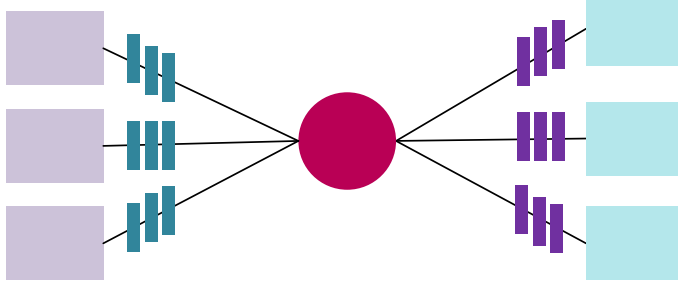




Hazard Identification and Risk Assessment

Pegasus Consulting Support (Pegasus) provides highly skilled and experienced consultants across a wide range of sectors to solve problems, improve performance and manage risk. Pegasus specialises in analysing and understanding the combined performance of technology, people and organisational processes. Pegasus consultants have extensive experience in applying these skills to complex and critical organisations and activities to develop practical and accessible tools and solutions.

Pegasus consultants have extensive expertise and experience in supporting clients with hazard identification, risk assessment and ALARP demonstration across a wide variety of organisations and sectors. Often Pegasus consultants work in highly regulated sectors where adequate assessment and management of risk is required to be demonstrated to a 3rd party regulator.



Risk Management

Pegasus provided risk management support to development of strategic level advice to the European Commission on assurance of EU Natural Gas Supply security and resilience to malicious damage.

Pegasus developed a simple EU Gas Supply model (in a Rich Picture format) which illustrated the need for an integrated approach to assuring Gas Supply security.

The work utilised the Security Vulnerability Assessment (SVA) model from API guidance to develop a Summary Top Event Model with example Preventative, Control and Mitigation Countermeasures (in a Bow Tie format).

Pegasus can analyse systems, processes and facilities to prepare qualitative and /or semi-quantitative risk assessments in support of safety studies and formal safety cases /reports.

Pegasus identifies hazards and determines associated risks by applying techniques which best fit the specific requirements of the organisation, facility, activities and hazards. The analysis may require simple or complex assessment(s) and utilise techniques spanning qualitative, semi-quantitative and quantitative analysis. Some examples include:

- HAZID
- HAZOP
- What-If Analysis
- Layers of Protection Analysis (LOPA)
- Bow-Tie Analysis
- Influence Diagrams
- ALARP Demonstration
- Performance Influencing Factors Identification and Optimisation
- Staffing Arrangements Assessment, Review and Improvement
- Human Performance Analysis

Results can be used to develop simple or complex models of systems to support decision making for risk reduction, reliability improvement and operability optimisation.

From Pegasus' client contact to Pegasus' consultant: *"I don't think I thanked you for this – if not many thanks – it does look as if you have tidied things up and got me out of a jam."*

End client Task Manager feedback: *"I am not a technical expert but the report looks very professional and is just what we were looking for."*

Project Process Safety

Pegasus provided process safety support to a wide range of Refinery engineering projects including design input, chairing Human Performance Analysis, Design Reviews, Bow-Tie Analyses, LOPAs, SIL Assessments, Hazard Studies 1, 2, 4, 5, 6, as well as 3 (HAZOP) as required to enable COMAH compliance and Safety Report revision.

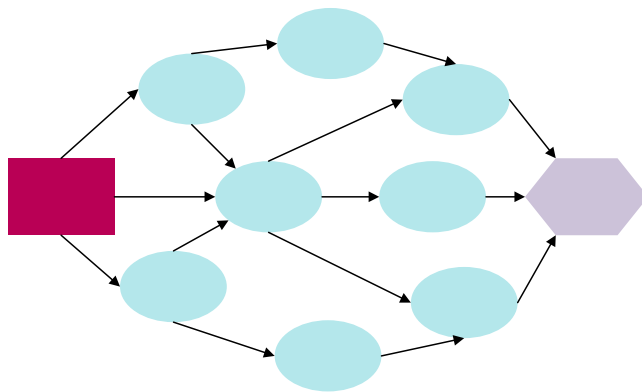


Risk Assessment and ALARP Demonstration

Pegasus determined, characterised and assessed the hazard and risk (qualitatively and quantitatively) associated with an uncontrolled exothermic reaction hazard at a refinery. Risk reduction options to progress control of the hazard towards ALARP were identified, explored and assessed (technically, qualitatively and quantitatively). Immediate, Short and Medium Term combinations of risk reduction measures were proposed and their effectiveness assessed (technically, qualitatively and quantitatively) to provide the basis for an ALARP demonstration argument.

The study utilised a wide range of techniques and tools including Statistical Analysis (for analysing plant operational data to characterise the hazard), Bow Tie Analysis, Fault and Event Tree Analysis, Consequence Modelling, process state transition diagrams showing risk reduction measure relative positions and process engineering modelling and calculations to provide technical substantiation. The hazard characterisation included the development of a reaction specific risk matrix based on the degree of exotherm predicted for component concentrations and operating temperature.

The report was submitted to UKHSE under the COMAH Regulations and Pegasus were directly complimented by the Major Hazards Unit on: *“The high quality of the report, the quality of hazard characterisation, sound demonstration of safety and the evaluation and demonstration of risk reduction measure effectiveness.”*



Pegasus supports public and private sector organisations to explore, define, implement, review and improve their:

- Processes and systems;
- Organisational design and culture;
- Leadership
- Technology;
- Performance; and
- Reduce risk.

Site Process Safety

Pegasus provided site wide support across several facilities working closely with client Operations and Technical function staff to achieve regulatory compliance and apply demonstrated good practice across a wide range of topics.

Support included identifying MAH scenarios; scenario analysis using BTA; identifying critical risk reduction measures and prioritising criticality for asset integrity management and task support requirements; reviewing adequacy of previous work (HAZOP, consequence assessment, all aspects of Safety Report, SIL assessment and IEC61508 implementation) and implementing improvements; PSPI development and implementation; PSMS review and implementing improvements including developing process safety incident investigation tools; process safety incident investigation; identifying improvements required and implementing: plant /process design, process control, Safety Instrumented Systems, procedures, task design, staffing arrangements, competency assurance, management of change, process safety culture, emergency response arrangements, asset integrity management.

Pegasus provided support prior, during and after regulator meetings.

Pegasus Consulting Support Clients

Aquatera	Tata Steel Projects
Bindmans LLP	TOTAL LOR
Ecologic	Unilever
GrowHow	
Murco Petroleum	
Tata Steel	

Contact Details

Helen Conlin

T +44 (0)1490 720450 M +44 (0)7891 841154
E helen@pegasusconsultingsupport.com

Pegasus Consulting Support

Paradwys, Bryneglwys
Near Corwen, Denbighshire
LL21 9LL, UK