About DNV GL

DNV GL is the technical advisor to the oil and gas industry. From project initiation to decommissioning, we enhance safety, increase reliability and manage risks in projects and operations.

Our oil and gas experts offer local access to global best practice in every hydrocarbon-producing country. Driven by a curiosity for technical progress, we provide a neutral ground for collaboration; creating competence, sharing knowledge and setting industry standards.

Our independent advice enables companies to make the right choices. Together with our customers, we drive the industry forward towards a safe and sustainable future.

www.dnvgl.com
BARRIER-BASED INCIDENT INVESTIGATION

DNV GL BSCAT™: Combining root cause analysis and risk assessment

From project initiation to decommissioning, DNV GL’s oil and gas experts work in partnership with customers to enhance safety, increase reliability and manage risks in projects and operations. Modern safety management systems require investigations using a root cause technique to find the deeper system failures behind an incident, and implement findings that prevent such incidents from recurring. To assist operators, DNV GL has updated its established systematic cause analysis technique (SCAT™), incorporating barrier-based bow-tie risk analysis. The resulting BSCAT™ approach delivers a powerful and easy-to-understand causation diagram, developing internal knowledge, facilitating communication and ensuring that lessons are learned and linked to facility risk assessments.

Solving key challenges with BSCAT™

Link root causes and risk assessment

By using the BSCAT™ approach, investigations can provide deeper understanding of incident risk, building on barrier-based risk management while still identifying management system root causes.

Learning from incidents

Learning from incidents is crucial if operators are to implement effective solutions. BSCAT™ provides lessons on degraded barriers before major incidents occur.

Visual risk communication

By providing easy-to-understand graphics that show incident progression and the role of degraded barriers, BSCAT™ facilitates the communication of even complex accidents to staff, management, regulators and the public. BSCAT™ is the next generation of visual investigation tools.

Process management

BSCAT™ is both a methodology and a Windows® software tool. It has been designed to integrate with existing processes and systems (such as the DNV GL Synerg™ incident reporting and action tracking tool).

Training

DNV GL provides customized training suitable for technical staff and supervisors. Training covers the bow-tie risk methodology and its use in facility operational risk management. It shows how to create incident bow-ties and how to apply SCAT™ to each barrier in turn - including a clear progression from ‘immediate cause’ to ‘root cause’ and ‘actions for improvement’.

Consulting

DNV GL can assist with investigations by providing specialists to support investigations or to carry out independent analysis. In addition to our experience and expertise, our resources include laboratory facilities in key global locations.

Software

DNV GL has partnered with CGE Risk Management, the creators of the BowTiX™ risk package, to fully integrate the tool with BSCAT™. This enables operators to import pre-existing bow-ties into analysis and to export results back to the risk assessments to keep bow-ties up-to-date and to reinforce the facility risk assessment in every investigation.

The BSCAT™ Tool

DNV GL’s systematic cause analysis technique (SCAT™) is a proven incident analysis approach that has been used by oil and gas companies for nearly three decades. It incorporates human error as well as technical faults, and also underpins the DNV GL Synerg™ incident database tool.

SCAT™ tracks incident causes from immediate causes, through basic or root causes, to recommended actions for improvement.

BSCAT™ builds on the SCAT™ approach, investigating barrier failure in the same way (see diagram, right), but ensuring that results and lessons learned are communicated more clearly.

The BSCAT™ Tool incorporates a timeline tool (STEP) from CGE Risk Management that helps both the analyst and the reader to understand the progression of an incident. An extract from a sample STEP chart is shown to the left, with time increasing across the page and the state of different actors down the page.

The combination of the STEP timeline with the BSCAT™ graphical sequence clearly sets out the accident progression.

Barriers are then identified and SCAT™ applied to each barrier failure to understand the management system root causes and for barrier failure and the changes required to prevent re-occurrence.

By linking the output of the BSCAT™ investigation to the original bow-tie for the event, the focus of the investigation is more focused into why key barriers / safeguards failed and how these may be upgraded to protect against potentially more serious events in the future.

For more information, visit www.dnvgl.com/services/incident-investigation-1095