



Tessella works with BP to develop new modelling tool to keep people safe on BP's offshore facilities

As one of the world's largest energy companies, BP has massive global investments in oil and natural gas exploration and production.

To maintain and run these facilities requires large numbers of people – people whom BP is committed to keep safe. BP constantly strives to eliminate or minimize the risks associated with producing and transporting oil and gas, for the benefit of its own staff, the public and the environment alike.

BP's Major Accident Risk (MAR) team specializes in assessing and modelling the major accident hazards associated with BP's operations. Major accidents, in this context, are those resulting in severe safety or environmental consequences. Led by BP experts Mike Considine and Dave Fargie, the MAR team had developed specialist tools for modelling onshore and offshore facilities, but recognized that their offshore model suffered from a number of drawbacks.

As Dave puts it, "Although the offshore tool understood the concepts of regions, populations and hazards for a platform, it did not contain any real spatial information. Essentially, the tool relied on the user's individual expertise to assess the likely impact of an event such as an explosion or fire, requiring judgements about what the

consequences of an event may be. For instance, will a fire at a given point generate smoke that makes an evacuation route impassable? This reliance on individual expertise meant that, whilst the tool was undoubtedly valuable for risk management, its use was limited to specialists, and since the package relied on individual judgement, this could result in varying results."

In early 2007, Tessella and BP began working on a radically re-thought implementation of the offshore modelling tool. Instead of relying on complex spreadsheets to model offshore facilities, Tessella prototyped a package that allowed the user to graphically construct a model in three dimensions.

Tessella's project manager for the work, Andrew Bowen, takes up the story: "The aim was to let the modeller see the facility on the screen, matched to the original two dimensional facility plans, but with the ability to zoom and fly through the model in 3d. We wanted to give the user a much better feel for the 3d nature of offshore facilities, and how the elements in an offshore facility hang together." BP was impressed by the prototype system's user interface, and even more impressed by Tessella's record in major accident risk models for other oil and gas clients.



In the summer of 2007, Tessella began work on the first implementation of a full, 3d modelling tool. Not only did this need a sophisticated user interface, but the backend risk models had to be robustly implemented and carefully validated. Andrew's developers at Tessella distilled more complex models of fire and explosion propagation into a single package.

Mike explains, "Each event that we model, say a release of hydrocarbon gas, can have multiple outcomes. In the case of a gas release, it might ignite immediately, resulting in a fire, or it might ignite after a delay, so then there's the risk of an explosion. Or it may not ignite at all, but then we still need to look at the environmental impact. We have to look at the immediate consequences of a modelled event, and all the knock-on effects that can happen afterwards – for example how people move to areas of safety if escape routes are impaired. For a structure as complicated as an oil rig, the number of possibilities can be truly enormous."

Despite the complexity of the software, Tessella delivered a working modelling tool to BP at the start of 2008. The new offshore modelling package, christened OMAR, will add another tool to BP's fight to minimize risks and keep its staff, the public and the environment safe.

"OMAR will give us a better tool to help prevent the occurrence of a serious accident on our facilities," says Mike.

"This is a tool that will make a real contribution to keeping people safe on our offshore facilities," adds Dave. "Modelling offshore facilities in OMAR will help us to target our investment towards the biggest safety gains, and to identify the most effective remedial actions."

To find out more about Tessella's experience and capabilities in the energy sector, please email info@tessella.com

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