollution is lower than the likelihood of pump failure. The manager decided that pump replacement would not be required yet and the risk would be managed by monitoring the pumps more closely.

YOUR NOTES

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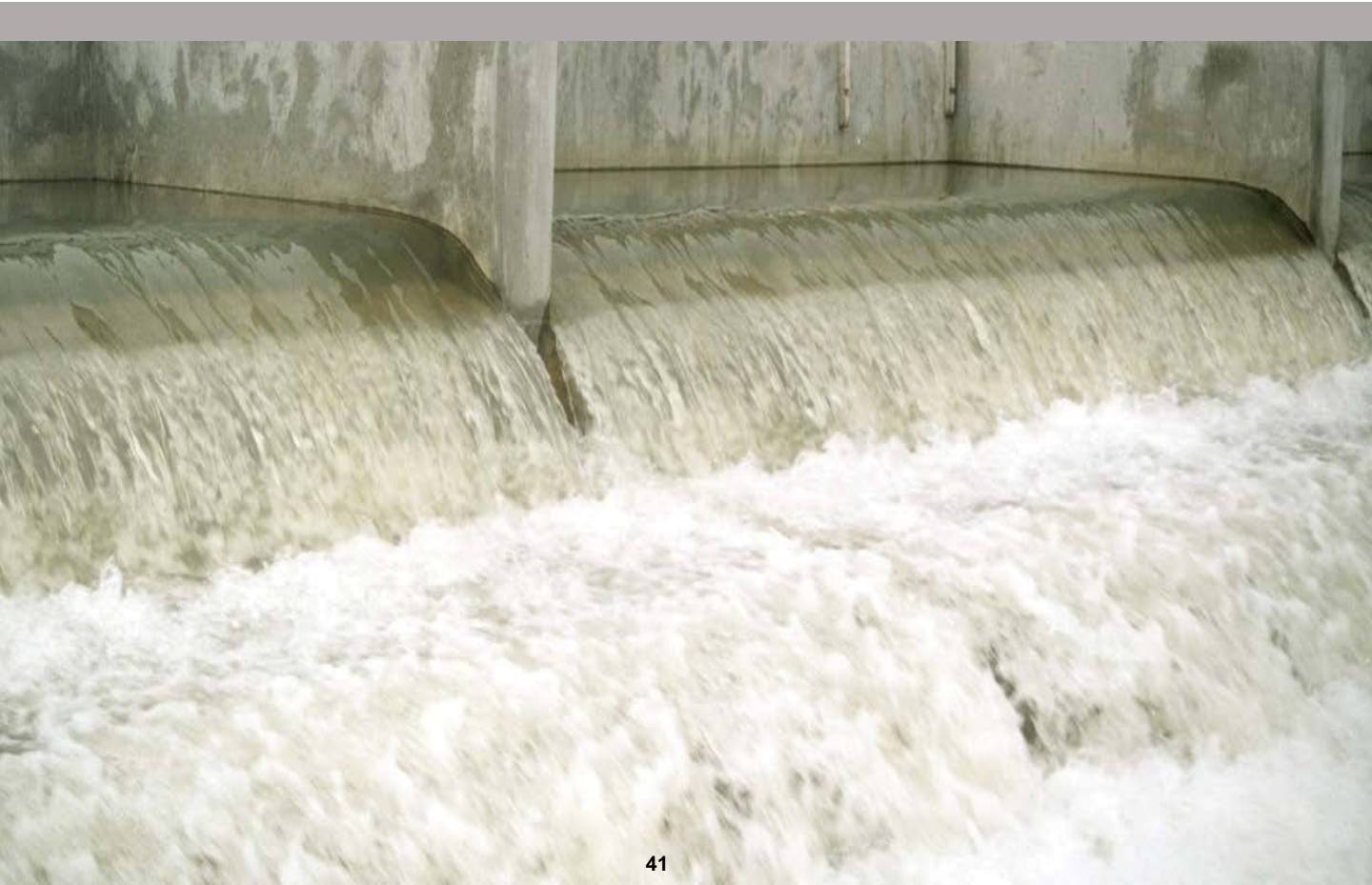
Chapter 3

Tools & Methodologies

Many risk assessment tools and methodologies exist for strategic, programme and operational risk assessment. Refer to ISO31010 for more information about these. Water utilities continuously gather and collect data about their assets, systems and processes. This data can be used to develop risk information, which can then provide knowledge for informed decision making. Best in class water utilities usually develop and use formal tools and methodologies to assist in risk assessments and decision making. For example, in the United Kingdom it is a regulatory requirement that water utilities use risk based methodologies to develop their capital and business plans. The common framework developed by the United Kingdom Water Industry Research (2002) provides some excellent guidance and methodologies.

However detailed risk analysis is not a prerequisite for effective risk management. Established standards of performance and codes of practice such as engineering standards, design codes and procedures can provide a good level of protection and control if they are adhered too. The selection of a tool or methodology needs to be right for your organisation, your capabilities and the risks in question. The section below summarises a few of the more commonly used tools and methodologies that water utilities are using to assist in risk assessment.

WATER SAFETY PLANS

The primary purpose of risk management in water utilities is to protect public health. A methodology that is well established for this purpose is a water safety plan. Water safety plans use the multiple barrier principle whereby controls are established at all stages in the process of producing and distributing water in order to protect water quality. This includes source protection, treatment through several different stages and prevention of contamination during distribution to the end user. The main steps followed when designing and implementing a water safety plan are as follows (World Health Organisation, 2004; Water Research Commission, 2009):

Assemble a team – A multidisciplinary team of experts with a thorough understanding of drinking water systems must be assembled. This will include engineers, scientists, catchment and water managers, water quality specialists, environmental or public health professionals, operational staff and representatives from your customers.

Document and describe the entire water system – Develop a comprehensive understanding of the water supply system from source to tap, including all existing water sources, processes, assets and infrastructure.

Assess the system – Provide an assessment and characterisation of the system including identification of potential pollution sources in the catchment, measures of source protection, treatment processes and storage and distribution infrastructure. Provide a process flow diagram.

Undertake a hazard assessment and a risk characterisation – Identify potential hazards and risks and quantify using a defined methodology.

Identify control measures – Identify control measures that can be applied to manage the hazards and risks. Use a multiple barrier approach to provide more than one level of protection where this is appropriate.

Undertake verification and control monitoring – Each control measure needs to be monitored to ensure it is effective and that water quality and public health targets are being achieved. Verification is necessary to ensure that the system as a whole is operating safely.

Prepare management procedures – Management procedures need to be drawn up that define what needs to happen and who needs to do what under both normal conditions and when incidents and emergencies happen.
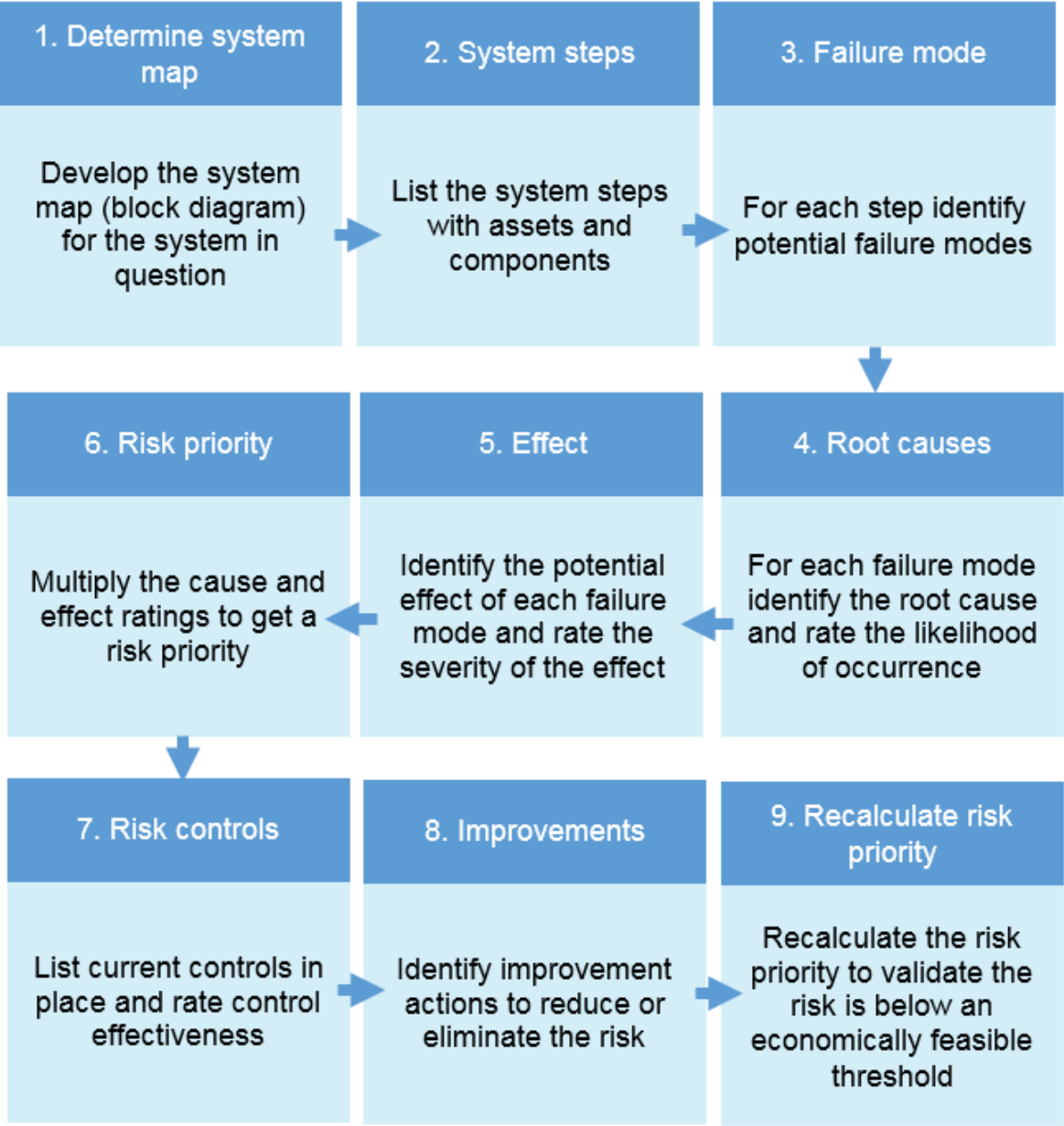
Develop supporting programmes – Supporting programmes must be developed such as verification protocols for the use of chemicals and materials in the drinking water system, water quality monitoring, maintenance and refurbishment programmes.

Establish documentation and communication procedures – All the relevant information regarding the water supply system must be documented including an up to date asset register and asset management plan.

A wastewater risk abatement plan follows the same principles as a water safety plan and is applicable to wastewater systems (Water Research Commission, 2011). Although very useful tools, water quality is only one aspect of a water utilities business, and consideration needs to be given to risks outside the immediate operating environment or technical system.

FAILURE MODE EFFECT ANALYSIS

Failure mode effect analysis (FMEA) is a structured and systematic methodology used to assess risks in a system and how a component failure may affect the entire system. It was traditionally used in the manufacturing sector, but over the last few years it has been adapted and used to assess the risks associated with water and sanitation systems. Such an approach can be very powerful as it provides a consistent, evidence based system wide understanding of your assets. This information can be used to undertake asset criticality assessments, design maintenance plans or inform refurbishment and replacement programmes.

1. Determine system map	2. System steps	3. Failure mode
Develop the system map (block diagram) for the system in question	List the system steps with assets and components	For each step identify potential failure modes

6. Risk priority	5. Effect	4. Root causes
Multiply the cause and effect ratings to get a risk priority	Identify the potential effect of each failure mode and rate the severity of the effect	For each failure mode identify the root cause and rate the likelihood of occurrence

| 7. Risk controls	8. Improvements	9. Recalculate risk priority
List current controls in place and rate control effectiveness	Identify improvement actions to reduce or eliminate the risk	Recalculate the risk priority to validate the risk is below an economically feasible threshold

Figure 10: FMEA is a very useful tool to understand the relationship between system components, the likelihood and the effect of a component failure on the system.

DETERIORATION MODELLING

Water utilities operate a variety of civil, electrical and mechanical assets such as pumps, tanks and pipelines. When these assets fail in operation there is often a significant impact on service provision. In particular, pipelines such as water mains and sewers are buried and therefore it can be challenging to undertake a visual condition assessment. Deterioration modelling is a methodology used to get a better understanding of the likelihood of an asset failing based on a relationship with other factors of the system. For a pipeline these factors could include age, soil conditions, material, traffic load, diameter or the operating pressures. A data driven predictive model can be developed that applies statistical analysis, such as regression, to the available data and then provides a prediction of when the asset may fail. Such approaches are useful to understand asset performance at a programme level. Deterioration modelling needs to be used in conjunction with a robust consequence analysis. For pipelines this could include hydraulic modelling or spatial analysis using a geographical information system.
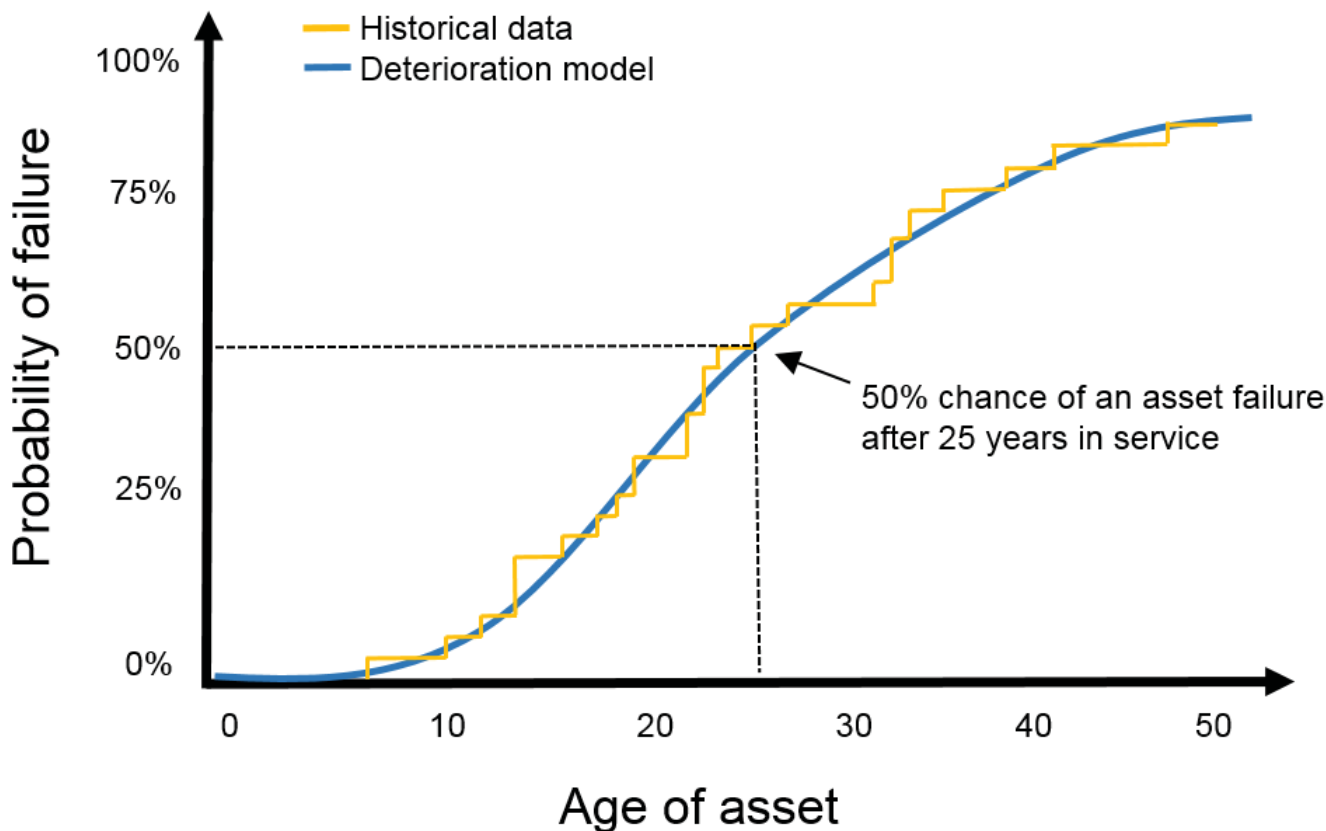

Figure 11: Deterioration modelling is widely used to predict pipeline failures and when used together with a consequence analysis, can be used to develop risk based investment plans.

SOURCE – PATHWAY – RECEPTOR MODEL

The source – pathway – receptor model is commonly used when assessing the risk of contaminated land, but can equally be applied to water and sanitation applications such as flood risk assessment, pollution risk assessment and dam safety assessment. The approach is based on the premise that in order for a risk to materialise there needs to be a source of the risk (or a hazard), something that could be affected by the hazard (the receptor) and a pathway between the two. The approach follows the systematic identification and quantification of the likely sources, pathways and receptors. This can provide a useful system wide perspective on the hazards and risks and what possible barriers could be applied. For a water utility most risks are managed when effective barriers are established to prevent failures and protect against hazards. These barriers do not have to be physical in nature and often include soft approaches such as:

- Source water protection zones.
- Water quality monitoring.
- Training of managers, operators and process controllers.
- Site operating manuals, operating procedures, design codes and standards.
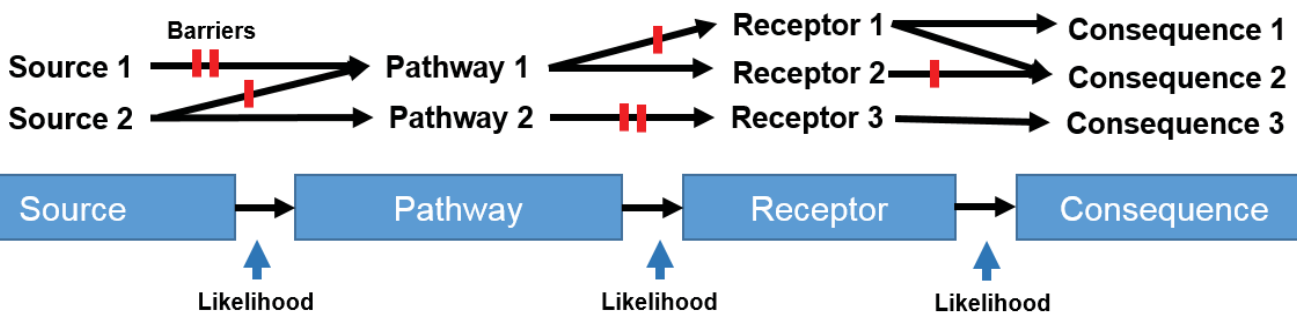
Figure 12: Understanding the link between a hazard source, a pathway and a potential receptor can build a system perspective to understanding risks. Such an approach could be used in water safety planning.

SWOT ANALYSIS

A SWOT analysis is a structured planning methodology used to evaluate the strengths, weaknesses, opportunities and threats involved in a project or a business activity. It involves specifying the objectives of the project or business activity and identifying the internal and external factors and risks that may impact on the achievement of the objectives. This methodology can be used when developing a strategic plan for an organisation or within a department or team. It can also be used by a risk manager when first establishing a risk governance function in an organisation. The approach can be further enhanced when used together with the STEEP categories (social, technological, environmental, economic and political) to assist with the identification of internal and external drivers that may affect the organisation.
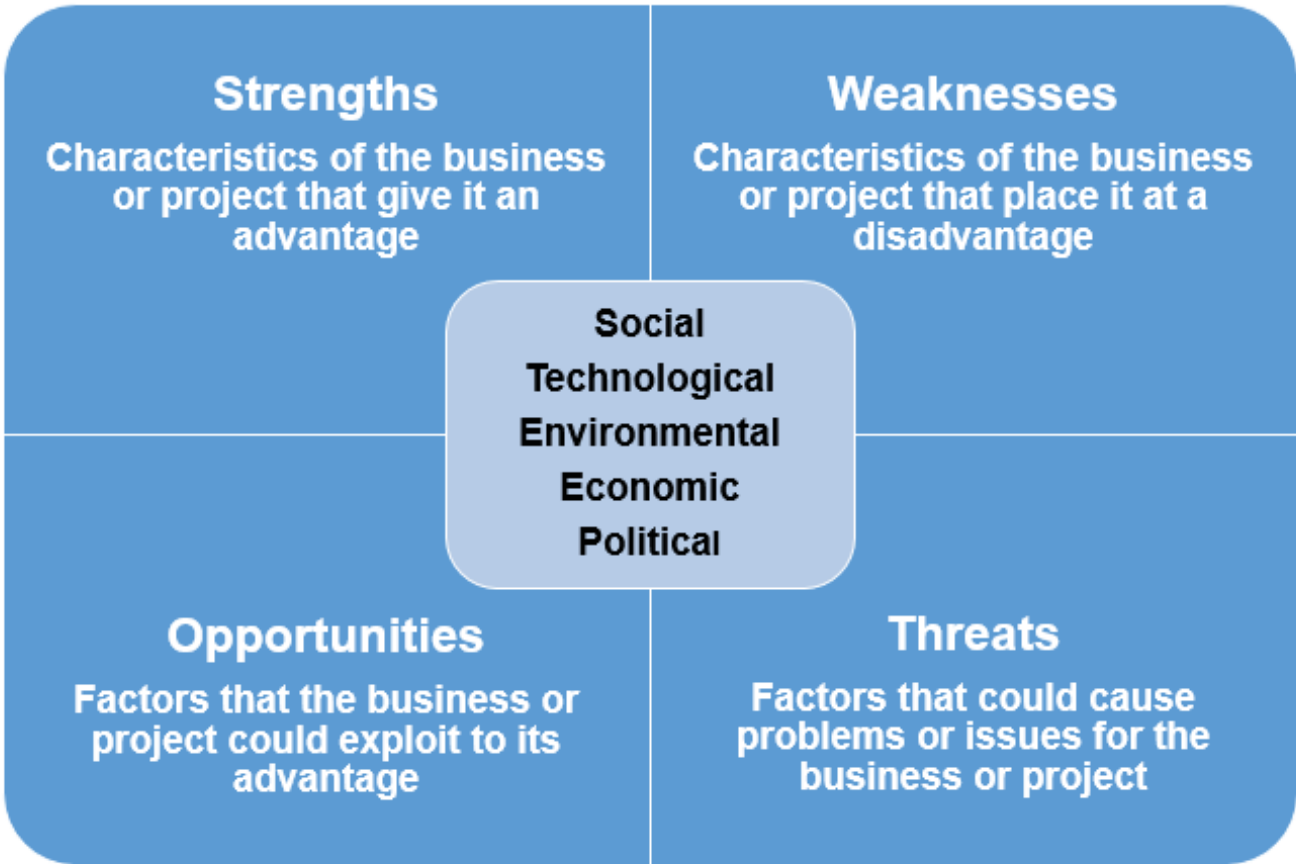
Figure 13: Strategic planning requires an understanding of the internal and external risks that may affect your objectives. A SWOT analysis is a structured way of determining this.

Something to think about

When was the last time you undertook a strategic risk assessment? Did you ensure all relevant stakeholders were involved? Did you use any specific tools or methodologies to assist you? How did the risk assessment add value to your organisation?

GATEWAY PROCESS

Water utility managers are constantly making decisions at every level, ranging from strategic decisions through to routine operational decisions. It is important that appropriate business structures and processes are in place that allow for effective and collaborative decision making. Effective decisions result from a systematic process, with clearly defined elements, that is followed in a distinct sequence of steps.

The impact of capital investment decisions can be significant. At the beginning of a project lifecycle there is the biggest opportunity to influence scope and cost. As the project lifecycle progresses, the cost of making a change increases significantly and the flexibility to make changes is decreased. Decision making structures must be established that allow for the correct investment decisions to be made early on in a project lifecycle.
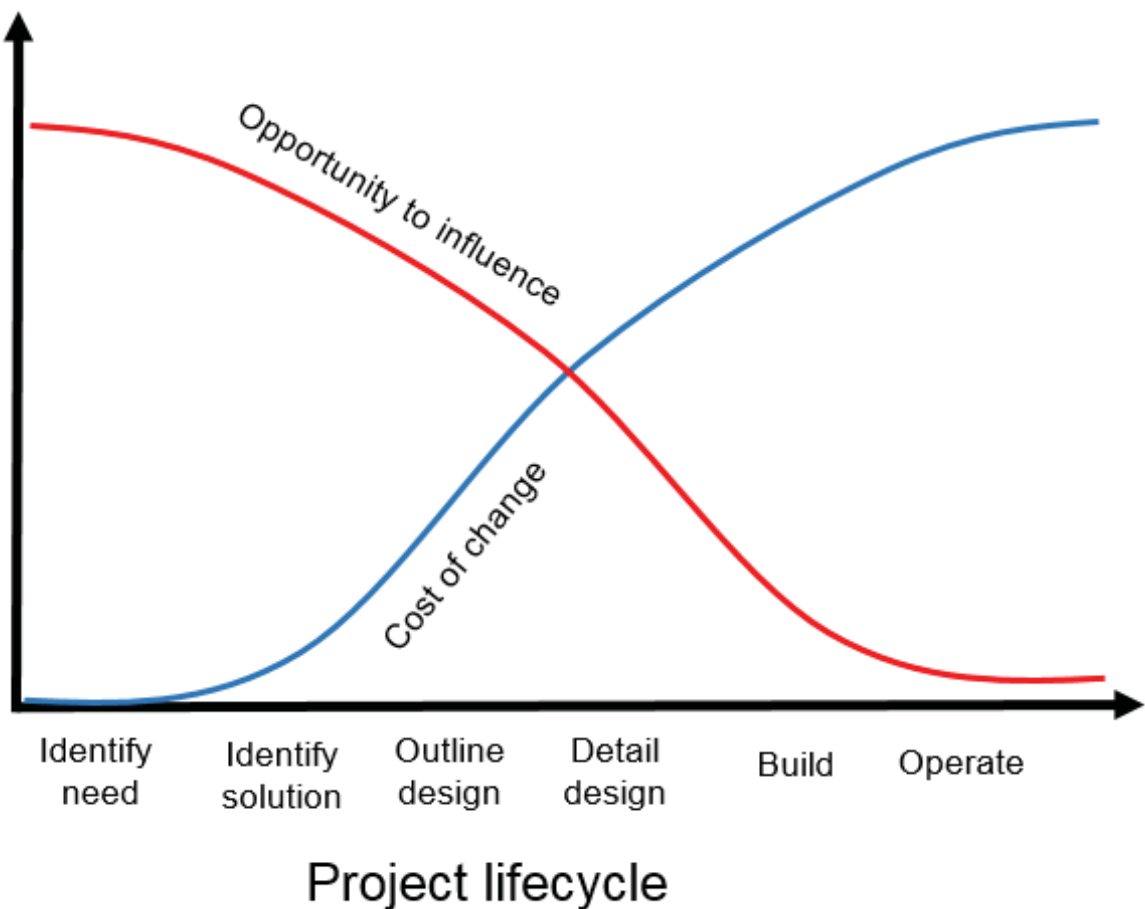
Figure 14: The opportunity to make changes are best right at the beginning of a project lifecycle. The cost to make changes increases significantly as the project progresses. Therefore it is important to have the right decision making processes to allow for the right choices to be made early.

One such process is called the gateway process, which is used for the identification, review, approval and implementation of capital investment. The gateway process allows for decision making at key points in a project lifecycle, incorporating a robust risk assessment at each stage. If the outcome of the risk assessment at each stage is acceptable, the project proceeds to the next stage.

There are typically six gateway stages.

Gateway 0 – This stage identifies the investment needs and justifies them based on an assessment of risk. This gateway therefore provides assurance that an investment need has been clearly articulated and quantified and does actually warrant further investigation or investment.

Gateway 1 – This gateway identifies potential solutions to the needs and confirms that the identified solutions present the best value for money, and in particular reduce the original risk to a suitable level, recognising that not all solutions reduce the risk equally. The outputs of any feasibility studies or solution optioneering would be presented at this gateway where a decision would be made as to which option was preferred based on risk reduction and whole life cost analysis.

Gateway 2 – The objective of this gateway is to get financial approval to release funds for the preferred solution to be implemented under a particular programme of work. Gateway 2 is often a high level committee of senior management and directors from across the business.

Gateway 3 – After a solution has been approved at gateway 2, it is implemented by an appropriate capital delivery partner, usually an in house engineering team or an external contractor. Gateway 3 is the next stage whereby the engineering designs are reviewed and approved. Once a design is approved, the solution is constructed and commissioned.

Gateway 4 – This gateway is held at the end of the commissioning period to check whether the project benefits have been realised and the project completed within time, cost and budget.

Gateway 5 – The final gateway is when key stakeholders undertake a post project appraisal to identify where things had been done well, where things had gone wrong and what could have been done differently. In particular, the original investment need and risk is reviewed to ensure the as built solution resolves the need and reduces the risk to acceptable levels.

Something to think about

How do you identify what needs capital investment and how is this capital approved? Do you use sound risk based tools or methodologies to assist you? Is the use of these tools and methodologies embedded into the decision making process or are they only used some of the time or on an ad hoc basis? How do you provide assurance that the decisions you make present the best value for money?
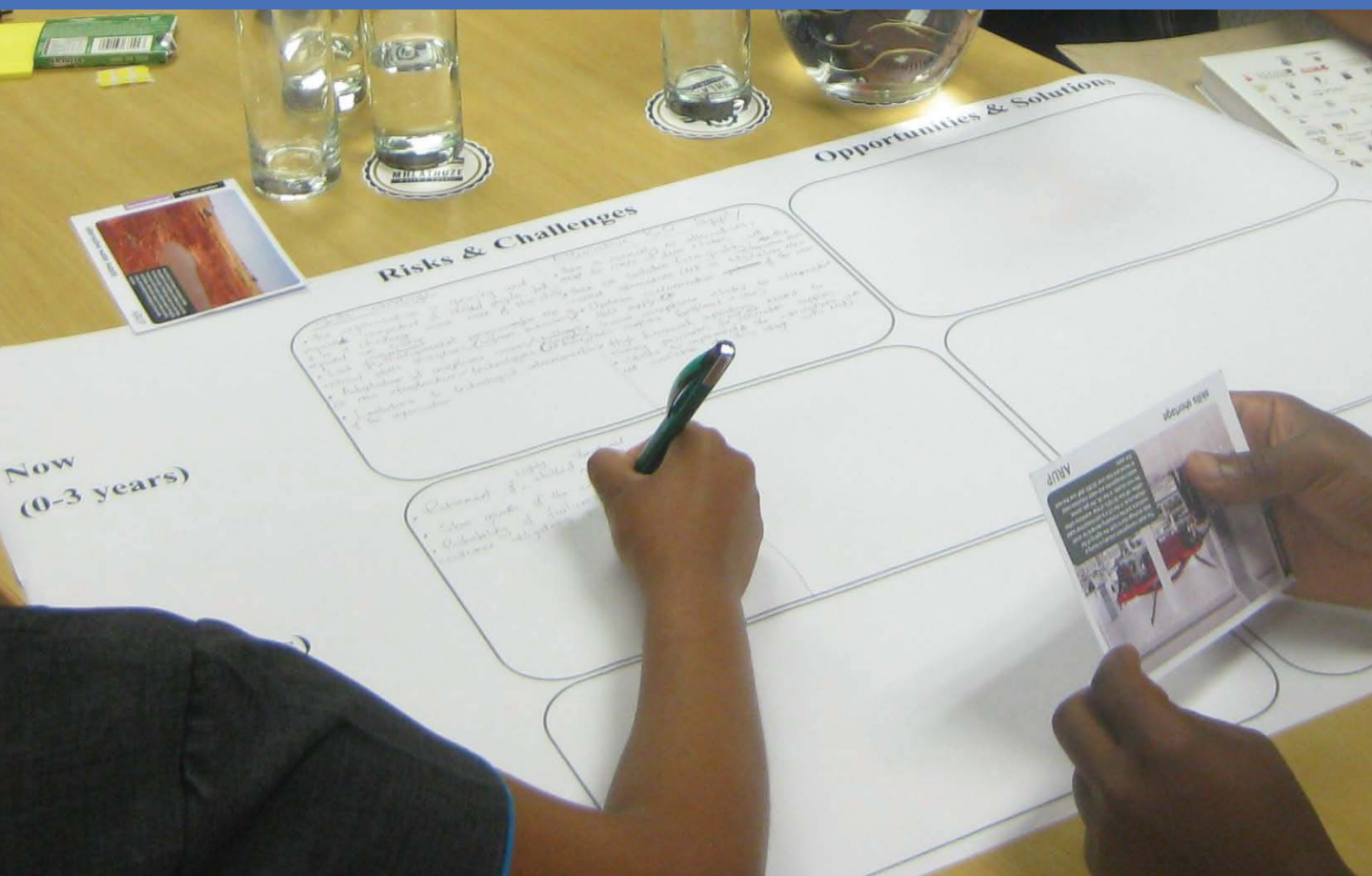
The table below summarises some of the commonly used risk based tools and methodologies used by water utilities in strategic, programme and operational decision making (MacGillivray et al., 2006; Pollard et al., 2004).

Hierarchy	Tools & methodologies
Strategic	Risk matrix & rankings
	SWOT analysis
	Scenario planning
	Net present value (NPV)
	Internal rate of return (IRR)
	Weighted average cost of capital (WACC)
	Gap analysis
	Financial models
	Benchmarking
Programme	Risk matrix & rankings
	Water safety plans
	Wastewater risk abatement plans
	GIS spatial mapping
	Hydraulic modelling
	Deterioration modelling
	Reliability modelling
	Water quality modelling
	Supply/demand water balance modelling
	Failure mode effect analysis (FMEA)

Hierarchy	Tools & methodologies
Operational	Risk matrix & ranking
	Checklists
	Failure mode effect analysis (FMEA)
	Hazard & operability assessment (HAZOP)
	Hazard & critical control point assessment (HACCP)
	Structured what if technique (SWIFT)
	Deterioration modelling
	Quantitative microbiological risk assessment
	Source – pathway – receptor models
	Bow tie analysis

BOX 5: RESILIENCE & BUSINESS CONTINUITY

There are many internal and external events that could have a material impact on a water utility. The impacts of drought, exchange rate fluctuation, aging infrastructure, economic and political uncertainty all affect a water utility. Many of these are outside the direct control of the organisation. Water utilities need to become resilient to these potential shocks and stresses. Resilience can be applied at various scales including the entire organisation, specific sites or assets. It can also be applied to people, processes and systems. The key attributes of a resilient organisation are:

Robustness – the ability to withstand stress or excess demand without loss of function, for example a sewer system that can accommodate a higher flow rate in the event of heavy rainfall.

Redundancy – they have backup in the event of failure, for example a water resource system that has various sources rather than just relying on one source; or having an appropriate spares inventory for critical components.

Resourcefulness – the ability to identify and implement solutions to emergency problems quickly and effectively, for example having a catchment wide water balance model that can be used to forecast a supply demand shortfall; or having a well designed and tested emergency recovery plan and a resourced and trained emergency recovery team.

Reliability – the ability to meet objectives in a timeous manner and in doing so reduce losses and recover functionality, for example having a backup power system that starts automatically when the power supply to a site is lost. Reliability of assets is often a function of good design and maintenance.

The complex interdependencies and shared vulnerabilities associated with modern infrastructure systems cannot be considered in isolation. Whilst your system may be well understood and resilient, other systems may not. This requires the development of community resilience, involving information sharing and communication comprising expertise from across multiple sectors and disciplines. Hence it is important to build cross functional relationships with external stakeholders, for example the district municipality, power provider, emergency services and catchment management agency. This sharing of risk is a new concept and will take leadership to really establish.

A business continuity plan is one way of helping to frame these issues and develop a way forward. A business continuity plan is a documented collection of procedures and information in readiness for use in the event of an incident to enable an organisation to continue to perform its critical activities to an acceptable service level. It differs from an emergency response plan in that it defines the medium term actions needing to occur after the emergency has been resolved. ISO22301:2012 identifies the components of a typical business continuity plan.
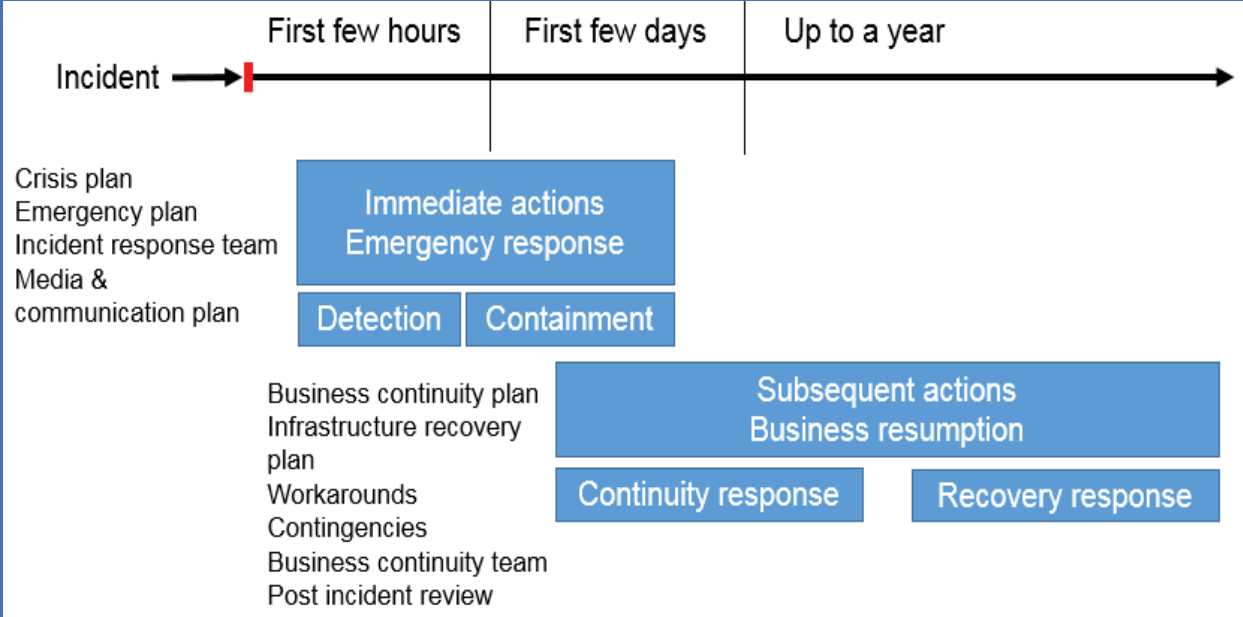
Figure 15: An emergency response plan guides the immediate emergency response actions, whereas a business continuity plan guides the subsequent actions months after the incident.

Something to think about

Think about a catastrophic event that may occur. How would your water utility cope with this? Do you have an emergency response plan to guide what needs to be done during the incident and immediately afterwards? How would you be coping a few days or weeks later? Consider what interventions you could put in place now to become more resilient to shocks and stresses. Consider developing a business continuity plan to supplement your emergency response plans.

YOUR NOTES

Chapter 4

Building a Risk Culture

The culture of an organisation significantly influences risk governance. Culture is the collective mind set, behaviours, values and beliefs that influence actions and decisions (Schein, 2004). Good risk governance is a state of mind amongst all employees. So while risk management is important, it needs to be embedded within a wider supportive organisational culture to become sustained. Even with the best risk management procedures in place, risk will not get managed unless organisations and individuals take ownership of the issues and are held accountable.

THE IMPORTANCE OF LEADERSHIP

Leadership plays a critical role in shaping the culture by setting the right tone from the top, leading by example, providing inspiration and driving and managing behaviours and performance of teams and individuals. Good leadership is instrumental in creating a mindful culture that supports sound risk governance, as leaders have the power to influence aspects of culture across the entire organisation and effect the necessary change. In addition, leadership influences the risks an organisation is willing to take, the direction the organisation will follow to meet its business objectives and the performance characteristics of the organisation.

Good leadership can foster an enabling environment that supports and encourages a risk aware culture based on openness, transparency, collaboration, learning and mindfulness. While the specific attributes of leadership that promote cultural change are not easy to predict and vary in different contexts, the literature highlights the importance of the following factors (Herrick et al., 2013):

- Ability to establish a vision and direction and communicate this effectively.
- Aligning, motivating and inspiring people to achieve the vision.
- Ability to strategically problem solve.
- Ability to embrace a reflective and adaptive style of decision making.
- Ability to frame a narrative that tells a story about the importance of risk practices and related organisational changes in a language that a broad range of stakeholders can understand.
- Has a participatory rather than directive style.
- Ability to allocate resources appropriately.

Figure 16: Organisational culture is a complex phenomenon but it is vital to get the culture right to allow for sound risk governance to become established. The aim is to get everyone to be a risk manager through awareness, attitude and behaviour (Adapted from Johnson, 1992).

FOSTERING A CULTURE OF MINDFULNESS

A risk aware and mindful culture will help establish a good first line of defence. Best in class water utilities are mindful about risks to their operations and continuously seek for opportunities to improve, learn and change, whilst anticipating potential impacts, incidents, failures and hazards. Various things contribute to creating a mindful organisation such as an effective reporting culture, integration and cooperation among departments and the open and transparent sharing of information. In a mindful organisation, everyone is a risk manager and everyone considers risks and their root causes in all they do. Such behaviour is embedded into business activities, operating procedures, reporting systems and performance management.

There are a number of recommendations that leadership and the risk manager within a water utility can adopt when developing a mindful culture (Hrurdey et al., 2006):

- There must be a positive and consistent message and managers must be seen to be actively driving the agenda and implementing the policy.
- The human and cultural perceptions of risk across the organisation must be understood and taken into account.
- The capabilities and intentions of internal and external people must be considered.
- Informed vigilance is actively promoted and rewarded.
- The entire water system, its challenges and limitations, must be fully understood.
- Operational personnel are afforded the status, training and remuneration commensurate with their responsibilities as guardians of the public's health.
- There is continual learning from past events and incidents, with the open and honest sharing of information.
- Local champions are embedded in each team that communicate and coordinate risk related activities and ensure that risk is a part of everything everyone does.
- Recognition of the importance of process controllers, site supervisors and team leaders as they are the ones at the front line of operations and are engaging with operators and assets each and every day.

The development of a mindful culture will require incentives to ensure employees stay committed to their job and always want to do the right things. Good people don't usually do bad things, it's their working environment and a lack of support structures that may result in bad things happening. Employees that have an emotional attachment to their role or the organisation and feel committed to what the organisation does, are usually more motivated to do the right things. Managers and leaders must foster this type of working environment by letting people know the importance of their roles in protecting public health, giving them responsibility, providing the tools they need to do their jobs easily and enhancing their working environment. Only then will a water utility be able to build a risk aware and mindful culture.

Something to think about

What kind of culture do you have in your water utility? Does everyone always think about the risks associated with what they do or the decisions they make? Do you feel comfortable speaking up if you see something happening (or not happening) that may pose a risk? How seriously does your manager take health and safety of the team? What can you do to improve the awareness of risk with your peers and your managers?

PEOPLE & THE PROCESS OF CHANGE

The people in an organisation is the most important factor determining the success of risk governance. The right people with the right skills, attitude and behaviour need to be in place, they need to be trained to do their jobs and provided with the appropriate resources, tools and remuneration. Importantly they need to be well managed.

A water utility just starting on its risk governance journey may require considerable changes to the way the organisation and its people work. This will be especially true if the current culture of the organisation is not one of mindfulness, awareness, sharing and learning. Leadership plays a significant role in setting the change agenda and then driving this to completion. The following factors can influence the effectiveness of a change programme (Johnson, 1992; Kotter, 1995):

- Risk management and governance needs to be highlighted as a priority and must have the full support of leadership, who actively get involved.
- A vision and policy is needed to ensure a clear message is communicated to all employees.
- Develop an influential coalition that can provide strategic support, guidance and influence, and has the necessary authority to make changes.
- Remember that change can be daunting for some, and appropriate support needs to be provided to build people's confidence, trust and capabilities.
- Determine what may be blocking successful risk governance from happening and try resolve these first.
- Implement quick wins first and then communicate and celebrate these widely. This will start to build confidence and support.
- Ensure change is anchored in the organisational culture by embedding values and behaviours into operating procedures, key performance indicators and performance reviews.

Something to think about

Think about a recent major change in your organisation, for example the installation of a new IT system or the reorganisation of a department. How did this go? Where the risks of this change identified, communicated and managed before the change occurred? How could it have been done differently or better? As risk is most pronounced when change occurs, it's important to have a formal change management procedure that explicitly considers risk.

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Chapter 5

Guiding Principles

Below are a few guiding principles that all water utility managers, risk managers and employees need to consider when undertaking their roles. (Adapted from Water Research Foundation, 2013).

Impose no more risk than you would accept yourself – This principle ensures employees do not completely detach themselves from the decisions they make. Always remember that the decisions you make will have an impact on the environment and public health. Put yourself in your stakeholder's position to try and see what the impact of your decision may be.

Do more good than harm – The ultimate goal of risk management should be to limit or prevent harm, and therefore you should always strive to do more good than harm. If you are uncertain about the potential negative effects of a decision then rather be precautionary.

Be fair, honest and open – We live in a civil and democratic society, and the public expects water utilities to act fairly and honestly. This means regularly consulting and communicating with all stakeholders, sharing of risk information and ensuring openness and transparency in decision making. Do not create expectations that realistically cannot be achieved. Ensure you understand the limitations of what can be done and what risk management can achieve.

Ensure an equitable distribution of risk – The public expects equality of services and conduct. It's important to understand and manage risks across the full spectrum of what you do as an organisation, and do not focus on certain issues only or risks that affect certain stakeholders only. Equality is difficult to achieve and absolute equality of risk between all stakeholders will not be possible, however a meaningful understanding of the risk distribution and a balance needs to be found. This needs to be shared in a fair, honest and open manner.

Use limited resources optimally – Water utility management and indeed risk management requires the use of finite resources, such as people, intellect, time, tools, systems and budgets. To use these effectively requires sound decision making that allocates these resources to areas that need them the most and will achieve the most benefit.

Adopt the Pareto Principle – The Pareto Principle states that a small proportion of the full effort (20%) is generally required to achieve close to the desired result (80%), and that further efforts are subject to diminishing returns. This approach is often valid for risk management activities whereby a first order assessment can be used to rapidly determine the most critical issues. Implementation of the first steps to resolve these issues can lead to significant improvements.

Develop approaches that work for you – All organisations are different with different needs, objectives and stakeholders. Importantly the internal and external contexts are also different. Therefore risk governance activities must be tailored to suit your context. The standards and guidelines, including this one, provide a generic approach. There is no single correct way of implementing risk governance. Ensure you consult widely to incorporate the views of all stakeholders when developing your risk governance approach.

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Chapter 6

The Journey to Excellence

A challenge for all water utilities is to promote sound risk management practices within the wider concept of good risk and corporate governance. These are organisational competencies that need to mature and develop over time. By having a structured approach and starting small, water utilities can incrementally improve their capability, aligning their risk governance improvements with their organisational growth and development. The following are some of the first steps that need to be taken on the journey to excellence.

GAINING SUPPORT

Before the journey starts there will need to be support from executive leadership. They must be enthusiastic and committed to support the process and provide the necessary resources. Continuity of this support is vital and if the leadership changes whilst on the journey, it is important to ensure the improvements and momentum achieved are not lost.

Given that the management of risk is a legislative requirement, it's likely that leadership will already have some understanding of the need for risk governance, and may well have already established some function in the organisation. However gaining support from executive leadership may be challenging, particularly if they believe that risk governance is not important or that they are already undertaking it to a satisfactory level. A few arguments that may get support include (Summerill et al., 2011):

- Emphasize that the management of risk is a legal requirement and the executive leadership are accountable for this.
- Emphasize the reputational and liability impact from a major waterborne disease outbreak or a major pollution incident. In some cases this could result in dismissal or a criminal conviction. Someone will be accountable and it is usually someone on the Board or in the executive leadership team.
- Highlight the potential personal implications of an event for an individual, their families or peers.
- Highlight the importance of proactive management and that implementing better risk governance activities will contribute to this.
- Discuss the value to the water utility from better risk governance practices, including achieving organisational objectives, improved operational performance, compliance with regulations and better stakeholder trust.
- Sound risk governance can provide some protection for executive leadership in the event of adverse outcomes. Firstly, outcomes may not be as severe as they might otherwise have been. Secondly, those accountable can, in their defence, demonstrate that they have exercised a proper level of diligence.

BUILD ON EXISTING GOOD PRACTICE

It is very likely that elements of good risk management have already been adopted in your organisation for particular categories of risk. One such area is likely to be water safety plans and wastewater risk abatement plans as these plans are a requirement of the compulsory Blue Drop and Green Drop regulatory programme. Water utilities that have implemented these plans can demonstrate significant improvements in water quality and effluent quality. Other benefits could include:

- A better understanding of the entire water system from source to tap, and how all the elements interact.
- Identification of hazards and contributing factors that may lead to an incident or a risk in the future.
- A proactive approach to manage the water system rather than a reactive approach.
- Reduction in operational incidents.
- Identification of a capital maintenance plan that explicitly addresses high risk items and therefore allocates scarce funding appropriately.
- An improvement in your Blue Drop or Green Drop score, which provides assurance to customers and the Department of Water and Sanitation that the water system is being managed properly.

There may well be others parts of the organisation that also practice good risk management. You will need to identify where pockets of good practice are being done, understand the value this adds and determine what makes it work. Use this information to showcase to the organisation, in particular executive leadership, that good risk management does provide value. Build on this good practice and roll it out to other parts of the organisation.

Something to think about

Do you have a water safety plan or a wastewater risk abatement plan? How is the plan used to make risk based decisions? Who in the organisation is involved in the development and implementation of the plan? How is the plan communicated? What are the benefits of having these plans, and have these been communicated? Think about ways that these risk based approaches and principles can be replicated in other parts of the organisation.

SETTING A VISION

Once there is support from leadership, a vision needs to be set. This is often in the form of a policy, which needs to be established and communicated. The existence of a policy will not guarantee that the organisation improves the way it manages risk. The policy needs to become "alive" and actively implemented. The development of a risk management framework and implementation plan is crucial to operationalise the policy. The framework needs to be fit for purpose and must be developed after consideration of the internal and external context of the organisation (see box 3).

It might be worthwhile carrying out a benchmarking activity to see what level of maturity the organisation is currently at, compare this to what your vision is, and then identify gaps that can be addressed in the future (see box 6). Over time, a step by step improvement can be made that will result in more integrated and robust processes, effective knowledge management and an embedded risk culture across every sphere of the organisation.

Figure 17: It is important to recognise and celebrate when things go well, such as the achievement of a Blue Drop or Green Drop. Use this as inspiration to continue on your journey to excellence in other parts of the organisation.

Something to think about

Implementation of good risk governance will take some time, and will need ongoing commitment from executive leadership. An implementation plan is critical to outline the steps needed and who is responsible for each step. Give priority to those changes that will have the biggest impact on achieving your objectives. The implementation can occur in stages as you grow in maturity. Consider implementing the changes together with other change programmes that may be underway. Ensure you regularly monitor the implementation plan to ensure it is working.

BOX 6: BENCHMARKING & CONTINUOUS IMPROVEMENT

Benchmarking is the process of measuring, comparing and tracking organisational performance relative to a best practice standard or a comparison with best in class organisations. Benchmarking is a useful management tool to identify where your organisation is and what needs to happen in the future to improve. It doesn't matter if your water utility is new to risk governance or you are well established, a benchmarking exercise could be very useful.

There are a number of risk benchmarking tools available for the water sector, with the one developed by the Water Research Commission (2016) appropriate to the South African water service sector.
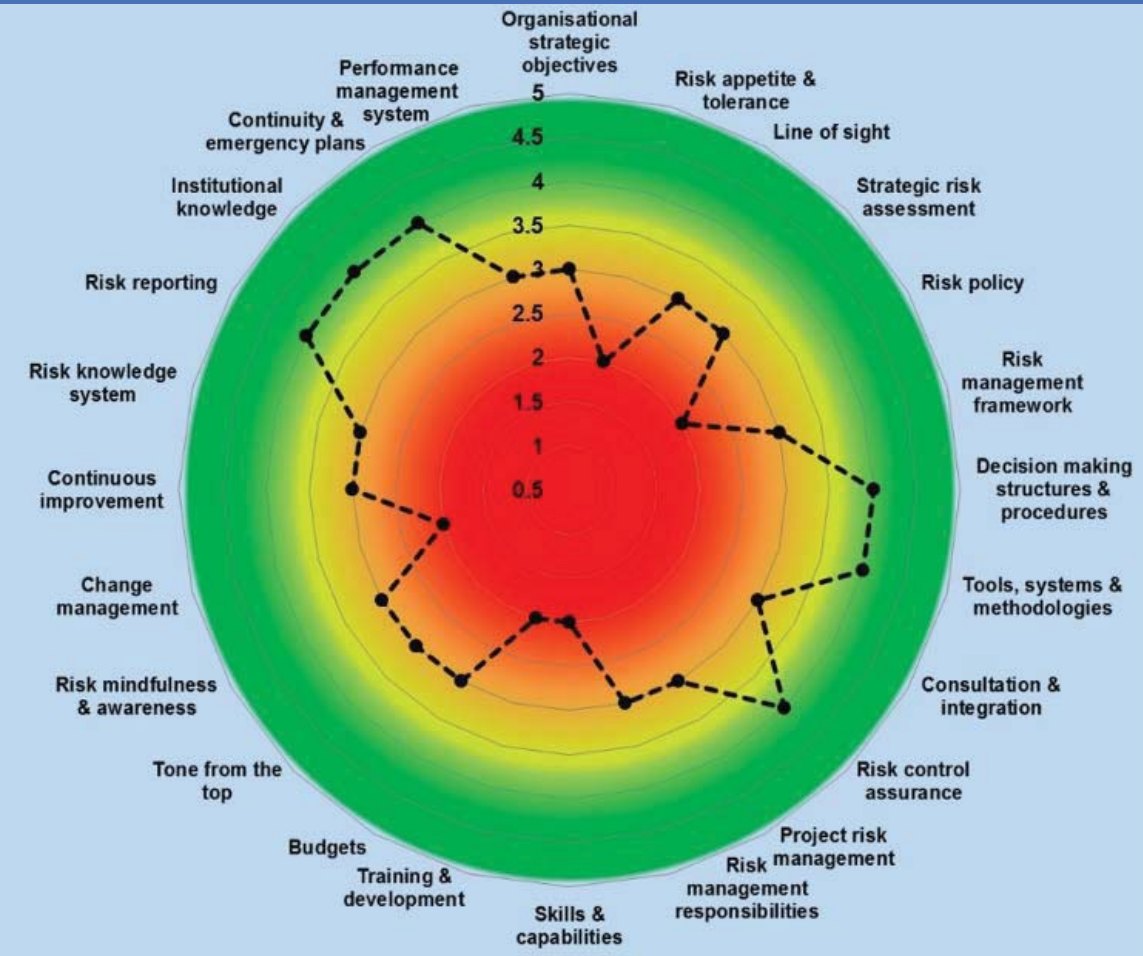
Figure 18: Benchmarking can identify areas of good practice and areas that need improving by comparing your organisation to a best practice standard.
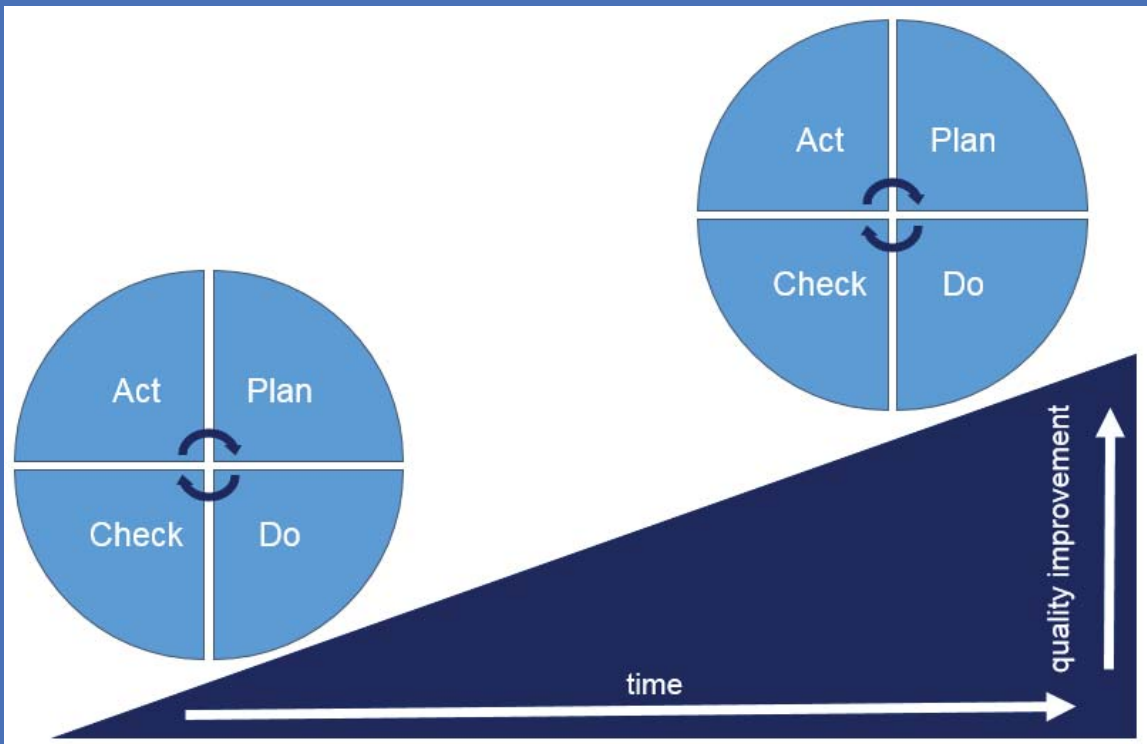
Figure 19: The plan do check act model can be used to drive continuous improvement.
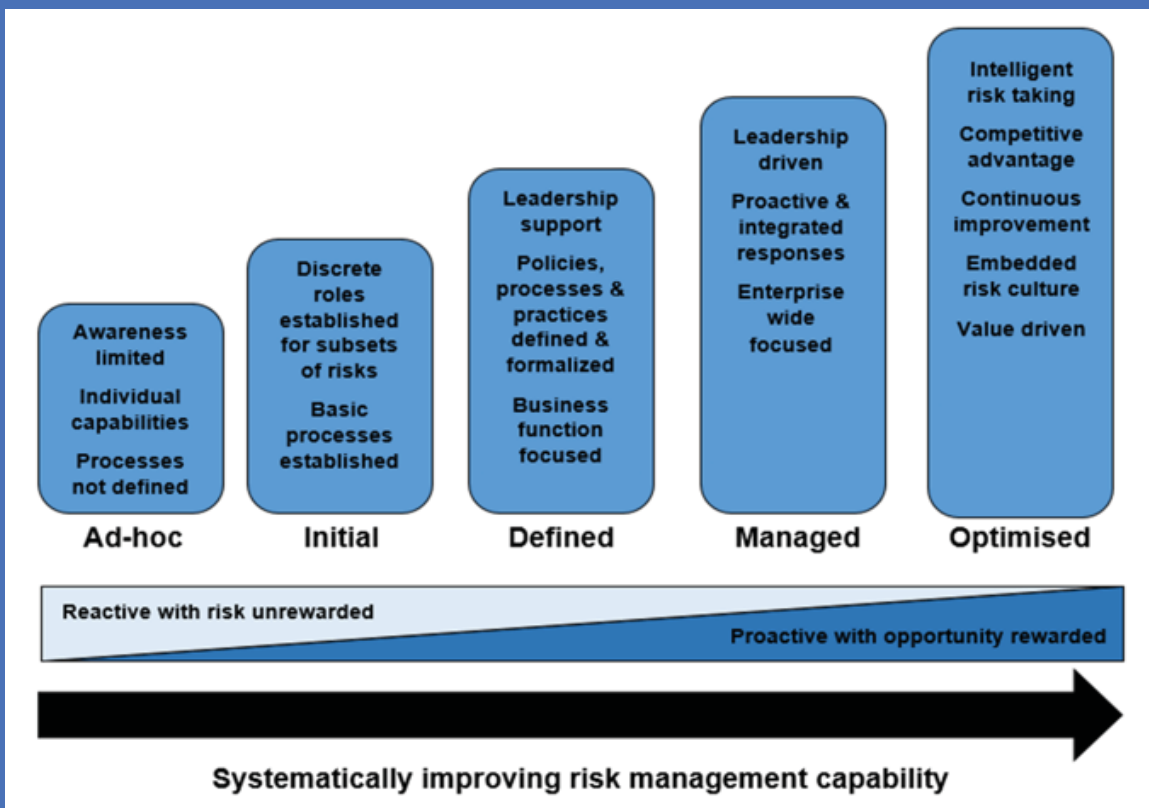
Figure 20: The outputs of a benchmarking activity can be used to develop an improvement plan, and in doing so drive continuous improvement in your organisations risk governance capability (Adapted from Pollard, 2014).

The risk maturity level characteristics of an organisation are described in the table below. Which level of maturity do you think your organisation is at? Where would you like to be? Why don't you benchmark yourself to find out?

Maturity level	Characteristics
Level 1 ad hoc	Unaware of the need for and benefits of risk management; limited or no awareness of standards and guidelines; ad hoc approach with no defined processes or procedures in place; reliant on individual capabilities for identification and management of risks; entirely reactive approach taking each challenge as it comes; little or no management support; highly vulnerable to change.
Level 2 initial	Recognition of the need for and benefits of risk management; some processes or procedures are in place; discrete roles established for sub sets of risks in teams or departments; reliance on people is reduced; risk management is narrow in scope and still mainly reactive; restricted to meeting regulatory requirements; limited performance monitoring; some management support; vulnerable to change.
Level 3 defined	Defined and formalised policies, processes and procedures in place across the organisation but still business function orientated; risks are routinely identified, analysed, treated and monitored; combination of reactive and proactive; adequate training, budgets and tools are in place to support risk management activities; some performance monitoring and feedback mechanisms but still restricted in the ability to adapt and learn; established management support; less vulnerable to change.

Maturity level	Characteristics
Level 4 managed	Risks identified, analysed, treated and monitored at an enterprise level with processes, procedures and systems in place to work across all functional boundaries; integrated response to events; systems and performance metrics are in place to evaluate the effectiveness of the risk management system; data actively used to improve business processes and provide assurance; key stakeholders are consulted and involved in decision making; a risk aware culture is becoming established; more proactive then reactive; management driven; some inflexibility limits the capacity for deeper learning and collaboration.
Level 5 optimised	Proactive, intelligent risk taking whereby opportunities are rewarded; using the risk management system as competitive advantage; driving continuous improvement and adding value; embedded risk culture whereby everyone is a risk manager; risk management is a central part of all business activities and decision making with risk management happening all the time; adaptability and flexibility; attention to organisational culture, human behaviour and learning in which the organisation and its people are always improving; collaborative partnerships with internal and external stakeholders and there is open shared learning; leadership driven.

SECURING THE RIGHT PEOPLE

Adequate human resources capacity, represented by the requisite number of people with the right skills, is fundamental to implementing risk governance. A water utility should ensure that there is accountability, authority and appropriate competence for managing risk, and this is defined and recorded. The size and scale of water utilities will vary and not all will have the resources or capacity to support a large risk team. At the very least an organisation needs to have an enterprise wide risk manager (see box 7). Other employees with other core responsibilities can also become engaged with risk governance functions, such as a risk champion or coordinator. Many water utilities are using risk champions and coordinators that are embedded into specific departments and teams. They assist with the collection, analysis and reporting of risk information before it is escalated and integrated at a higher level in the organisation.

A risk champion is usually someone who is well known, has some authority amongst their peers and who has the ability to influence others, and hence is often a manager. The role typically involves the promotion of risk governance within their departments and teams, building relationships with senior management and understanding a wider perspective of risk, over and above what their traditional role may have required.

The risk coordinator role has a different focus. They will typically be responsible for:

- Facilitating the completion, review and updating of the risk register.
- Communicating messages about risk to their team or department.
- Assisting with risk reporting.
- Acting as a local ambassador and point of contact.
- Ensuring consistency in the application of the risk policy, framework, procedures and guidelines.
- Providing risk awareness training to employees.

For this to be effective, their responsibilities need to be explicitly documented in a standard operating procedure, a job description and reviewed at a performance appraisal. In reality risk management needs to be part of everyone's job and not just the responsibility of a risk manager, risk champion or risk coordinator.

Other important factors to consider when securing people resources include:

- Identify risk and control owners that have the accountability and authority to manage risks. Ensure these are recorded in the risk register and job descriptions.
- Ensure people with risk responsibilities have the relevant qualifications, capabilities and skills to fulfil their responsibilities.
- Undertake formalised skills and capability benchmarking to identify the skills the water utility needs compared to the skills its employees have. Use the findings of this benchmarking to develop and implement a training and capacity building programme.
- Ensure all employees are aware of the existence of policies, frameworks, procedures, guidelines, systems and tools relevant to their position.
- Ensure operational personnel have the status, training and remuneration commensurate with their responsibilities as guardians of the public's health.
- Establish a risk aware culture. Ensure all staff but particularly operators, process controllers and laboratory staff are entrusted with protecting public health and the environment and must be committed to honouring this responsibility above all else.
- Empower employees to make sound risk based decisions but also ensure they know when to refer up to a more senior manager for a decision when this is required.

BOX 7: THE ROLE OF THE RISK MANAGER

The role of risk manager is an important role to have. The role is demanding and very broad as it requires an understanding and oversight of risks and opportunities across many business functions. The role within a municipality is even more challenging as the functions of a municipality are wide ranging and do not just focus on water services. As a risk manager there are a number of things you will need to master to be successful in your role:

- Engage with the Board or executive leadership team early on, and ensure regular engagement with them. Clarify lines of reporting and authority; and gain support at the highest level. It will be important to develop good communication skills, advocacy skills and the ability to assert soft power. Without this you may find it difficult to influence the strategic agenda or deliver difficult but critical messages.
- Have a clear understanding of your power because it will be regularly tested. Ensure you build relationships based on trust and mutual respect, and don't be seen as taking sides with anyone. Your role is to be impartial and honest.
- Develop a risk management framework that includes a capability maturity improvement process. Use this process to grow and develop the risk governance capabilities of the organisation over time.
- Encourage the fostering of a learning organisation, one that reviews and documents close calls and near misses, learns from past events and uses this information to become better.
- Remember risk management is all about improving decision making. Establish processes and systems to gather and manage risk data that can be used to support and improve the decisions the water utility makes. This needs to extend beyond just the risk register or a water safety plan.
- You will need to interpret a range of information from various sources, and then use this to develop knowledge about risk and opportunity. You will need to convert this knowledge into business plans, strategies and actions that can be easily understood and are pragmatic.
- Be creative, strategic and forward looking. Look for areas of good practice or existing programmes that can be joined to leverage support and resources.
- Risk management needs to be in the context of an organisational objective, therefore it is important that employees know what the organisational priorities and objectives are and they understand the impact of their actions on these objectives. Ensure that the benefits of risk management are clearly articulated and communicated to all employees and that the messages are clear and consistent.

ESTABLISHING PROCESSES

The work of departments, business units, working groups and committees should be structured and coordinated in a way that provides a complete perspective of the water utilities risk exposure and allows for effective cross functional working and decision making. Senior management needs to ensure such processes are established and maintained.

The risk manager will be responsible for the development of a process and system to capture and manage risk data and information. This will need to be made available to the right people at the right time to support decision making. This process needs to ensure both vertical integration up and down the organisational structure as well as horizontal integration across business functions. This process will be defined in the risk management framework and supported by an information management system such as a risk register.
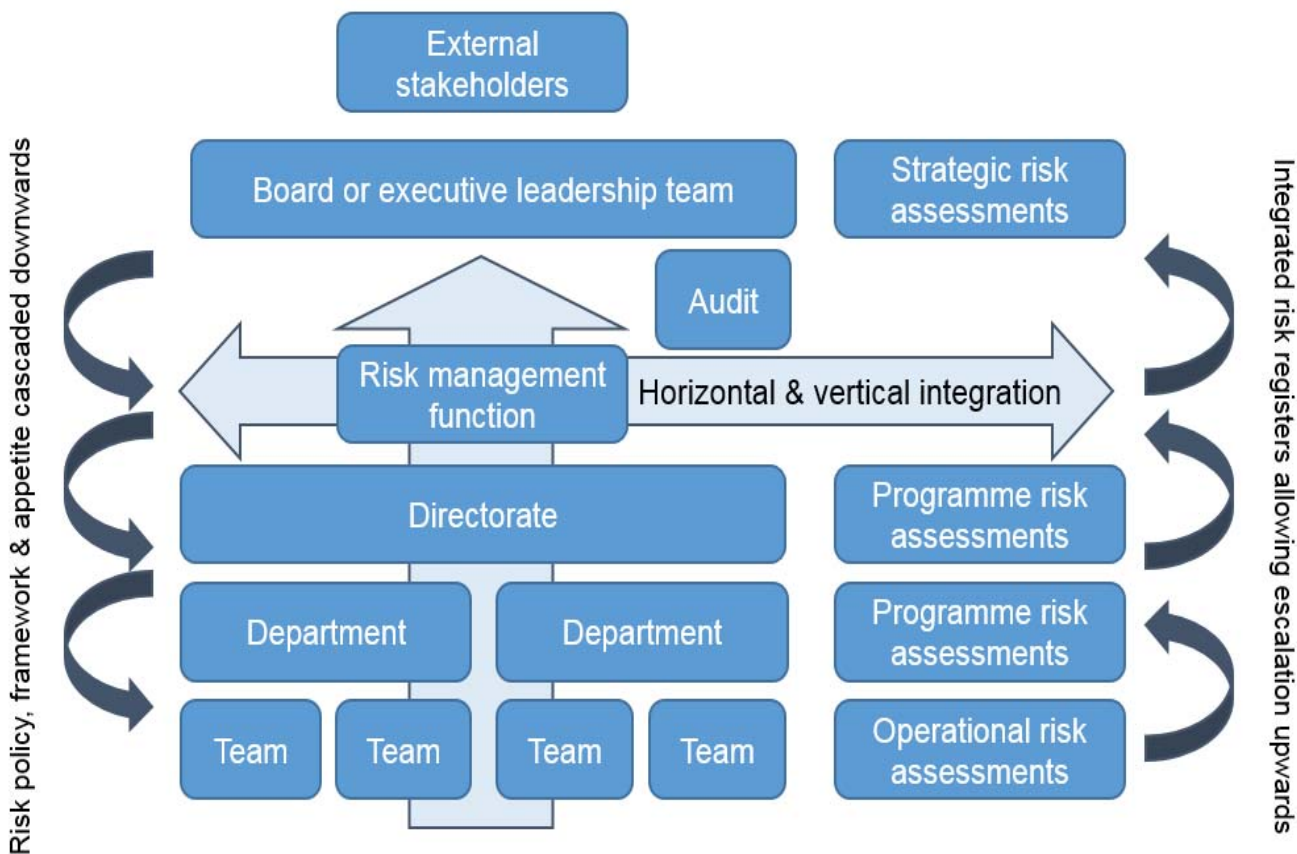
Figure 21: The risk function needs to be at an enterprise level to facilitate horizontal and vertical integration of risk management within the organisation.

An important process to establish will be the reporting cycle. This will ensure there is regular and formalised reporting of risk information to relevant stakeholders. The reporting cycle will ensure a rhythm of capturing, assessing and reporting of risks, the upward cascading of risks and the integration of operational, programme and strategic risks. It would assist greatly if the risk register and other business reports were designed to allow for easy reporting aligned to the reporting cycle. A few examples of reporting that may be applicable to a water utility include:

- Monthly or quarterly department risk reports.
- Reporting quarterly to the risk or audit committee.
- Annual report to shareholders and insurers.
- Project specific risk reports.
- Annual business strategy or planning reports.

As most water utilities will already have been in operation for some time, it's likely that established operational, programme and strategic level business processes will be in place. In some cases these may be fairly simple, whilst in larger water utilities these may be complex. A risk manager will need to understand these processes, where the information comes from, how it is analysed, who uses it and what criteria are used to make decisions. These processes need to be defined and documented.

One of the main requirements of a risk manager is to work across multiple functions. Use this to your advantage and establish good cross functional working arrangements and processes between different teams and departments. A risk manager has the ability to bring teams together, break down silos and facilitate sharing of risk information. Work with these teams to develop business and decision making processes that provide mutual benefit. Such cross functional working can yield significant benefits to a water utility as it reduces duplication, identifies systemic and interdependent risks, allocates resources more effectively and builds trust and teamwork.

Care needs to be taken to prevent significant disruption when recommending changes or alterations to existing processes. By building good relationships with key allies and senior managers, a risk manager will be in a more favourable position to implement changes that would improve the way risks are managed. Always remember, when done well, risk governance will enhance and support decision making at all levels in the organisation, rather than be a "tick the box exercise". This can free up time and resources, improve communication, break down silo working and drive real value in the organisation.

MEASURING & MANAGING PERFORMANCE

So you have a risk policy and framework, a risk manager and champions, a risk register and you undertake risk assessments, but how do you know this is enough and it is really adding value? Monitoring of the risk management system is vital to ensure the system is fit for purpose and delivering suitable benefits. A performance management system needs to be established that:

- Ensures controls are effective in both design and operation.
- Identifies new and emerging risks.
- Can detect changes to the internal and external context of the organisation.
- Documents and reviews near misses and learns from past events, both good and bad.
- Monitors progress of risk treatment plans to ensure they are in place on time and to budget.
- Tracks residual risk and how this may change over time.
- Benchmarks your organisation periodically against other best in class organisations or a standard.

Key performance indicators need to be established and regularly monitored. It is best to use a mix of hard and soft indicators as this will provide a wider range of assurance (Spencer Picket, 2005). Here are some suggested key performance indicators that could be used to assess risk management performance in a water utility:

- Is there are risk policy and framework and is it regularly reviewed and updated?
- Are there defined roles and responsibilities for risk management and are all these roles filled?
- Are these responsibilities incorporated into job descriptions and employee performance appraisals?
- What is the coverage of water safety plans and wastewater risk abatement plans?
- What is the change in Blue Drop, Green Drop and No Drop risk scores year on year?
- Are unidentified risks becoming realised?
- Are risks that you thought were under control becoming realised?
- How often and how do senior management actively support the risk agenda?
- Are risk treatment plans completed on time and to budget?
- Is the water utility, or one of its departments or teams regularly missing its targets or not meeting its objectives?
- What is the change in the overall risk portfolio year on year – are some risks always on the risk register and never leave?
- Is risk reporting compliant with the risk management framework?
- Is residual risk after risk treatment within the risk tolerance threshold?
- What is the change in your insurance costs year on year?
- What is the year on year tend in the number of near misses or minor incidents?
- What is your spend on risk management activities, including training?
- What is the year on year change in the Auditor General findings?

Something to think about

Do you undertake a root cause analysis after an event or incident? If you do, how is this information captured, stored and shared? Have you considered doing a root cause analysis after something was done well? This could help you identify what contributed to the success and may inspire you to duplicate this good practice elsewhere.

DEVELOPING COMPETENCIES

The training and development of people is an important requirement to ensure a water utility improves its risk governance capabilities. Water utilities that are advanced in their risk governance abilities dedicate time and resources to this. The skills and capabilities required will differ depending on the role and therefore specific programmes must be developed that are applicable to the role. Some of the skills and capabilities to promote in employees include:

- An understanding of the organisational strategic objectives, the departmental or team objectives; and what this means for the individual and their role. This can be achieved by having these objectives documented in employee job descriptions and performance appraisals.
- An understanding of the risk policy and framework. Employees must have access to these documents and need to be made aware of them at inductions. It is recommended to undertake periodic roadshows to operational sites to ensure the messages are clear.
- An understanding of role specific guidelines and procedures. Employees must have access to these documents and need to be made aware of them at inductions. It is recommended to undertake training of employees to ensure they understand what they need to do in their roles.
- The ability to make risk based decisions, including understanding the risk appetite, selecting appropriate risk treatment options, making trade-offs, understanding residual risk and communicating about risk to stakeholders.
- Developing an understanding of the system perspective and how incidents occur, what contributes to this and what can be done to prevent this.

Something to think about

How does your water utility identify emerging risks? Do you have systems in place to provide warning that a situation is changing and in time may turn into a problem? In day to day operations, employees and managers are often focused on routine activities and there may be no time to identify emerging issues or new risks inside and outside their operating sphere. The challenge for an organisation is having a system in place to quickly and routinely identify indicators and assess developing conditions to allow action before they become a problem.

CHECKLIST FOR IMPLEMENTING RISK GOVERNANCE

The list below provides an overview of the steps involved when implementing a risk governance initiative. Successful implementation is an ongoing process that will require continuous review and revision.

1. Identify and quantify the benefits that risk governance can provide your organisation. ☐

2. Identify areas of existing good practice and use these as examples of where risk governance can add value. ☐

3. Celebrate the good practice throughout your organisation and especially with the executive leadership. ☐

4. Secure support, commitment and mandate from executive leadership. Find an executive sponsor to provide ongoing support. ☐

5. Establish a focal point for risk governance at an enterprise level including a risk committee and a risk manager. ☐

6. Undertake a benchmarking activity to better understand your current risk maturity and to identify areas for improvement. ☐

7. Plan the scope of the risk governance system including internal and external context and stakeholder expectations. ☐

8. Engage with executive leadership and identify and quantify risk appetite and tolerance for each category of risk. ☐

9. Establish a risk governance policy (including a risk appetite and tolerance statement) that is approved by the executive leadership. ☐

10. Establish a risk governance strategy, framework or plan that is detailed enough to operationalise the policy. ☐

11. Ensure the risk governance structures are integrated into existing corporate governance structures in the organisation. ☐

12. Establish roles and responsibilities in departments for aspects of risk governance including risk champions and coordinators. ☐

13. Communicate the policy and strategy, framework or plan widely to all relevant stakeholders, using risk champions and coordinators to assist. ☐

14. Develop an information management system such as a risk register to capture and report risk information. ☐

15. Develop and undertake risk assessment procedures at an operational, programme and strategic level in the organisation. ☐

16. Align risk management activities with other management tasks to ensure risk supports decision making rather than hinders it.

☐

17. Develop a routine of regular reporting of risks to the executive leadership and oversight committees.

☐

18. Provide ongoing awareness and training to all relevant employees about the risk policy, framework, strategy or plan.

☐

19. Provide ongoing awareness and training to all relevant employees about risk assessment procedures.

☐

20. Develop a risk performance management system that regularly checks the effectiveness of the risk governance approach.

☐

21. Regularly ensure the cost effectiveness of risk controls and introduce improvements where necessary.

☐

22. Develop effective cross functional working arrangements with internal and external stakeholders to openly talk about risks and opportunities.

☐

23. Start to build a risk aware, mindful and vigilant culture in all employees.

☐

24. Develop a system to learn from past events and near misses and use this knowledge to continuously improve the way things are done.

☐

BOX 8: RISK GOVERNANCE TRAINING & WEB RESOURCES

There are a number of organisations that offer guidelines and training on all aspects of risk. The following are suggested:

The Institute of Risk Management South Africa (IRMSA) offers various resources such as conferences, guidelines, a list of further reading, qualifications and training including an introductory course on risk management. Visit their website for more details about what they offer, and consider joining as an individual or corporate member. http://www.irmsa.org.za

National Treasury offer training on risk and corporate governance applicable to the public sector. The training is eLearning based meaning that anyone with an internet access can register. Visit their website for more details and consider doing some training. http://nt.treasury.gov.za/riskassessment/default2.aspx

The Water Research Commission publishes all its water research reports in its knowledge hub, many of which are related to the management of water utilities and risk in the water sector. Have a browse through the reports that are relevant to you. You will also find a link to the risk benchmarking tool which you can use to undertake a self assessment of your organisations risk governance maturity level.
http://www.wrc.org.za/Pages/KnowledgeHub.aspx

The South African Local Government Association (SALGA) have lots of useful guidelines relating to all aspects of municipality management and governance. http://www.salga.org.za

The US Environmental Protection Agencies portal offers guidance on risk management related to environmental systems including water resources and human health. http://www.epa.gov/risk

The UK Health and Safety Executive has a useful website with information about organisational culture and safety. http://www.hse.gov.uk/humanfactors/topics/culture.htm

The International Standards Organisation promotes best practice standards and has a number of documents relevant to risk governance, including ISO31000. http://www.iso.org/iso/home/standards/iso31000.htm

KEY RECOMMENDATIONS

The following are key recommendations from experienced risk managers, to those new to risk governance, who may want to improve the way risk is managed in their organisation (Adapted from Water Research Foundation, 2013; King, 2009; National Treasury, 2010; ISO31000, 2009).

Establish a focal point for risk governance

1.

The management of risk is a practitioner discipline. There are many types of risks a water utility needs to manage, for example risks to public health, the environment, health and safety, service delivery, project delivery, finances and reputation. Managing people, technical processes, systems and assets is a core requirement. It is recommended to develop an in house risk management function at an enterprise level to maximise competence and coordinate efforts. Risk champions or coordinators can be embedded into specific teams or departments to help facilitate practices at an operational level. Water utilities are likely to have pockets of good practice already established, often in water quality or asset management teams. Find these people and work with them as allies to help implement the wider risk governance programme.

Obtain Board or executive leadership support

2.

This is critical as they need to support the risk agenda for it to be successful as they are the ones who make strategic decisions and allocate resources. Anchor risk management support at the senior management level through a sponsor or senior level risk champion. Help your Board and senior managers to become familiar with risk policy, frameworks, processes and tools required to formalise risk practices.

Understand the organisational risk appetite and tolerance

3.

It is important to engage with leadership to understand and quantify the levels of risk that the water utility is prepared to accept in order to achieve its objectives. Without a defined risk appetite, decision makers must use their judgement to determine if a risk is tolerable or not. As such judgements are affected by individual, social, cultural and other factors, this approach does not provide a defensible basis for informed risk taking and is unlikely to be aligned to the organisational objectives or strategy. It is recommended to develop a risk appetite statement for all the various risk categories that may be applicable. Once the levels of risk appetite have been defined, these need to be communicated to all employees and hard coded into the risk register, risk criteria and the relevant decision making procedures.

See risk as the flipside of opportunity

4.

Risk management is more than just preventing a negative outcome, its taking advantage of an opportunity to get a positive outcome. Aim to create value in your organisation through the implementation of risk governance activities. It is important that risk governance activities are designed to support and compliment decision making rather than being just another activity. Too often managing risk is seen as a compliance requirement or audit function attached to finance, which causes it to be too narrow in its focus. Identify the value your organisation will gain from risk governance and communicate a clear outcome.

Communicate about risk

5.

Develop a common language, framework and process. Underpin this through a policy statement that is well communicated. Establish communication channels with key internal and external stakeholders to allow for the open and transparent flow of information to allow for decision making. Develop formal and informal feedback loops up and down the line so risks from throughout the organisation can be identified and management decisions made and implemented. Develop a forum in which employees at all levels of the organisation can discuss risks, both existing and emerging. Involve people who understand the organisation, its processes, systems and assets, including representatives from operations, finance and strategy. Consult widely both internally within your teams and departments and also outside the organisation, for example with the Department of Water and Sanitation, provincial government, neighbouring municipalities, the district municipality or an applicable catchment management agency or regional water utility. Establish regular external forums to facilitate this communication.

Promote good corporate governance

6.

It is important that risk governance is undertaken within the wider concept of good corporate governance. Develop a sound corporate governance structure and ensure this supports robust risk governance and management processes. King (2009) and the National Treasury (2010) specify the minimum requirements, for example establishing a formal risk or audit committee with a defined terms of reference.

Develop a portfolio approach

7.

Developing a portfolio approach to risk management requires all risks to be considered in the context of all other risks. A portfolio approach allows a water utility to manage its balance of risk and reward. Have a strategic risk register that considers a broad range of risk types, for example financial, reputational and environmental. Ensure operational risks and programme risks can roll up into the strategic register and that there is line of sight up to an organisational objective.

Develop a systems perspective

8.

Building a systems perspective is important as a risk is not normally a once off thing that can be managed in an ad hoc manner. Risks are often systemic and can extend beyond the immediate operating environment. Help the organisation to develop a systems view of their operations and identify system strengths and weaknesses, hazards and risks that may affect their objectives. A good understanding of the relationships between long term water resource planning, investment in the assets, operational reliability and customer satisfaction is critical. A water resource plan, water conservation and demand management plan, water safety plan or a wastewater risk abatement plan are all excellent frameworks to facilitate this system wide approach.

Be careful of silo thinking

9.

Be cautious of delegating all risk decision making to departmental managers and risk specialists, as this may result in silo thinking. For example where categories of risks are managed separately, by different business units, typically by assessing a single hazard or subsystem at a time. The interrelations between these risks and the organisations systemic risks will not be identified.

Ensure risk controls, responses and barriers are cost effective

10.

The implementation of a risk control, response or barrier will invariably cost money. It is important to select the right treatment for the risk in question and to ensure it is cost beneficial and is effective at reducing the risk. Periodic checks of control, response and barrier effectiveness is recommended. Usually risk reduction measures will have an inverse relationship between the reduction performance and the cost, providing a rapid reduction in risk within a cost effective range, but flattening out to a point of diminishing returns with increasing costs. The use of multiple barriers in sequence, where each barrier is used within its cost effective region, often proves to be more cost effective as a whole compared to having a single barrier in place that is in its region of diminishing return. It is recommended, where possible, to allocate a financial value to a risk, thereby allowing a consistent comparison between different risks and their controls. This will also allow for a more robust cost benefit analysis to be undertaken as the cost of risk can be accounted for. The allocation of a financial value usually happens when the consequence of an event is quantified financially.

Stay committed and dedicated

11.

Sound risk governance is a competence, and like with any skill it takes time and effort to master. The journey to excellence is a long one and can take many years. It will take time, effort and resources to develop a good risk governance competence in the organisation. Keep it fresh, don't do it once and put it away, it needs to be a living, dynamic and adaptable process. Good risk governance practices are achievable with commitment and dedication. It is important to stay committed and dedicated to the cause, even when there is leadership change or challenges. When risk governance is embedded into the organisational culture, and everyone is mindful of risk, it will become easier to carry out the activities required, it will be more sustainable and likely to last through long term change.

Be alert to home grown risks and latent flaws

12.

Often risks arise from within the organisation. Be aware of latent flaws within your organisation that may increase your vulnerability to negative events. Managers need to be alert and look out for corporate blindness by always questioning conventional wisdom or the status quo. Corporate blindness arises when organisations have "always done it that way", and they become complacent in their management approach. It's often behaviour or culture that causes corporate blindness, but it could also be a strategy that is not fit for the future, the lack of innovation or the reliance on decision making based only on historical experiences.

Become a learning organisation

13.

The challenge of good risk governance is to continuously strive for better by learning about your successes and failures, including what other water utilities are doing well. The best way is to evaluate what has happened in the past and use this information to learn and adapt for the future. Be careful not to assume that what worked in the past will certainly work in the future. Develop organisational systems and processes that capture learning from past events, openly share this information, celebrate success and grow and develop your employee's skills and capabilities.

Develop resilience

14.

Develop resilience in your people, assets, systems and processes. Resilience is the ability to quickly recover from a disrupting event. For a water utility it is particularly important to develop the ability to anticipate, adapt to, or recover from such events.

Something to think about

Is your water utility always dealing with the same issues and challenges? Do you feel that no matter what you do the problems don't go away? Perhaps you are suffering the effects of corporate blindness, whereby your organisation is unsuccessfully applying old solutions to new problems.

YOUR NOTES

Chapter 7

Glossary & Further Reading

GLOSSARY

A number of terms have been used throughout this guide and these are described below.

Barrier – a measure put in place to prevent a failure. These can be physical such as a sand filter or a sewer pipeline, or they can be softer for example training programmes, water quality monitoring, operator behaviour and vigilance.

Benchmarking – The process of measuring, comparing and tracking organisational performance relative to a best practice standard or a comparison with best in class organisations.

Communicate & consult – The two way and iterative process of gathering and sharing information between stakeholders relevant to the management of risks.

Consequence – The impact of an event, activity or hazard on objectives. There are often a range of potential consequences from one event, activity or hazard, and these can be both positive and negative.

Control – A measure that is established to modify a risk. Also called a risk response.

Corporate blindness – When organisations continue to do things in the same way as before without realising that better ways of working are possible. This can cause organisations to be blind to new risks or result in old solutions being applied unsuccessfully to new problems.

Cost benefit analysis – A methodology used to identify and quantify the total costs and benefits of an activity to inform decision making. Outputs that are cost effective will typically be favourable for implementation.

Culture – The collective mind set, behaviours, values and beliefs that shape and influence actions, interactions and decisions.

Deterioration model – A methodology that uses statistical analysis to predict when an asset might fail.

Establishing the context – Identifying and defining the internal and external factors and parameters that could influence the way the organisation manages risk. This will also include defining the risk criteria.

Failure mode effect analysis – Methodology to systematically identify the components of a system, how they may fail, the likelihood and consequence of failure.

Gateway process – Decision making process to identify and assess the risks and benefits of a project at key points in the project lifecycle.

Hazard – A source of potential harm.

Inherent risk – Risk that exists before any risk response is in place.

Interdependencies – Where risks are connected in some way or have an effect on each other.

Likelihood – The probability or chance that the consequence or impact could occur.

Opportunity cost – The cost of an alternative that must be forgone in order to pursue a certain action. Put another way, the benefits you could have received by taking an alternative action.

Proactive risk management – When organisations actively manage risks by continuously anticipating future issues, preparing risk scenarios and plan to manage these. These organisations are less vulnerable to change and are more resilient to shocks and stresses.

Reactive risk management – When organisations deal with issues when they arise and place less focus on preventing future risks. These organisations are vulnerable to change and are less resilient.

Reporting cycle – The continuous process of capturing, reviewing, reporting and managing risks according to a defined schedule and programme. Each organisation will typically choose a cycle that meets their needs and may be weekly, monthly, quarterly, half yearly or annually. Different cycles may exist for different levels of the business.

Residual risk – The level of risk remaining after a risk control or treatment has been implemented. Zero residual risk is not possible. The aim should be to reduce residual risk to within the risk tolerance threshold.

Risk – The effect of uncertainty on objectives. The effect can be positive or negative.

Risk analysis – The process of using quantitative or qualitative methods and tools to define the nature and level of a risk by assessing consequence and likelihood.

Risk appetite – The upper and lower limits of acceptable risk exposure for a particular objective that the organisation is prepared to take. Risk appetite needs to be quantified, recorded and communicated.

Risk assessment – The combination of risk identification, analysis and evaluation, whereby the level of risk posed to an objective is determined.

Risk attitude – The overall approach to pursue, retain or manage risks in pursuit of objectives.

Risk champion – An individual who is tasked with promoting risk management and governance within the organisation, usually within their team or department.

Risk coordinator – An individual who is tasked with specific risk management responsibilities within their team or department.

Risk criteria – Terms of reference against which the significance, likelihood and consequence of a risk is assessed. The criteria is based on organisational objectives, risk appetite and the organisational context.

Risk evaluation – The process of comparing and prioritising risks and determining how these risks will be managed.

Risk governance – The coordinated activities of an organisation to control risks, encompassing the risk management activities as well as the wider cultural, leadership, communication and corporate governance activities.

Risk identification – The process of identifying potential hazards, events and activities that may result in a risk. Risk identification can involve historical observations, expert judgement, modelling, forecasting and stakeholder engagement.

Risk management audit – A systematic and independent process for evaluating the risk management system to ensure it is effective and fit for purpose.

Risk management framework – Set of components that provides the foundation and arrangements for designing, implementing, monitoring, reviewing and improving risk management activities in the organisation.

Risk management plan – A specific plan aligned to the risk management framework that specifies the actions to be undertaken and the resources required to implement the framework for a particular part of the organisation, for example a water safety plan, asset management plan or a project delivery plan.

Risk management policy – A high level statement of intent outlining the support, mandate, commitment and direction of the Board or executive leadership to risk governance in the organisation.

Risk manager – A key position in a water utility responsible for managing and coordinating the risk governance functions. This position needs to be at an enterprise level thereby providing a link between operational and programme risk management and the more strategic business activities of the Board or executive leadership. Sometimes the role can be called a chief risk officer.

Risk matrix – A graphical grid display of likelihood and consequences scales used to show thresholds of low, medium and high risks. A risk matrix can be used to promote a discussion about the risks but must not be solely relied on to prioritise risks.

Risk register – A record of organisational risks that satisfy the defined reporting criteria. The risk register is a living document that must be regularly reviewed and used to direct managerial effort.

Risk reporting – Form of communication to stakeholders about the status of risks and their management. Reporting usually happens according to a reporting cycle. A well designed risk register can make risk reporting easier.

Risk response – A measure that is established to modify a risk. Also called a control.

Risk tolerance – The amount of risk the organisation is willing to bear after a risk treatment is in place. The residual risk remaining after a treatment is in place needs to be within the risk tolerance threshold.

Risk treatment – The process of designing and implementing a risk response, control or barrier using the outputs from the risk evaluation activity.

Stakeholder – An organisation or person, including customers and the public, who have an interest in what the organisation does or are affected by decisions the organisation makes.

Strategic risks – High level risks that could impact strategic organisational objectives. These often include business critical risks to reputation, financial viability, legislative compliance or strategic direction.

SWOT analysis – A methodology to identify the strengths, weaknesses, opportunities and threats to a project or business objectives.

Vulnerability – The property of something to be susceptible to harm or a source of a risk.

Wastewater risk abatement plan – a structured methodology to identify hazards and risks in a waste water system adopting a source to source approach.

Water safety plan – a structured methodology to identify hazards and risks in a water system adopting a source to tap approach.

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