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?

<table>
<thead>
<tr>
<th>Integrated QRA Models</th>
<th>Spreadsheet Models</th>
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<tbody>
<tr>
<td><strong>Advantages</strong></td>
<td><strong>Disadvantages</strong></td>
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<tr>
<td>Inclusion of many models in a common computing environment</td>
<td>Difficulty of use and understanding – onerous user training and familiarity requirements (but decent results require complex modelling)</td>
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<td>Models validated against experiment</td>
<td>Lack of control and flexibility – user unable to modify software (can be an advantage)</td>
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<td>Software quality assured by supplier</td>
<td>Lack of transparency – hidden assumptions and calculation method, “black box” (requires high quality technical user manual)</td>
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<td>Technical support from software supplier</td>
<td>Available “off-the-shelf” enabling early start of work</td>
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<td>Recognised and generally accepted within the industry</td>
<td>High initial and ongoing costs (licensing)</td>
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**Fig 1. Integrated QRA models versus spreadsheet models**

**Fig 2. Leading QRA Tools**

**Offshore QRA**
- **Neptun**
- **Plato**

**Onshore QRA – “Integrated”**
- **Safeti**
- **Shepherd**

**Onshore QRA – “Non-integrated”**
- **Riskcurves + Effects + Damage**
- **Riskplot**

**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, including office contact details, visit: [www.risktec.co.uk](http://www.risktec.co.uk) or email: enquiries@risktec.co.uk