The purpose of the meeting was to look at Quantitative Risk Analysis as the systematic and comprehensive methodology for helping to answer the following questions:

\[ \sum \text{How likely is a risk to occur?} \]
\[ \sum \text{How severe are the consequences should that risk occur?} \]

Providing numerical estimates of the likelihood of occurrence (probability / frequency) and the consequence (cost / schedule) allowing clients to understand their risk exposure better – to people, business, the environment, markets or other areas of interest. Showing how the output of the analysis supports business investment decision making and minimises disruption.

The seminar aimed to bring together those in a number of different industries who have real-life experiences and examples of the use of quantitative risk analysis, looking at the benefits of the right interpretation – from safety through to launching a space shuttle.

This was a well attended event with 57 people turning up on the day to listen to the 6 speakers who gave insights into the seminar topic. The seminar took place in the picturesque Birchwood golf Course (though no one slipped away for a quick game!) in Warrington. The venue and refreshments were sponsored by Sellafield Ltd, we are grateful to Sellafield for sponsoring the venue and refreshments.

Most of the presentation slides are on the Website alongside this brief summary.

**Neil Dunkerley, Project Risk Analyst, EC Harris**, started the seminar. An important element of the work that Neil has undertaken over the last 20 years is the calculation of target costs for collaborative alliance using this experience to talk about Project Risk Analysis – a review of the application and outputs of risk analysis. His presentations focused on looking at how undertaking quantitative risk analysis can enable a client to gain confidence in both cost and schedule forecasts. He gave a brief overview of the tools that are available and being used by his company and the reason behind why it is important to use Quantitative Risk Analysis. Specifically describing how quantitative risk analysis is used in the rail network engineering works where time is vitally important, fines are imposed when the rail networks are not running over scheduled unavailability. The tool used is Wave analysis which Neil went on to describe what it was and how it was used.

The next presenter just before lunch was **Usman Chaudry, Principal Advisor, Financial Risk Management, KPMG**. Usman has been a key member of the EMEA analytics training team, sharing best practices in portfolio analytics across business divisions. His core experience lies in the technical development and implementation of retail credit models, both for Customer Management and Basel 2. His presentation drew on his personal experience of Stress Testing and Scenario Analysis in the
financial industry setting the scene with examples of recent extreme events including Japanese Earthquake in 2011, Banks failing in 2007 and Euro Zone crises 2011 - looking at what is stress testing, its use to determine the stability of a given system or entity, or fatigue testing for metals in industries, and specifically in financial services it is the resilience of the firm to adverse scenarios, as an important supplement to risk management. Stress testing relies on past experience and use statistics and expert knowledge to infer what the resilience of the system is, looking at several risks that could have a significant impact on an institution. He talked about the range and methods for stress testing as well as reverse stress testing. The Regulators interest in an integrated approach to stress testing was noted. He finished with what the banks should be doing.

Dr Michael Frank, Head of Risk at Sellafield, was the first presenter after lunch. He is the author of nearly 100 papers related to risk; engineering and decision issues associated with nuclear plant operations, artificially intelligence and space systems. He spoke on the application of quantitative risk analysis from personal experience in aiding the decision to launch the Cassini Spacecraft. A presidential directive was issued that safety was the single decision, the scope of work to ensure safety included quantitative risk analysis and these results were presented back to the president, which Michael was part of and attended the meeting. The main driver for this analysis was safety, not cost as it was not important so long as it stayed within the budget. Michael’s talk around what the main areas of the space shuttle gave the greatest safety concerns, and what this would mean to the voting public.

The fourth presenter just before afternoon break was Penny Roberts, Turner Townsend. Her main areas of expertise are Planning and Project Controls though she has extensive knowledge and experience of risk management. Her presentation drew on this knowledge and experience during her consultancy on the new terminal for Heathrow. The presentation looked at the challenges which the project face in predicting the opening date for a new terminal at Heathrow Airport, where there were 6 teams working at programme level, the same contractor was not used for all phases. Penny spoke about the challenges to achieving a consistent approach across the projects that the project faced and the questions that arose, she talked through the decisions that had to be made including the differences in opinions of the various contractors, the process by which the group made the decision and the outcomes, giving examples. The ultimate outcome was a Quantitative Risk Analysis model giving a P50 date for the opening of the new Heathrow Terminal which the project is working towards, routinely monitored and updated.

After the break the fifth presenter was Elizabeth Mathie, Safety Risk Modelling Manager, Highways Agency. Elizabeth has been with the agency for around 4 years and has been responsible for the safety risk model that is described during the presentation, from a proof of concept version, the beginning of its development. To the current fully functioning strategic model. The theme of her presentation was Forewarned is forearmed, balancing risks and resources. She gave an overview of the Highways Agency and the statistics behind the roads that they look after. The safety risk model was developed to help the agency understand the safety risks and the main factors driving these risks, informing the priorities for investing and allocation of resources, examining the potential safety implications of any changes on the network and exploring how any safety performance targets could be achieved. Elizabeth
explained how the safety model is structured. She presented actual outputs from the model and how these are used; including the difference from the Agency’s traditional reporting. In conclusion normalisation of safety data gives an extra perspective and important information which can provide additional insight to safety decision making when considered alongside simple counts of accidents or casualties.

The final presenter closing a very full day was Wendy Owen, Arcadis. Wendy has 22 years experience in system Safety and Reliability across a range of industries. Wendy used her extensive knowledge and experience drawing upon her Arcadis experience of working for clients predominately in the nuclear, Process, Transportation and Defence Sectors to talk about risk assessment for high hazardous industries. She posed the question to quantify or not to quantify? - level of quantified risk assessment vs qualitative risk analysis that needs to be understood. Wendy used an example she had worked on to highlight qualitative vs quantitative. One important point that was discussed was that accuracy of a model is more important than the precision of the numerical risk data output from it, the accuracy of the model vs precision of results to support decision making. In conclusion in an ideal world, all hazards would be eliminated by design therefore QRA wouldn’t be needed. However, this doesn’t happen in real life.

Lynn Stalker
IRM North West
27th June 2012