

# RISKworld

issue 7 spring 2005

the newsletter of risktec solutions limited

## In This Issue

Welcome to Issue 7 of RISKworld. If you would like additional copies, do please contact us, and feel free to pass on RISKworld to other people in your organisation. We would also be pleased to hear any suggestions on what you would like to see in future issues.

Contact Steve Lewis

## Contents

### "Nae Danger"

Risktec opens a new office in Glasgow. Alan Hoy provides an update.

### Risk-Based Decisions

Greg Davidson outlines the risk-based decision-making process and its application.

### Active Risk Management

Robin Currie outlines the importance of actions rather than words for successful risk management.

### What QRA?

Steve Lewis investigates QRA software for onshore and offshore oil & gas facilities.

### Using Consultants

Can't live with them, can't live without them. Gareth Ellor describes how to get the best out of consultants.



**Risktec**

## Nae Danger! Risktec Ventures North



Risktec's new Glasgow Office at the Hillington Park Innovation Centre

Over the past 12 months, Risktec Solutions Limited has been gradually increasing its profile in central Scotland and is becoming firmly established as one of the region's most respected safety, engineering and risk management consultancies. Now, it has left its formative home in central Glasgow and moved into new accommodation at the Hillington Park Innovation Centre in Hillington, Glasgow. The office currently comprises four permanent members of staff but future expansion is on the cards as new business opportunities emerge from a growing client base across a wide range of business sectors.

Alan Hoy, Risktec's Managing Director, explains the strategy: "As a collective group, our Glasgow-based consultants have over seventy years' experience within the UK nuclear power industry covering mechanical, electrical, control and protection systems, with particular emphasis on safety, risk and project management. The new Glasgow team has strengthened our existing systems engineering and safety assurance capabilities, allowing us to better serve our existing client base.

We are delighted to welcome David Howie, Jim Thomson, Gareth Ellor and

Steven Roach into the Risktec organisation.

Jim Thomson, who previously worked as Protection and Electrical Systems Branch Manager at British Energy, comments: "From our new Glasgow office and with support from the wider Risktec organisation, we're in a strong position to serve the sizeable nuclear power industry in Scotland. In addition we'll be able to support Risktec's Warrington and Aberdeen offices to provide more responsive, local support to new and existing clients in Scotland."

Gareth Ellor, who joined Risktec in January 2004 and

was instrumental in establishing the new Glasgow venture sums up the achievement: "It's great to see the groundwork we've put in over the last year evolve into a permanent office. Whilst this is an exciting milestone, we remain totally focused on developing sustainable and long-term relationships with our clients to deliver real added-value."



Jim Thomson

# Risk Based Decision Making

Decisions evolve around the need to make choices, either to do or not to do something, or to select one option from a range of options. The choices available are often constrained by social, technical, business, safety and environmental requirements and objectives. Successful decision making requires an understanding of these many requirements and objectives, their relative importance, and how to assess options and make the 'best' decision.

A typical framework for the decision making process is illustrated in Fig. 1. The importance of the change dictates the extent and formality of assessment, documentation, review, consultation and approval.

## Risk based decision making process

The overall decision making process steps remain the same in Risk Based Decision Making - define the issues, examine the options and implement the decision. What is different is that the decision is arrived at by a structured understanding of the risk-reward balance and uncertainties, illustrated by Fig 2.

The options available will be based on one or more of the "4Ts" risk response strategies: Terminate, Treat, Tolerate, Transfer. A well designed risk response portfolio will focus not only on reducing the likelihood of a risk occurring, but also includes plans for stabilisation and recovery to ensure business continuity and effective reputation management. It may also be possible to reduce the potential for financial loss by hedging techniques or insurance purchase.

Next, an evaluation of the risk response options is required, taking into account their cost, benefits and views of relevant stakeholders. Whilst risk responses which are not cost-effective (i.e. the value of any reduction in risk is outweighed by the cost of the control) would normally be discarded, there may be mandatory requirements imposed by internal standards or external regulatory authorities.

Ultimately, a decision is made. Often the decision is clear-cut: the proposal is clearly worthwhile or not. At other times there is no clear answer, requiring

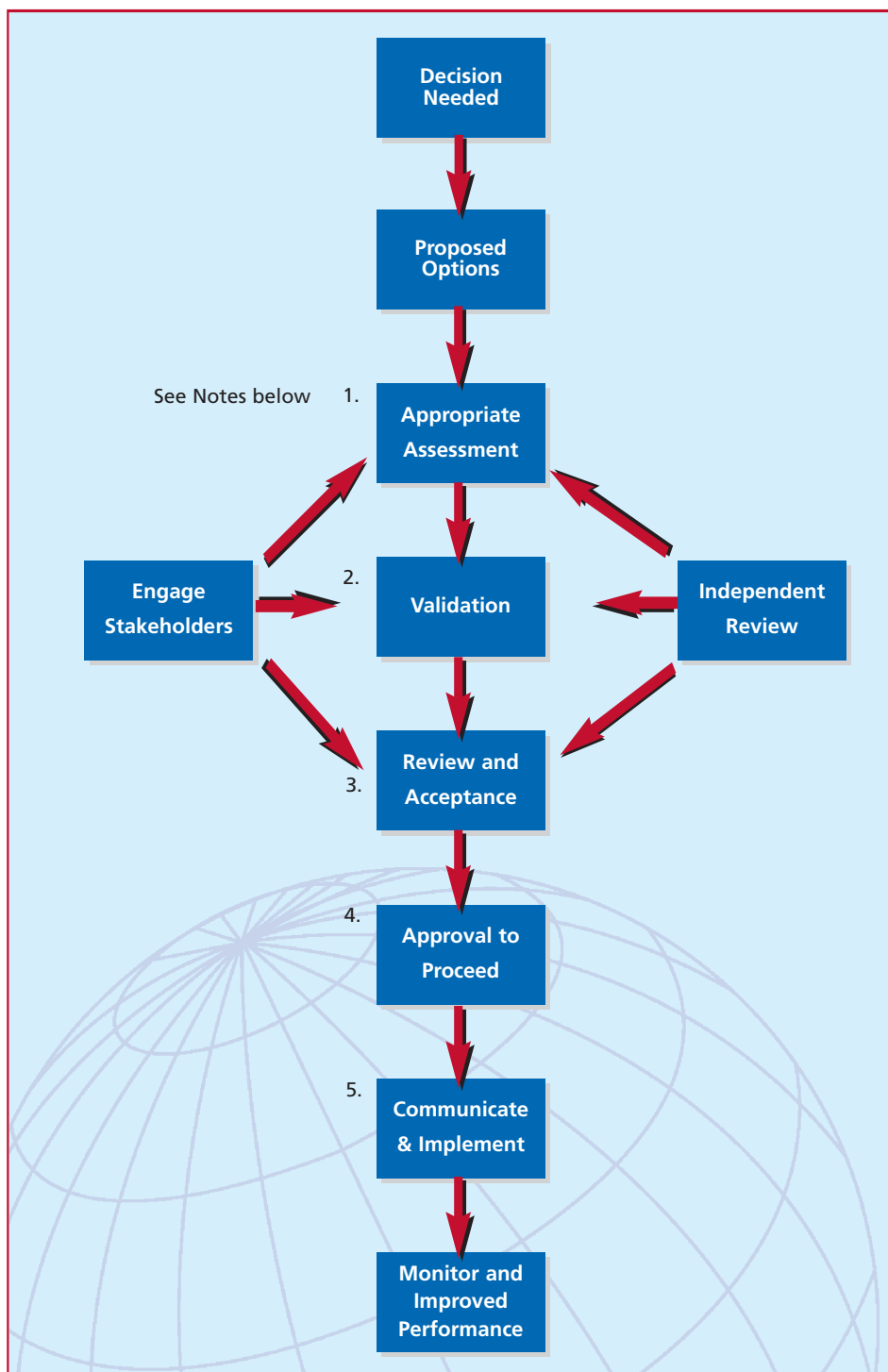
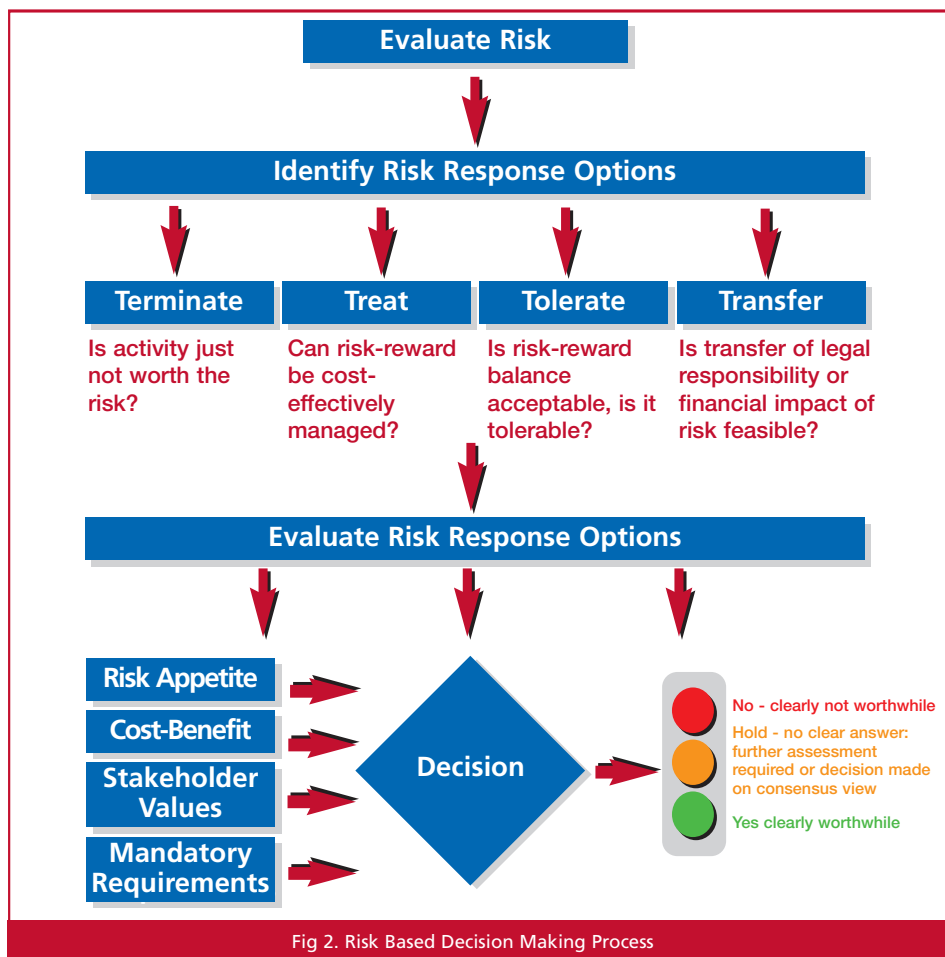


Fig 1. Standard Process for Decision Making

1. The need to change could come from a number of sources, including statutory requirements, internal reviews, audit findings, lessons learned from major incidents, etc.
2. The extent of assessment and documentation will be dependent on the significance of the change. This will range from experience based assessment through to more comprehensive numerical assessment.
3. The extent of review will be dependent on the significance of the proposed change. This will range from internal review through to independent review and involvement of regulatory bodies.
4. The approval body will be dependent on the significance of the proposed change.
5. Implementing the change effectively is arguably the most important step, since it is only at this point that the risk is reduced (see Active Risk Management article, page 4)



further investigation of the underlying issues or a simple consensual decision. Any decision requires an assessment of whether the "residual" risk is acceptable, given the risk appetite of the organisation which, while difficult to quantify, is surprisingly well understood, if subconsciously, within most organisations.

### Practical difficulties

Whilst this process is reasonably straightforward in principle, in practice there can be demanding issues to overcome, for example:

- Ensuring the options have been properly selected and defined.
- Setting assessment criteria, and objectives and their relative importance.
- Identifying risk issues and perceptions.
- Assessing the performance of options against aspects that may not be quantifiable, or which may involve judgements and perceptions that vary or are open to interpretation.
- Dealing with differences in the uncertainties of estimates, data and analyses - it may not be able to provide a fair reflection of the actual differences between the options being considered.

- Managing or avoiding hidden assumptions or biases.

### Common features

The United Kingdom Offshore Operators Association (UKOOA) decision making framework was developed specifically to address these issues, and is the best known within the high hazard industries [Ref.1]. However, effective Risk Based Decision Making processes do have common features, regardless of the business application,

as noted in the recent Rail Safety & Standards Board research review [Ref.2] including;

1. Use of a framework for incorporating societal values/concerns into risk based decisions.
2. Ability to plan and take risk based decisions for the long term.
3. Effective risk based decision making forums both within single companies and cross industry.
4. Clear understanding of the required inputs for and pride in the output of risk decisions.
5. Positive management of the media and transparency of risk based decision making.
6. Ability to take rapid risk based decisions to operate under degraded modes.
7. Co-operation with the regulator(s) leads to co-ordinated risk based decisions.
8. Evidence from experts provides a sound basis for risk based decisions.

### Conclusion

Many organisations in commerce, industry and the public sector have learnt the need for structured Risk Based Decision Making processes after some very painful lessons. Few would state their processes are fully evolved and functioning without problems. Many other organisations are really only now starting their journey. Successfully applied, though, risk based decision making can be both powerful and cost effective.

### References

- 1- Industry Guidelines on a Framework for Risk Related Decision Support, UKOOA, April 1999.
- 2- Decision-making Practices and Lessons from Other Industries, Rail Safety & Standards Board, Report T266, 2004.

For further information, contact Greg Davidson.

Figure 3: Summary of Key Lessons to be Learned from Industries (Ref 2)

Lesson Learnt	Evidence of lesson from the research						Number of industries
	Aviation	Food	London Underground Group	Nuclear	Offshore Oil and Gas		
1 Use of a framework for incorporating societal values/concerns into safety related decisions	○	●	◐	●	●		3.5
2 Ability to plan and take safety related decisions for the long term	●	○	●	●	○		3
3 Effective safety related decision making forums both within single companies and cross industry	●	●	●	●	●		5
4 Clear understanding of the required inputs for and pride in the output of safety decisions	●	○	○	○	●		2
5 Positive management of the media and transparency of safety related decisions making	○	●	◐	●	●		3.5
6 Ability to take rapid safety related decisions to operate under degraded modes	●	○	●	○	○		2
7 Co-operation with the safety regulator leads to co-ordinated safety related decisions	●	●	●	○	●		4
8 Evidence from experts provides a sound basis for safety related decisions	●	●	○	●	○		3

# Active Risk Management

## Risk management by actions not words

If an organisation has not identified a specific risk then there can be little confidence that the risk is being managed. Once identified, an assessment of the risk and the measures in place to prevent it occurring helps to provide this confidence. However, this is only the start of risk management.

Next, a decision has to be made. The risk based decision making process needs to consider the risk-reward balance (see article on pages 2-3).

Although important as part of an overall solution, these steps are pointless unless they lead to real action which achieves real risk reduction and increased organisational resilience.

### Textbook exercises

It is very common to find almost textbook versions of risk identification, assessment and decision-making processes. But when their outcomes are inspected, often the improvement action plans have not been implemented, or only partly so. Even in the cases where the plan is initially acted upon, it can fall into disrepair as a result of not being regularly and accurately monitored.

### Analysis paralysis

In many respects it is philosophically attractive to do the risk analysis. But this process can all too easily become progressively more complex. This "Analysis Paralysis" may be compounded by the search for sophisticated, bespoke solutions, modelled in minute detail.

Furthermore, the "fear factor" of failing

to identify a risk can overwhelm the need to take positive action. But it is only at the point of taking action that a return is made upon the investment in the analysis.

Improving resilience does consume resources and can appear to be of low priority when all seems to be going well. But if an organisation thinks it cannot afford the resources of time or money, it ought to talk to other enterprises who have dealt with the cost and trauma of a major incident.

### No action, no risk reduction

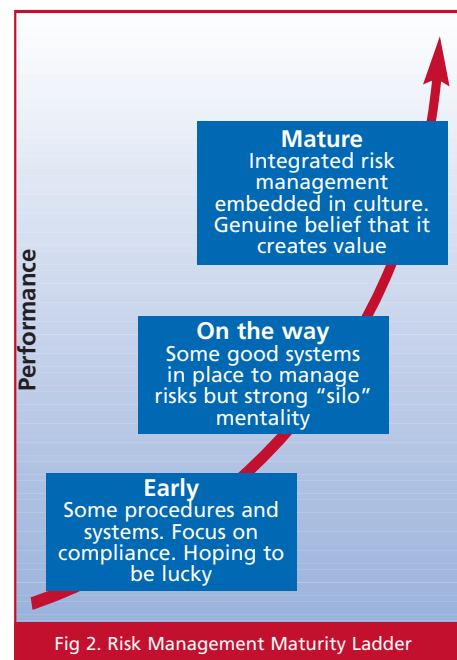
It is surprising how many people need reminding that risk levels will remain the same, or even increase, until real improvements are fully implemented.

Another point that cannot be overstated is that managing risk is about the real, credible threats today. Dealing with these challenges is not an academic exercise. It requires a step change in appreciation of the scale and immediacy of potential risks and in responding effectively to the implications.

### Action plans

Risk management is not viable as an "add-on". One-off exercises might make one-off gains but certainly not lasting, sustainable improvements.

A good starting point is a "framework" that recognises that risk ownership by individuals; understanding, communication, appraisal, monitoring and improvement are at least as important, and arguably more important, than the assessment



that preceded them, see Fig 1.

Different organisations have different cultures, and the "right" way of embedding risk management into day-to-day activities will depend on this culture. A large, hierarchical, formalised organisation is more likely to require documented assessments, risk registers, action tracking systems, and formal risk reporting and assurance processes than a smaller more informal organisation. Nevertheless, most organisations should recognise that there are going to be more advanced risk management cultures than their own, see Fig 2.

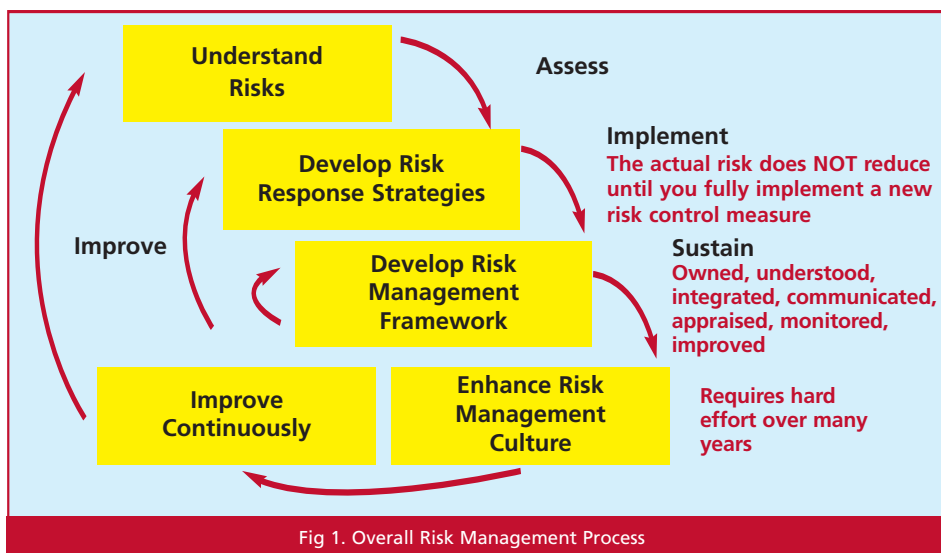
What is common to all active risk management organisations though, is the successful ownership and empowerment for risk reduction action, matched to the organisational structure and competency of individuals.

### Conclusion

Risk management has always been with us and it will continue to present new challenges. As one type of threat is controlled, new threats emerge. And corporate memories can be very short – the recurrence of known risks proves this. Organisations need to deal with them all. More analysis is not the solution. The solution is more action.

*This article was derived from a paper by Robin Currie on Managing the Risk of Terrorism, presented at the International Forum on Airport Emergency and Risk Management, Singapore, January 2005.*

For further information, contact Steve Lewis





# Which QRA Software?

Risktec recently completed a comprehensive survey of software currently available for undertaking quantitative risk assessment (QRA) for onshore and offshore oil and gas facilities. The key requirement was that the software had to be available to users under licence, with full user support. This immediately removed from the search any "in-house" tools developed by consultants.

From an initial list of over 80 tools, only a handful of software products were found that could undertake full QRA. Also, offshore and onshore QRA tools tend to be packaged separately, reflecting the different characteristics that need to be modelled, e.g. offshore evacuation, or onshore far field impact on the public.

What is clear is that there is no single "best" tool designed for both offshore and onshore QRA.

## Key Findings

- There are no commercially available tools for "coarse" QRA at concept selection stage, but some consultants have in-house models.
- There is no single fully "integrated" offshore tool. In practice, most companies develop bespoke, installation - specific, linked spreadsheet models - see Fig 1.
- Onshore is better served and software products are generally well used and accepted. Non-hydrocarbon/ chemical risks (e.g. transport) still need to be quantified "off-line", though they tend to be less critical onshore than offshore.
- A handful of products stand out as technical leaders - see Fig 2.

## Key Selection Criteria

Key factors to consider when selecting QRA software include:

- Scope - what exactly do you want to model and in how much detail? Can the software meet your requirements or will you be overwhelmed by the functionality?
- Repeatability and transparency - are the methods, rule sets and data visible and traceable?
- Cost - how much will licences, training, in-house time and external consultants cost over the long-run?
- Integration - how easy will it be to integrate the processes for managing the software and assessments into your company's management system?

Fig 1. Integrated QRA models versus spreadsheet models

Integrated QRA Models		Spreadsheet Models	
Advantages	Disadvantages	Advantages	Disadvantages
<ul style="list-style-type: none"> <li>• Inclusion of many models in a common computing environment</li> <li>• Models validated against experiment</li> <li>• Software quality assured by supplier</li> <li>• Technical support from software supplier</li> <li>• Available "off-the-shelf" enabling early start of work</li> <li>• Recognised and generally accepted within the industry</li> </ul>	<ul style="list-style-type: none"> <li>• Difficulty of use and understanding - onerous user training and familiarity requirements (but decent results require complex modelling)</li> <li>• Lack of control and flexibility - user unable to modify software (can be an advantage)</li> <li>• Lack of transparency - hidden assumptions and calculation methods, "black box" (requires high quality technical user manual)</li> <li>• High initial and ongoing costs (licences)</li> </ul>	<ul style="list-style-type: none"> <li>• Relatively easy to understand</li> <li>• Lower user training requirements and easier user familiarisation</li> <li>• Good spreadsheet models provide transparent calculations and assumptions</li> <li>• Better control - user able to develop spreadsheet model to level of detail required (flexibility of calculation and presentation)</li> <li>• Lower external cost (but man-hour time can be expensive)</li> </ul>	<ul style="list-style-type: none"> <li>• Prone to errors by the analyst</li> <li>• Can be personal to analyst and difficult to update by others without errors (requires careful QA)</li> <li>• Macro programming can be difficult to check</li> <li>• More time consuming to demonstrate validation</li> <li>• Perception - less sophisticated (when reverse is often true)</li> </ul>

## Risktec Verdict

With apologies to the Top Gear car magazine:

**Risktec survey** - the choice is limited and there is plenty of scope for improvement in the software currently on the market.

**Risktec choice** - spreadsheets for offshore. SHEPHERD for the more complex onshore studies because users can select their preferred physical effects tool.

**Don't be fooled by** - good looks. Users want flexibility and transparency in methods, rule sets and data.

## A Word of Warning!

With apologies to the Lonely Planet guide books:

*"Software always changes - good software usually gets better but sometimes gets left behind, poor software usually goes out of business, new software gets launched, names change - nothing stays the same"*

## Conclusion

Users need to consider very carefully their requirements before selecting specific software.

Often, using one of the onshore products is the best way to proceed. But the complexities of modelling offshore risks mean that most organisations develop their own spreadsheet models to utilise the methods, assumptions and data they understand to an appropriate level of detail.

Organisations with multiple facilities who want a flexible but more robust approach than spreadsheets, have an alternative cost-effective option: to develop their own bespoke model making use of Microsoft.NET and/or ActiveX technology.

For further information, contact Steve Lewis

Fig 2. Leading QRA Tools

Offshore QRA	Onshore QRA - "Integrated" <sup>note 5</sup>	Onshore QRA - "Non-Integrated"
Neptune <sup>note 1</sup>	Safeti <sup>note 3</sup>	Riskcurves + Effects + Damage
Plato <sup>note 2</sup>	Shepherd <sup>note 4</sup>	Riskplot

Note 1 - "Computational workbench" linking modules to MS Excel/VBA

Note 2 - Concentrates on escalation of fire and explosion events taking account of geometry.

Note 3- Incorporates PHAST physical effects tool

Note 4 - FRED physical effects tool is part of suite but user is not constrained to using it.

Note 5 - "Integrated" means that most calculations are done "on-line" within software rather than "off-line" by other tools. SAFETI is arguably more integrated than SHEPHERD

# Getting the best out of consultants

There are many reasons for using a consulting company; a search for objectivity or fresh ideas, the requirement for skills and experience you don't have, or simply the need for an extra pair of hands. At the right time and for the right reasons the use of consultants can be invaluable. But how do you make best use of a consultancy?

## 1. Be clear on the purpose, scope and objectives of your task:

If you don't know where you are going, any path will take you there! Be clear on the scope, purpose and objectives of the task you want the consultancy to deliver. The sign of a good consultancy is an enthusiasm to help you clearly define the scope of your task, while placing your interests ahead of its' own.

## 2. Choose a style of working which best suits your organisation/project:

There are a number of ways you can use consultants, depending on your circumstances, ranging from reimbursable secondments into your office, to lump sum work packages, and full risk-reward outsourced service level arrangements. Structure your approach to achieve the level of control and accountability you are looking for and have an exit strategy if things don't go the way you want.

## 3. Know what you are looking for:

Be clear in your own mind how you will judge the success of your consultant's work. This will help you think through what results you are looking for and allow you to share a common understanding with your consultant. As a result, the consultant is much more likely to deliver what you want when you want it.

## 4. Utilise your consultant's process:

Through their experience of having delivered many different assignments for clients across a wide range of disciplines and industries, consultancies

will have evolved a series of tried and tested approaches which allow them to reach a satisfactory conclusion. A good consultancy will always tailor its services to meet your requirements.

## 5. Provide lots of feedback:

Good consultants should be very focused on customer satisfaction. But do let them know what they are doing well and what they can improve on. This feedback will help ensure they deliver what you want and, in the longer term, will help them adapt to serve you better in the future. It is useful to have contact with a senior person in the consulting company to help handle any sensitive issues which may arise.

## 6. Develop a long-term relationship with your consultant:

The more you work with the same consulting company and their people, the more they learn about your organisation and culture and vice-versa. In addition, they will take a personal interest in your success. This relationship will benefit both parties in many ways. Even when the consultant is serving others, they are gathering new skills and experiences. This will benefit you when they return to help you on your next task.

The optimum client/consultancy working arrangements for a particular activity must be determined on a case-by-case basis. It is in the interests of both the client and consultant to

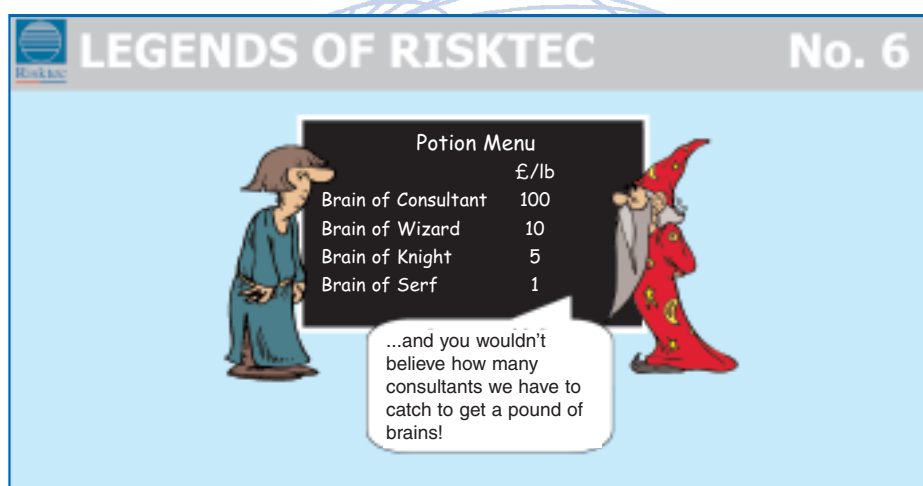
## Did you know ... consultants can make you laugh?

Things you might hear a consultant say (or not):

- Everything looks okay to me. I'll see myself out.
- You're right, we're billing far too much on this job.
- Bet I can go a week without saying 'holistic'.
- I'm not sure. Can I phone a friend?
- I think you just need a few more people working on this.
- Please don't tell my mum I'm a consultant. She thinks I work in a strip club.
- I don't know much about this, but I do come from more than 50 miles away.
- What do you think?
- If you already had a watch, why did you ask me the time?

get these arrangements right. Often the consultant will have more experience of what works and what doesn't. So, seek their advice at an early stage and develop these arrangements together.

For further information, contact Gareth Ellor



For further information, contact Risktec Solutions at: **Email** - [enquiries@risktec.co.uk](mailto:enquiries@risktec.co.uk) **Website** - [www.risktec.co.uk](http://www.risktec.co.uk)

### UK Principal Office

Wilderspool Park  
Greenalls' Avenue  
Warrington  
WA4 6HL  
Tel +44 (0)1925 438010  
Fax +44 (0)1925 438011

### Aberdeen Office

Riverside House  
Riverside Drive  
Aberdeen  
AB11 7LH  
Tel +44 (0)1224 224454  
Fax +44 (0)1224 224455

### Glasgow Office

Hillington Park  
Innovation Centre  
1 Ainslie Road  
Hillington  
G52 4RU  
Tel +44 (0)141 585 6354  
Fax +44 (0)141 585 6301

### Malaysia Office

MNI Twins  
Tower 2, Level 7  
Jalan Pinang 50450  
Kuala Lumpur, Malaysia  
Tel +603 2168 8352  
Fax +603 2168 8485

### Falck Global Safety

Verbeekstraat 4  
2332 CA Leiden  
The Netherlands  
Tel +31 71 572 7734  
Fax +31 71 572 7735