



Risk Management Process



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Risk Management Process

What is Risk?

Risk Analysis VS Risk Management

Risk Management Process:

- Reporting Cycle
- Breakdown
- Identify – Context
- Identify – Risks
- Assess – Estimate
- Assess – Evaluate
- Plan
- Implementation & Monitoring
- Embed and Review
- Expected Uncertainty
- QSRA & QCRA
- Optimism Bias

Risk Management: Benefits and Costs

Q&A



What is Risk?

A simple way to understand the nature of risk is the basic definition: “Risk is uncertainty that matters” from Hillson, 2003. While this is not a formal definition of risk, it is sufficiently robust to provide important insights that can shape our understanding of what risk really means.

The view of risk as “uncertainty that matters” has been adopted by many standards bodies as a starting point for developing a more detailed risk definition.

A Risk can be formally described as an uncertain event or series of events (Hillson’s “uncertainty”) which, should it occur, would impact upon the achievement of one or more of the project’s objectives (Hillson’s “that matters”).

When most people talk about risk in projects, they are thinking only about uncertain future events that would have a negative effect on achievement of project time, cost and performance objectives. However, risk can be perceived either negatively (threats) or positively (opportunities).

Risks or Issues

Risks: Risk can be perceived either positively (opportunities) or negatively (threats). A risk is the potential of situation or event to impact on the achievement of specific objectives.

Issue: A problem that is now, or is about to breach delegated tolerances for work on a project or programme. Issues require support from the sponsor to agree a resolution.

Risk Analysis VS Risk Management

Risk Analysis VS Risk Management

Risk Analysis is the process of assessing risks, whereas **Risk Management** uses risk analysis to devise management strategies to reduce or enhance risk. In project management, these techniques are used to address the questions “how long will this project eventually take?” (schedule risk), “how much will it finally cost?” (cost risk), and “will its product perform according to specifications?” (performance risk).

What is Risk Management all about and why is it important?

Risk Management processes allow for proactively planning to capture opportunities and limit threats. It is the identification, evaluation, and prioritization of risks followed by coordinated and economical application of resources to minimize, monitor, and control the probability or impact of uncertain events or to maximize the realization of opportunities.

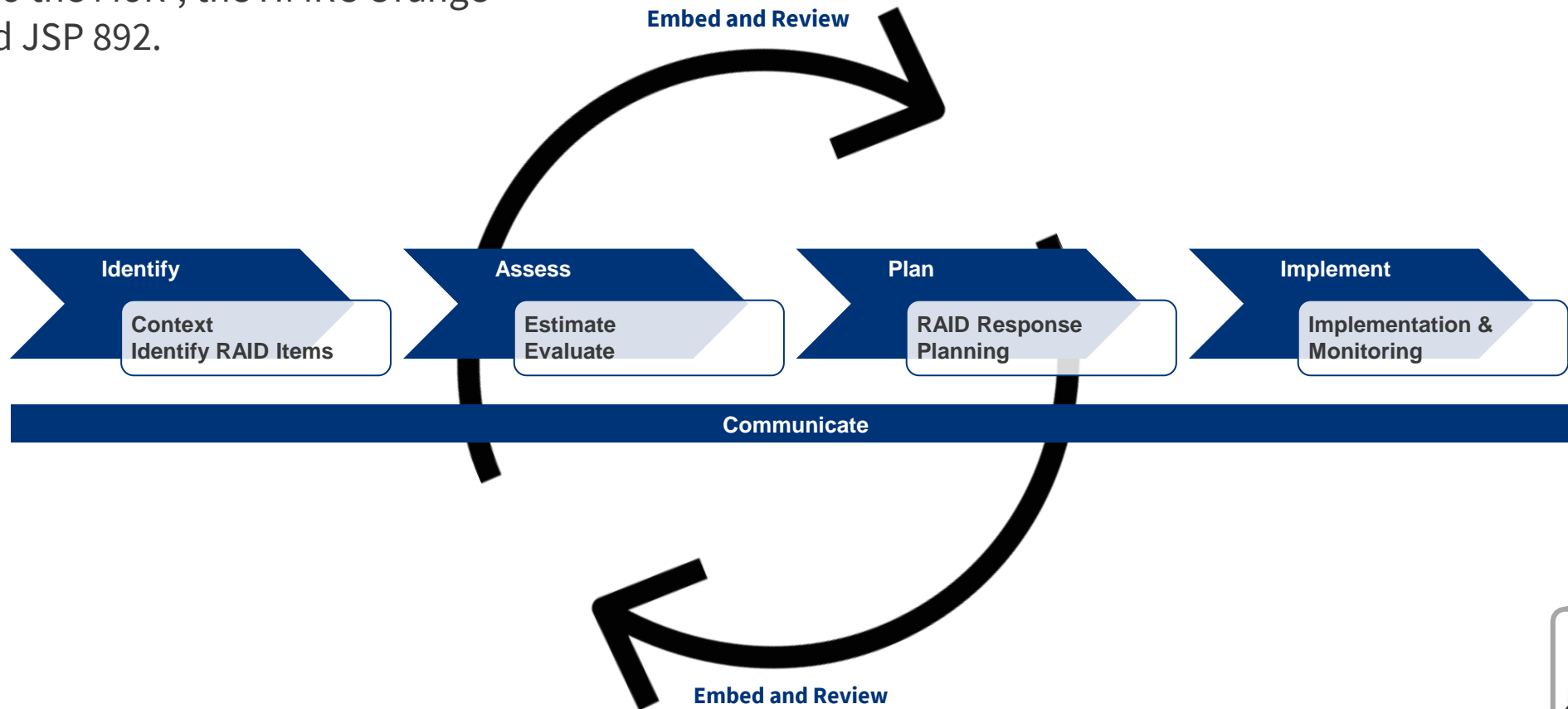
Objectives of Risk Management

To ensure that all knowable risks are understood / That measured responses are in place / To make provision for responding to risk proactively or in minimising impact.



Risk Management Process

Our **Risk Management Process** is aligned to the MoR[®], the HMRC Orange Book and JSP 892.



Risk Management Process: Reporting Cycle

Reporting Cycle

Identify – Context and Risks: Workshop

Assess – Estimate: Workshop

Assess – Evaluate: SME meeting (ad-hoc)

Plan: Workshop/Monthly Progress Meeting

Implementation & Monitoring: Progress Meeting

Monthly Progress Meeting

1— Is my risk register up to date (identify risks)

1.1— Risk Status (Open, Closed as Expired, Closed as Issue or Escalated)

1.2— Management Level (linked to the above if “Escalated” is selected or unselected)

1.3— Risk Response

2— Are my responses effective (plan)

3—Implement responses

4—Monitor effectiveness until next meeting (mitigation owners to inform if a risk triggers)

Monitor → Identify Risks → Plan Response → Implement



Risk Management Process: Breakdown

The goal of “**identify – context**” is to obtain information about the planned activity and how it fits into the wider organization and market/society.

The goal of “**identify – risks**” is to identify risks to the activity objectives with the aim of minimizing threats whilst maximizing opportunities.

The goal of “**assess – estimate**” is to prioritize individual risks so that it is clear which risks are most important and most urgent.

The goal of “**assess – evaluate**” is to understand the risk exposure faced by the activity by looking at the net effect of the identified threats and opportunities on an activity when aggregated together.

The goal of “**plan**” is to prepare specific management responses to the threats and opportunities identified ideally to remove or reduce the threats and to maximize the opportunities. Attention to this step ensures as far as possible that the business and its staff are not taken by surprise if a risk materializes.

The goal of “**implement**” is to ensure that the planned risk management actions are implemented And monitored as to their effectiveness, and corrective action is taken where responses do not match expectations.



Risk Management Process: Identify – Context

The goal of “identify – context” is to obtain information about the planned activity and how it fits into the wider organization and market/society.

Establishing the context is about ‘setting the scene’ to provide focus, insight and ideas in support of risk identification, and should be performed as a precursor to identifying risks..

This will include understanding:

- What the activity objectives are
- What the scope of the activity is
- What assumptions have been made
- What constraints are relevant to the activity
- How complete the information is
- Who the stakeholders are and what their objectives are
- Where the activity fits in relation to the organizational structure
- The organization’s own environment (industry, markets, products and services etc.)
- The organization’s approach to risk management.



Risk Management Process: Identify – Risks

The goal of “identify – risks” is to identify risks to the activity objectives with the aim of minimizing threats whilst maximizing opportunities.

The risk identification stage provides a structured approach to understand how the objectives identified in establishing the context may be affected by risk. This is done by generating and recording a comprehensive list of risks.

This will include:

- Identifying the threats and opportunities to the activity
- Preparing a risk register
- Preparing key performance indicators and early warning indicators
- Understanding the stakeholders’ view of the risks.



Risk Management Process: Identify – Risks

Risks should be captured in a risk register (a repository for capturing risk information).

Typical content of a Risk Register:

- Risk number (unique within register);
- Risk type (threat or opportunity);
- Risk Category
- Author (who raised it);
- Date identified;
- Date last updated;
- Risk Description (**Cause** – Because of / **Risk**– There is a risk that / **Effect** – That can lead to);
- Likelihood of risk arising;
- Interdependencies with other sources of risk;
- Expected impact;
- Bearer of risk;
- Countermeasures; and
- Risk status and risk action status.



Risk Management Process: Identify – Risks

How to Describe and Capture Risks

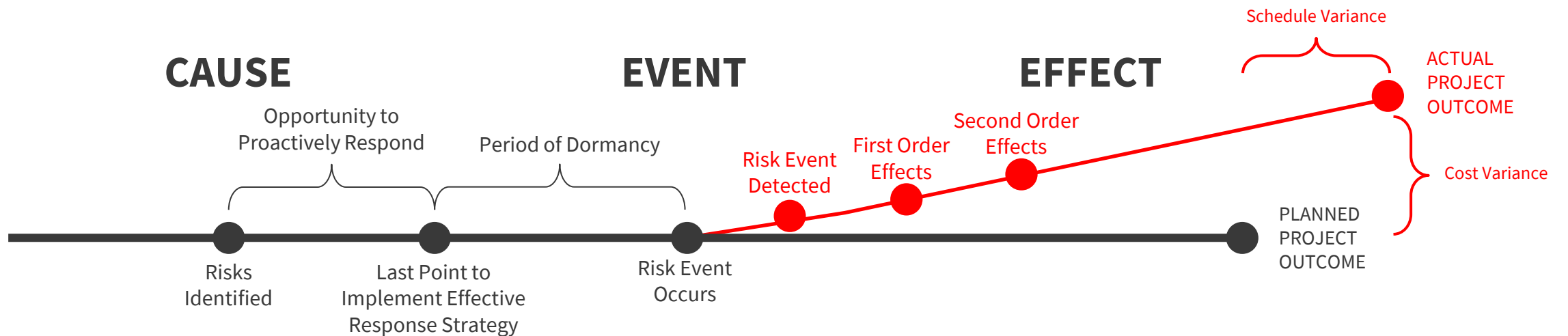
A risk is: a combination of a **Cause**, a **Risk** and an **Effect**. The description of a risk must enable understanding of these three components.

Risk Components	Components Details	Start the Description with
Cause	<ul style="list-style-type: none">- Causes are the sources of the risk event – the reason why the risk could happen. These can include conditions, circumstances, drivers, and activities that may result in the risk event occurring.- Causes can be internal or external to MOD.	Because of -
Risk	<ul style="list-style-type: none">- Incidents or occurrences that arise from a cause that could have an effect on the achievement of objectives, or cause harm or loss.- Consider events that can happen that may impact people, processes, systems, assets and the external environment in your analysis.	There is a risk that -
Effect	<ul style="list-style-type: none">- Effects arising from the risk event, if it occurs, that could affect the achievement of objectives.- Measured through estimating the impacts on assets and objectives, e.g. finances, reputation, ability to deliver outputs/capability.	That can lead to -



Risk Management Process: Identify – Risks

Cause, Risk and Effect visual representation



Risk Management Process: Identify – Risks

Approaches to Identifying Risks

Risks can be identified through a number of approaches:

- ‘Top-Down’ / ‘Bottom-Up’
- Brainstorming
- Stakeholder interviews
- Nominal Group Technique
- Affinity diagram
- Requirements review
- Project plans
- Root cause analysis
- SWOT analysis

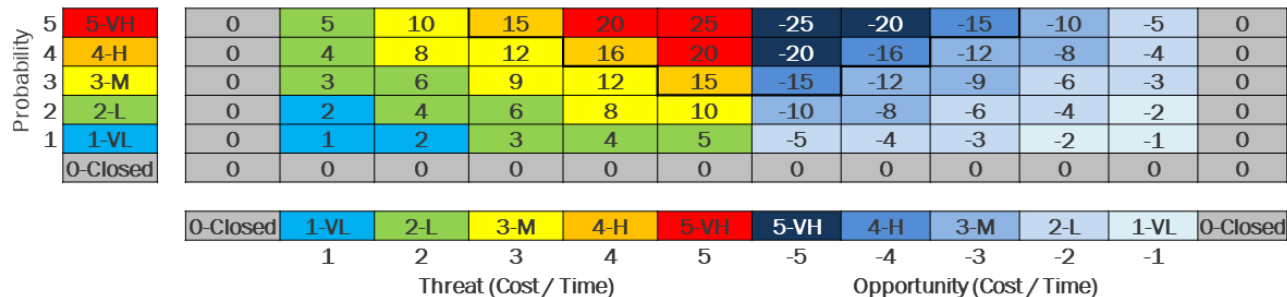


Risk Management Process: Assess – Estimate

The goal of “assess – estimate” is to prioritize individual risks so that it is clear which risks are most important and most urgent. This will require an understanding of:

- The probability of each threat and opportunity – how likely is it to occur?
- The impact of each threat and opportunity – what would be the effect on activity objectives if it occurred?
- The proximity of each threat and opportunity – when would the risk occur if it did?

The risks should be qualitatively assessed to determine the probability of each risk occurring and the possible impact on any of the project objectives (e.g. time, cost, quality, safety) should it occur. It is useful for the organisation to define appropriate quantitative thresholds for the classification of each risk (e.g. very low – very high). Each risk can then be plotted on a probability-impact grid.



Proximity	
Range	RAYGB Status
In the Past	Blue
Active Risk	Black
<3 months	Red
3 to 6 months	Yellow
6 to 12 months	Green
> 12 months	Light Green



Risk Management Process: Assess – Estimate

Difference Between Qualitative and Quantitative Risk Analysis

Qualitative and **Quantitative risk analysis** are methods to assess the same criteria at different capacities. Fundamentally the difference lies between subjective and objective understandings.

Qualitative risk analysis is the process of rating or scoring risk based on a person's perception of the severity and likelihood of its consequences. The goal of qualitative risk analysis is to come up with a short list of risks which need to be prioritized above others. Used when there is a change in perception of a risk and/or a new risk has been identified.

Quantitative Risk Analysis refers to the numeric analysis of the overall effect of the total quantifiable risks involved in the project objectives. Used when a large amount of data on the risk and its impact and/or Qualitative risk analysis needs to be validated.

Difference Between Qualitative and Quantitative Risk Analysis

The key difference between qualitative and quantitative risk analysis is the basis for evaluating risks. Qualitative risk analysis is based on a person's perception or judgment while quantitative risk analysis is based on verified and specific data.



Risk Management Process: Assess – Estimate

How to Assess Inherent, Current and Target Risk

Understanding the true nature and potential size of a risk exposure requires its Inherent, Residual and Target risk positions to be assessed, considering the effects of controls and mitigations.

Controls are activities and measures that reduce the likelihood of a risk occurring. Mitigations are activities and measures that reduce the impact of a risk, should it occur.

How to Assess a Risk

Once a risk has been identified and appropriately described (**cause**, **risk** and **effect**), the following steps should be carried out, to assess the severity of the risk:

- Step 1 – Establish the controls and mitigations currently in place
- Step 2 – Assess the inherent position
- Step 3 – Assess the current position
- Step 4 – Assess the target risk position

Inherent basis involves the assessment of the pre-mitigated impact and likelihood of the risk.

Current basis involves the assessment of the current impact and likelihood of the risk based on how it is currently being managed.

Target basis involves the determination of the desired impact and likelihood levels for the risk, based on the amount of exposure the Department is comfortable in accepting for the benefits it derives from taking the risk, and the feasibility and cost of further response activities



Risk Management Process: Assess – Evaluate

The goal of “assess – evaluate” is to understand the risk exposure faced by the activity by looking at the net effect of the identified threats and opportunities on an activity when aggregated together.

Quantitative Schedule Risk Analysis and Quantitative Cost Risk Analysis

Quantitative risk analysis allows the analyst to estimate the finish date and cost of the project with a probability distribution that is created by applying Monte Carlo simulation to a project plan such as the schedule, cost estimate, or cost-loaded schedule that may be affected by uncertainty and risks.

What is Monte Carlo simulation in risk?

Monte Carlo Simulation performs risk analysis by building models of possible results by substituting a range of values—a probability distribution—for any factor that has uncertainty. It then calculates results over and over, each time using a different set of random values from the probability functions.



By sampling different possible inputs, Monte Carlo Simulation calculates thousands of possible future outcomes, and the chances they will occur. This helps you avoid likely hazards—and uncover hidden opportunities.



Risk Management Process: Plan

The goal of “plan” is to prepare specific management responses to the threats and opportunities identified ideally to remove or reduce the threats and to maximize the opportunities. Attention to this step ensures as far as possible that the business and its staff are not taken by surprise if a risk materializes.

Once the target risk position has been established, it should be compared against the residual risk position in order to understand if a risk response is required. There are three possible outcomes:

- I. The current risk score is greater than the target risk score
Reduce the level of risk exposure to an acceptable level by developing and implementing a Risk Response Plan that will reduce the risk exposure to the target position.
- II. The current risk score is smaller than the target risk score (e.g. the risk is over controlled)
Consider increasing the level of risk exposure by relaxing or removing controls and mitigations until risk exposure is aligned with target position. This can realise cost savings on existing responses, but should always be thoroughly evaluated and signed-off by appropriate management before enacting.
- III. The current risk score is the same as the target risk score
No further action required: Maintain and monitor existing controls and mitigations as residual risk is aligned to target risk. No response plan required.



Risk Management Process: Plan

A risk response needs to be considered for all risks where the current risk position is greater than the target risk position and the Risk Owner and/or respective management decides whether and what risk response is required to manage the risk. The Risk Owner should evaluate risk responses based on a consideration of their effectiveness, cost and feasibility.

Risk Response	Applicable to
Avoid	Threat
Exploit	Opportunity
Reduce	Threat
Enhance	Opportunity
Transfer	Threat
Share	Threat
Accept	Threat/Opportunity
Prepare Contingent Plans	Threat

A risk response plan should be prepared once the risk response options have been assessed, prioritised and the appropriate risk response(s) determined.

The plan should be reviewed by the Risk Owner (if not the preparer) and it may be necessary to appoint an Action Owner(s), as some of the actions to respond to the risk may not be within the remit of the Risk Owner.



Risk Management Process: Implementation & Monitoring

Implementation

The goal of “implement” is to ensure that the planned risk management actions are implemented and monitored as to their effectiveness, and corrective action is taken where responses do not match expectations.

Monitoring

Monitoring and review processes to track the status of individual risks, aggregated risks and the effectiveness of their risk management process. Risk monitoring provides management with the necessary risk information to:

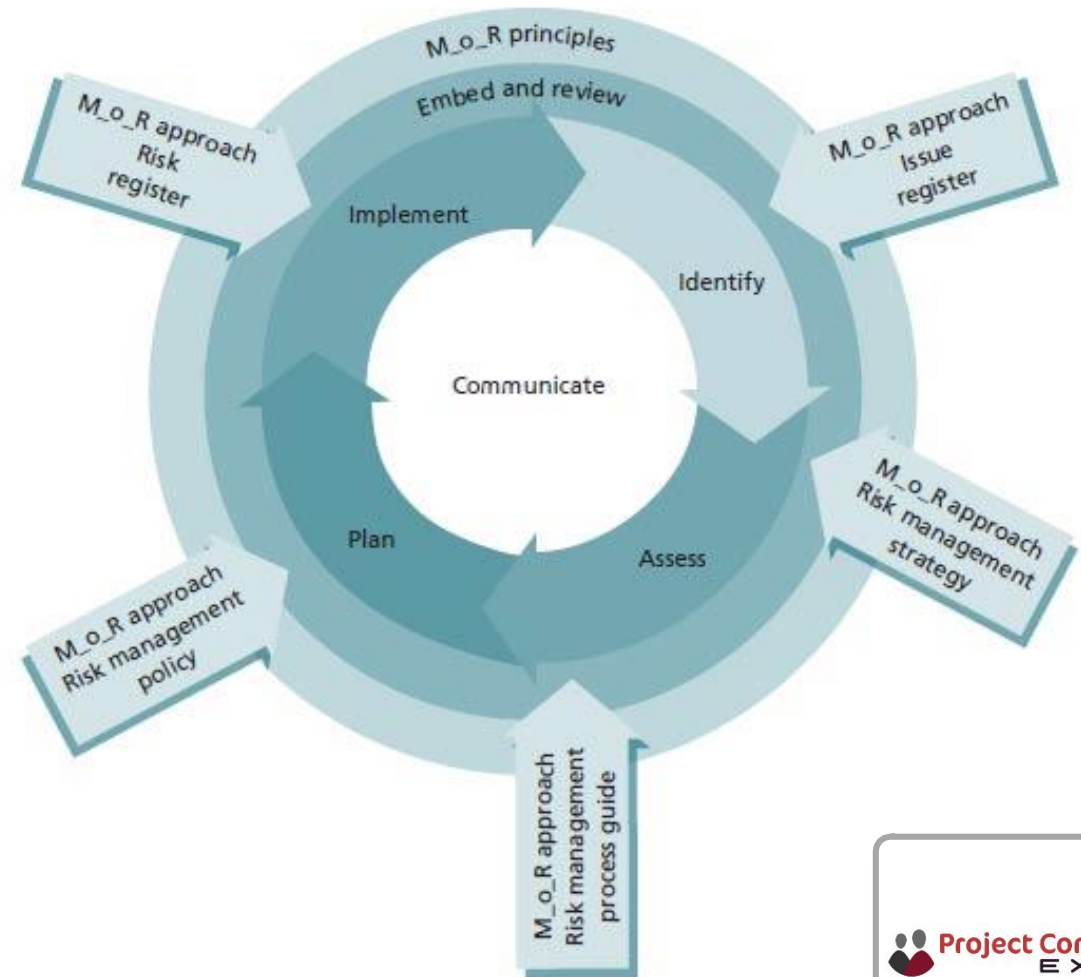
- detect changes in risk profile and status of risks, supporting decisions on prioritisation, escalation up the management line, and response activities
- allow challenge and oversight on the completeness and quality of the risk information produced and the robustness of the risk management approach
- ensure that risk responses are effective and efficient in both design and operation
- monitor the progress of risk response plans
- obtain further information to improve the identification and analysis of risks and
- analyse and learn lessons from risk issues / incidences, changes, trends, management successes and failures.



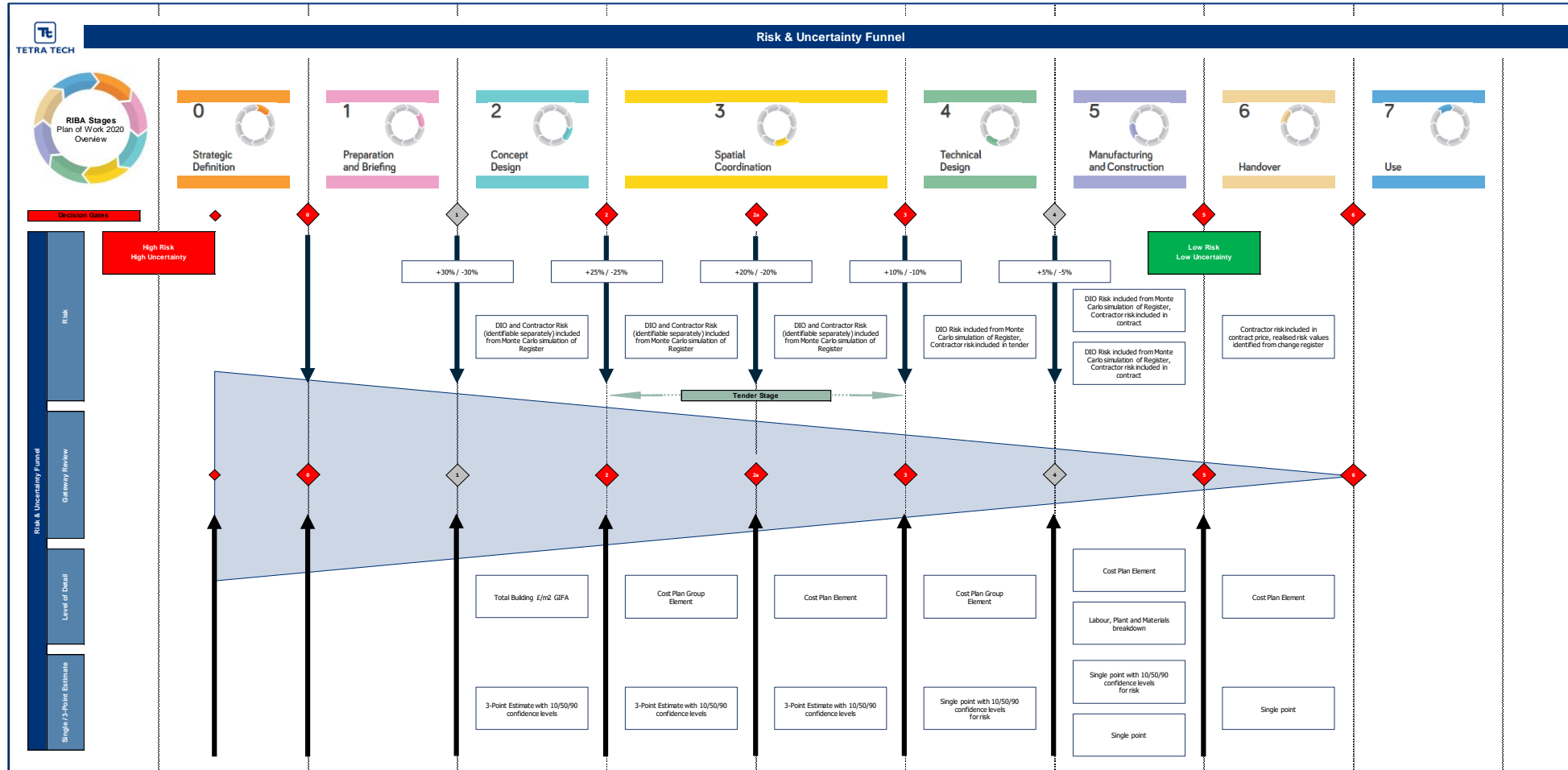
Risk Management Process: Embed and Review

Embedding **Risk Management** into a project must start with the Management of Risk Principles (Align with Objectives, Fits the Context, Engages the Stakeholders, Provides Clear Guidance, Informs Decision Making, Facilitates Continual Improvement, Creates a Supportive Culture and Achieves Measurable Value), and an appreciation of what the project would look and feel like should the principles be embedded into MOD culture.

It is important therefore to embed risk management into MOD culture and to put in place mechanisms to review and confirm that the approach to **Risk Management** remains appropriate given the project's objectives and context.

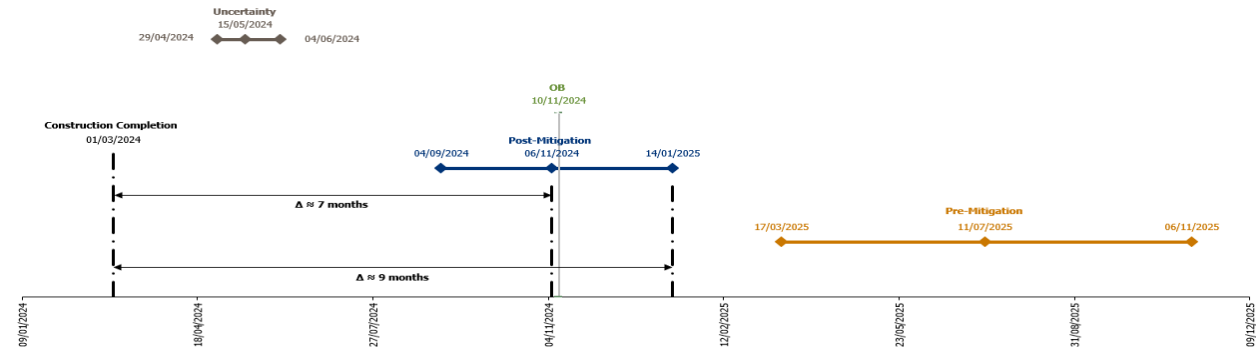
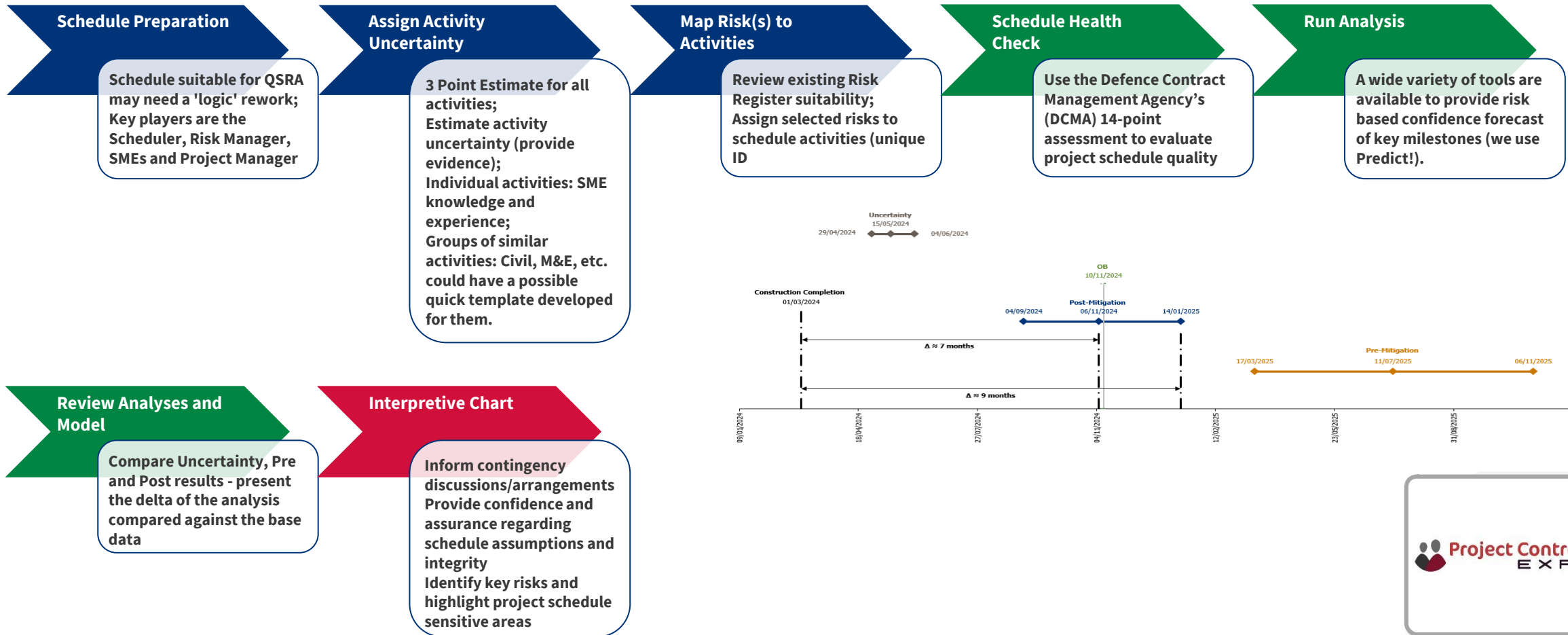


Risk Management Process: Uncertainty



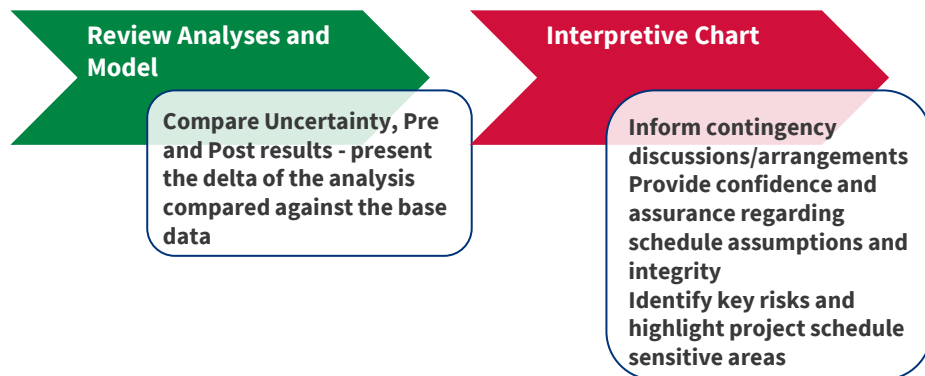
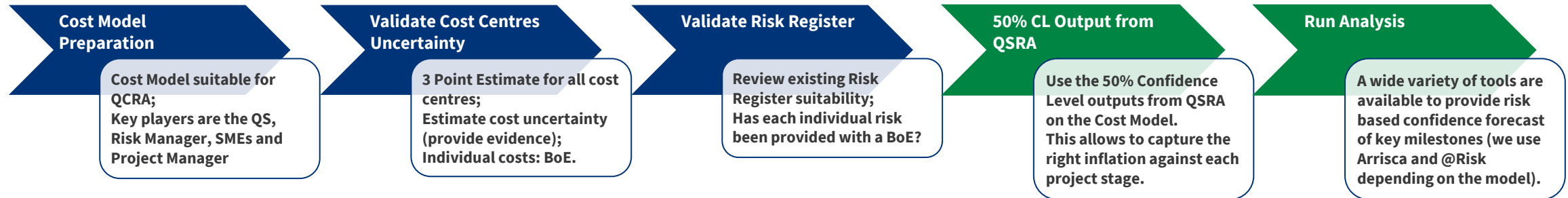
Risk Management Process: QSRA & QCRA

QSRA – Quantitative Schedule Risk Analysis



Risk Management Process: QSRA & QCRA

QCRA – Quantitative Cost Risk Analysis



Quantitative Cost Risk Analysis Table

Options	Risk Confidence Level		
	10%	50%	90%
Option Name	€400,971	€3,999,064	€9,052,186
	1.99%	19.86%	44.95%

JSP 507 Part 2, page 100

Options	CAPEX Excluding Risks ML	OB		CAPEX Including Risks			CAPEX Excluding Risks ML + OB	Results	
	€	%	€	10%	50%	90%	€	Pass/Fail	Reasoning
Option Name	€20,138,428	23.79%	€4,790,680	€16,243,731	€20,012,645	€25,266,097	€24,929,108	Pass	Between 50% and 90% CL



Risk Management Process: Optimism Bias

As part of a Project Team, we fail to deliver all the evidences requested under the JSP 507 for MoD projects and under the Green Book for wider Public Sector Contracts.

The Government Publications states that an Optimism Bias assessment will be used as a ‘sanity check’ of the risk assessment.

OB describes the tendency to underestimate the cost and duration of a Project, it also describes the tendency to overestimate the benefits of a project.

Studies have shown that OB is caused by a failure to identify and effectively manage Project Risk resulting in cost and schedule overrun.

Tetra Tech runs an Optimism Bias workshop, having an experienced facilitator guiding the Project Team (TSP & DIO).

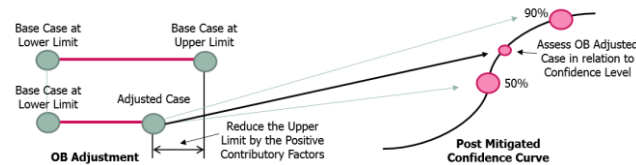


Risk Management Process: Optimism Bias

The OB figures from the workshop are compared against the QCRA and QSRA outputs.

1.1 – Passing Result (Between 50% and 90% CL)

If the resultant OB figure is situated between the 50% and the 90% confidence figure and the assessment has been carried out correctly, with the correct stakeholder involvement, then the result suggests that base cost/schedule uncertainty and potential risks on the Project seem to have the adequate Risk provision at this moment in time.



1.2 – Fail Result

1.2.1 – Above 90% CL

If the resultant OB figure is situated on top of the 90% confidence figure or above it and the assessment has been carried out correctly, with the correct stakeholder involvement, then the result suggests that base cost/schedule uncertainty and potential risks on the Project may have been understated.

1.2.2 – Below 50% CL

If the resultant OB figure is situated on top of the 50% confidence figure or below it and the assessment has been carried out correctly, with the correct stakeholder involvement, then the result suggests that base cost/schedule uncertainty and potential risks on the Project may have been overstated.



Risk Management: Benefits and Costs

Risk Management: Benefits and Costs

A number of 'hard' and 'soft' benefits are likely to be derived from the successful management of risk on projects. Hard benefits are likely to be more tangible and easier to quantify. Soft benefits may revolve around the people side of risk management and the development of a more mature risk management approach.

Benefits

Main Benefits:

- Discourages acceptance of financially unsound projects.
- More credible plans, schedules and budgets.
- Leads to the use of the most suitable type of contract.
- Identifies and allocates responsibility to the best risk owner.
- Demonstrates a professional and responsible approach to stakeholders.

Key to Success

Engaging stakeholders in risk identification and analysis.

Identifying and implementing appropriate responses to identified risks or issues.

Making appropriate provision for responding to risks and issues.

Keeping the conversation on risk live.

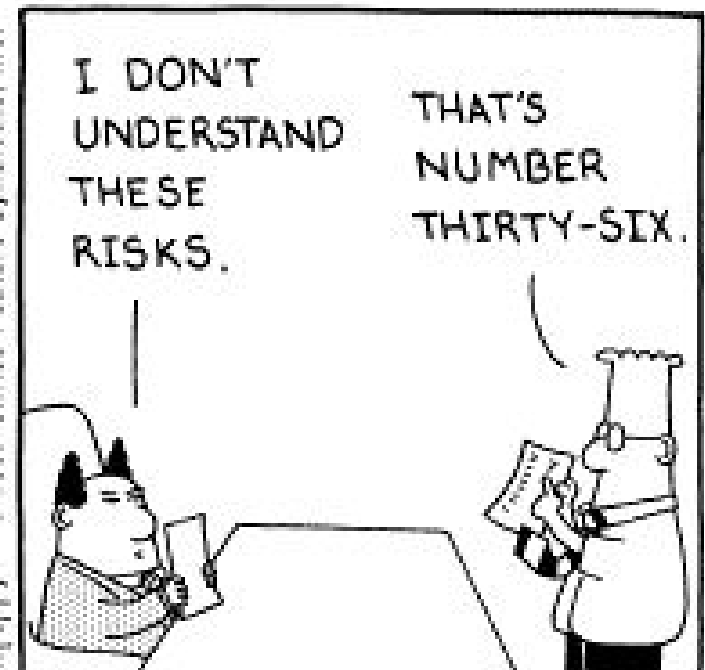
There is little benefit in undertaking the initial steps in the risk management process unless we ensure that the agreed responses are undertaken and achieve the desired effect.



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Thank you

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