HSE: Oil & Gas

Improving safety and protecting the environment.

A New Frontier

Balancing the rising demand for oil and gas with the challenge of extracting dwindling reserves is driving a new approach to HSE.

Exploration is pushing into more difficult, often unchartered environments, and production is under pressure from increased competition and tightening budgets. Recent high profile incidents demonstrate how these new challenges can translate into higher risks, and increasingly higher costs in terms of loss of life, the environment and impact on the business.

This puts HSE teams under increased pressure to meet the demands of the E&P groups who are tasked to further maximise and target finite resources, as well as develop custom solutions to new environments where one size no longer fits all; a challenge that is compounded by the number of knowledgeable and experienced HSE practitioners retiring from the industry.

The good news is that HSE in Oil & Gas is rapidly changing and adapting.

Forward-thinking Energy organisations have not only adopted a more holistic approach to HSE - encompassing people, process, training, leadership, communications and culture - but are also embracing new technology and software in order to better leverage and scale HSE resource, and equip the organisation with the right tools to solve today’s unique challenges.

Working with Tessella

Tessella has a 30 year track record of providing innovative consultancy and technology solutions to the world’s largest energy and petrochemical companies covering a wide range of "upstream" and “downstream” activities, including leading edge projects in HSE.

This depth of domain experience combined with the quality of our scientifically qualified consultants enables us to work closely with Oil & Gas businesses to quickly assimilate, add value and translate outline requirements into innovative and pragmatic software solutions.

In terms of HSE, this means equipping the organisation with tailored and powerful new ways of efficiently assessing and prioritising risk, mitigating risk by visualising and modelling consequences and proactively monitoring asset condition.
Customisable Risk Assessment and Analysis

Working on some of the largest and most difficult exploration projects has enabled us to develop a highly scalable software framework for assessing and prioritising risk, allowing finite HSE resource to be efficiently targeted at infrequent large consequence events as well as more frequent smaller consequence events.

Using a bespoke algorithm based software environment provides a more robust and easier to share solution than using spreadsheets. To facilitate this approach Tessella have developed a set of tools that can be used to accelerate the rollout of bespoke HSE solutions. These include 3D rendering and schematics for use on complex offshore structures, innovative contouring software to help understand the complex interplay between events, and interactive 2D plans that enable HSE consultants to rapidly explore and analyse environments. In addition, the Tessella approach provides full access to all parameters, algorithms and rules which means it can be fully customised to accurately match unique challenges – from deep water exploration to high H2S content fields – allowing HSE teams to more confidently justify key decisions.

Risk Mitigation and Consequence Modelling

Combining our Oil & Gas experience with our expertise in mathematical modelling and simulation enables us to develop tools that help HSE teams better analyse and mitigate risk by exploring the likely consequences of individual events in more detail. This can include 3D modelling of explosion and fire propagation, 3D representations of key structures, workforce distribution modelling, and offshore accident and hazard modelling.

This work can be undertaken in a number of different ways from simply implementing proven models, through collaborating with customer HSE experts to develop specific models, to independent guided research into new models.

Asset Condition Monitoring and Management

Tessella have developed a unique software environment for proactive Asset Condition Monitoring and Management. The system is designed to maximise plant uptime and predict problems before they happen. This enables repair and maintenance to be proactively and safely scheduled, and helps avoid major failures or last minute intervention that puts workers at higher risk.

Through regular automated assessment, the software can spot gradual onset failure, such as slow leaks or a stretching chain. The alert thresholds are defined in the software by the operator either as a hard limit or as a % change from the benchmark. In addition to using the total amount of change as an alert trigger, the software can also use how fast something is changing, or how variable that change is, to predict in advance when component degradation will cross a threshold.

The system can be tailored to individual needs including configuration of alerts and guidance to operators on how to respond. This allows an exact match to the organisation’s required tolerance settings, risk profile and intervention strategy.

Summary

As well as leveraging our extensive Oil & Gas experience and software assets to accelerate the use of technology in HSE, our consultancy and scientific software development expertise can also be used to bring forward existing programmes. This can include business and strategy analysis, technical and quality audits, team augmentation and fully project managed bespoke development.