



“We quickly realised the software expertise required was beyond our own in-house capability. We already had a relationship with Tessella and knew they were perfect for this type of complex work because of their strengths in technical modelling and professional software development.”

Steve Lewis
Project Director, Risktec

Tessella and Risktec improve safety at Kashagan Field with pioneering new approach to quantitative risk assessment.

Kashagan Field consortium turns to Risktec and Tessella to more accurately assess risk and plan safety in high H₂S environment.

Business Background and Challenge

The Kashagan Field is situated in the northern part of the Caspian Sea close to the Kazakhstan city of Atyrau. Kashagan is the world's second largest oil field, with estimated commercial reserves of between 9 and 16 billion barrels of oil.

The field is being explored and operated by an international consortium under the North Caspian Sea Production Sharing Agreement. The Agreement is made up of 7 companies consisting of Eni, Shell, Total, ExxonMobil, KazMunayGas, ConocoPhillips and Inpex.

Development of the field is difficult because of the harsh offshore environment, where sea ice is present in winter and temperatures can range from -35 °C in the winter to 40 °C in the summer. More significantly the oil is light with a high gas-oil ratio and a very high hydrogen sulphide (H₂S) gas content of about 20%.

H₂S is highly toxic and corrosive, and can pose a significant threat to personnel exposed to leaks. This type of environment places increased importance on the accurate assessment of risk, which is a key input to the design and planning of facilities, working patterns and emergency response.

There are a number of off-the-shelf industry solutions for Quantitative Risk Assessment (QRA), however the consortium felt these packages lacked the transparency and flexibility required to more accurately assess the risk for their specific environment.

They therefore decided to go out to tender for the design and development of a bespoke QRA system that would provide them with a more cost-effective, flexible and accurate alternative to an off-the-shelf package.



The Solution

One of the companies invited to tender was Risktec Solutions, an independent specialist in risk management consulting and training.

Steve Lewis, Project Director at Risktec explains further, "We received the invitation, but quickly realised the software expertise required was beyond our own in-house capability. We already had a relationship with Tessella and knew they were perfect for this type of complex work because of their strengths in technical modelling and professional software development."

Tessella was immediately able to demonstrate its value by reshaping the requirements. Originally a system based on MS Excel spreadsheets had been specified. Tessella was able to show that the volume of data involved would mean an Excel solution would be error-prone, difficult to maintain and not scalable for use by a large number of users.

A bespoke software solution based around an SQL database was adopted and Risktec and Tessella were selected to work on the project. An iterative development process ensured the solution met the core requirement of more accurately assessing risk in a high H₂S environment.

Requirements

- A flexible, transparent and cost-effective way of accurately assessing risk in a high H₂S environment, especially compared to standard off-the-shelf QRA packages
- A robust, reliable solution capable of scalable development and easily shared by users in multiple locations
- A professional software development consultancy with proven expertise in technical modelling and algorithm development

Business Benefits

Steve continues, "The solution has exceeded expectations. Because it is fully transparent and flexible, down to control over all variables used in the algorithms, it has enabled a more sophisticated, tailored and comprehensive level of risk analysis, especially compared to off-the-shelf packages. The solution is also very reliable and easily shared by users in different locations."

The system is now being used to perform complex "What If" sensitivity analyses, plot risk levels and support risk-based decisions.

Steve adds, "The system is easily justified, especially against the high cost of corporate licences for standard QRA packages, but more importantly it supports more informed planning and design for safety, especially for plant layout, manning and protection of workers. Overall this innovative approach to quantitative risk assessment will help achieve the challenging field development programme, while enabling higher levels of safety."

Benefits

- Innovative new approach to QRA
- Tailored and consistent QRAs over the lifetime of the field development, enabling higher levels of site and personnel safety through better planning and design of facilities, plant and working patterns
- Ultimately, better informed decisions supporting faster and safer development of the Kashagan field

Tessella plc 26 The Quadrant, Abingdon Science Park, Abingdon, Oxfordshire OX14 3YS, UK
T: +44 (0)1235 555511 | F: +44 (0)1235 553301 | E: info@tessella.com

Tessella Inc 233 Needham Street, Suite 300, Newton, MA 02464, USA
T: 1 617 454 1220 | E: info@tessella.com

Tessella – successfully delivering IT and consulting services to world leaders in R&D, science and engineering.

For decades, Tessella has been successfully delivering IT and consulting services to world leaders in R&D, science, and engineering. Through the application of scientific methods and rigorous quality procedures, we enable clients in life sciences, energy, the public sector, and consumer industries to achieve a wide range of objectives, including, forecasting floods, developing fusion power, enhancing military sensor capability, improving drug discovery and development efficiency, and reducing risk to health and the environment in the extraction and production of oil and gas. With offices in Europe and North America, global companies rely on Tessella for business critical assignments.

Copyright © Tessella plc 2009, all trademarks acknowledged. Issue: V1.R0.M0 | Nov-09



www.tessella.com