



Abbott Risk Consulting Ltd

Oil and Gas Consultancy

Managing Risk
Improving Performance

About Abbott Risk Consulting (ARC)

Abbott Risk Consulting (ARC) has established a strong international reputation for safety, engineering and risk management both at home and around the world.

The company was established in 2002 with 20 employees and has quickly grown to become a successful consultancy with a loyal customer base. Today we have more than 120 highly qualified and experienced safety engineering and risk management consultants supporting clients in the nuclear power, defence, oil and gas, transportation and renewable industries.

High growth has been made possible by the enthusiasm of our people, their flexibility and commitment to delivering quality solutions to time and budget. Our clients recognise these qualities – most of our new work comes from existing clients and many have established long term framework agreements with ARC.

Our people have extensive experience of helping clients comply with the regulatory requirements laid down by organisations such as the Health and Safety Executive. We work on behalf of clients across all industries, in both the public and private sector. We are committed to extending our skills base through continuous professional development and alliances with other industry experts.

“Our objective is to continue to grow and to maintain our position as one of the world’s leading independent safety and risk management consultancies.”

John Abbott
Managing Director
Abbott Risk Consulting



High Quality Technical Resource

Our qualified and experienced consultants are drawn from a variety of industries and disciplines.

- Most have first degrees in engineering or the sciences and a number have further degrees such as an MSc, PhD or an MBA. We maintain close links with academic and professional institutions to ensure continued development.
- The majority of our people are registered with the UK Engineering Council as Chartered Engineers (including Fellows).
- Specialist subjects include process, chemical, mechanical, electrical, electronic, nuclear and offshore and marine engineering. We also have mathematicians, physicists, chemists and environmental scientists.
- In addition, we have a large database containing details of associate consultants (60 of whom are currently actively engaged on projects).
- ARC has wide experience across high hazard and highly regulated industries; specifically in onshore and offshore oil and gas, petrochemical, civil nuclear, defence, renewables and marine sectors.
- We develop our staff through funded training programmes which include post graduate degrees and by providing them with opportunities to work on a wide range of interesting projects.
- We are proud of our high staff retention rate which in 2009 was 100%
- We are accustomed to the demands of working within various UK, European and international regulatory regimes.
- We value practical experience and a number of our consultants are drawn from operational roles in high hazard industries.



Applied Skills

Safety Engineering

- Hazard Identification and Assessment:
 - HAZID
 - HAZOP
 - Safety Integrity Level (SIL) Determination
 - Bowtie Assessment
- Quantitative Risk Assessment
- Major Hazard Studies:
 - Fire and Explosion Risk Analysis
 - Evacuation, Escape and Rescue Analysis
 - Dropped Object Study
 - Collision Risk Analysis
- ALARP Demonstration
- Safety Case and COMAH Reports
- Safety Engineering in Design
- Loss Prevention Engineering
- Reliability Availability and Maintainability (RAM) Modelling
- Regulatory Compliance and Operational Safety

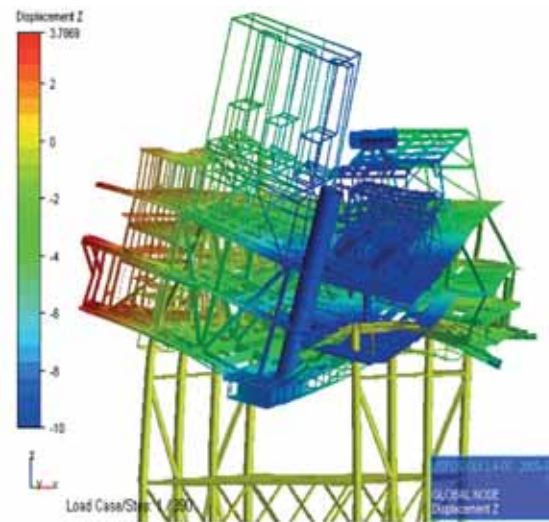
Risk Management

- Risk and HSE Management Systems Development
- Performance Measurement and Improvement
- Issues Management and Action Tracking
- Emergency and Contingency Planning
- Incident/accident Investigation



Engineering Mechanics

- Exhaust Gas Dispersion
- Helideck Wind Environments
- Natural and Forced Ventilation Efficiency
- Fire Consequence Modelling
- Explosion Modelling
- Wind Force on Installations and Substructures
- Structural Response to Accidental Events
- Post Accident Residual Strength Assessment



Assurance and Verification

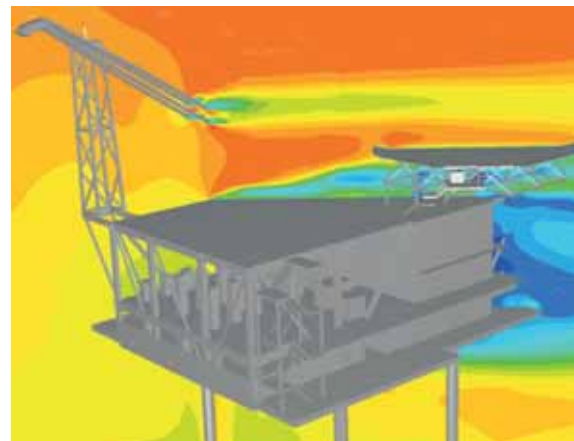
- Identification of Safety Critical Elements
- Performance Standards
- Written Schemes of Verification
- Safety and Environmental Management System Auditing
- Engineering Substantiation
- Condition Assessment and Survey
- Incident Investigation and Analysis
- Independent Peer Review (IPR)
- Project Audit and Design Review

Human Factors

- Equipment, Control Room and Workstation Interface Design
- Error Identification and Reduction (Task Analysis, HEART, THERP etc)
- Safety Culture Assessment and Improvement
- Workload Assessment and Job Design
- Organisational Design
- Training Needs Analysis
- Competency Management
- Procedure Design and Assessment

Environmental Management

- Environmental Impact Assessment (EIA)
- Contingency Planning
- Environmental Management Systems
- Permits and Consents
- Emissions Monitoring
- Environmental Management System Auditing



Proven Capability

ARC carries out work for upstream and downstream oil and gas companies, process and chemical manufacturers, engineering contractors and regulatory bodies in the UK and around the world. Some of our oil and gas main clients are:

| | | |
|--|--------------------------|----------------|
| AGIP | Exterran UK | Saipem |
| Aibel | Exxon | SBM |
| Amec | Fluor | Shell |
| BHP Billiton | Gusto MSC | Swift Drilling |
| Bluewater | Hyundai Heavy Industries | Technip |
| BG | INEOS | Tullow Oil |
| BP | Linde Engineering | Total |
| CB & I | Nexen | UK HSE |
| Chevron | Petrofac | Wood Group |
| Costain | PSN | Workfox |
| Daewoo Shipbuilding & Marine Engineering | Pencol/Penspen | Worley Parsons |



Cross-section of Project Profiles

Total E&P Netherlands:

ARC has carried out all safety engineering activities for Total Netherlands for the last 8 years including development of technical workbook carrying out HAZID, HAZOP, SIL Assessments, Site Audits, Major Hazard Studies, Quantitative Risk Assessments, CFD Gas Dispersion and Explosion Studies, Gap Analyses and Safety Cases for over 18 gas platforms .

Daewoo Shipbuilding & Marine Engineering:

CLOV FPSO: HAZID, HAZOP, LOPA, Gas Dispersion and Explosion Analysis, Exhaust and Vent Study, Fire Risk Assessment, Ship Collision, Dropped Objects, Evacuation Escape and Rescue Analysis, Quantitative Risk Assessment, Structural Redundancy Analysis, RAM Modelling and Ergonomics Review.

BP Grangemouth:

HAZOP/LOPA and QRA for the refinery. The studies took 12 months to complete and used Cirrus for Consequence Modelling and BPMark for the QRA. Other related work included Human Factors Engineering, Safety Culture Surveys, Action Tracking and Close Out, and Management System Reviews.

SBM, Frade FPSO:

ARC modelled 3D fire scenarios using FLUENT to predict impinging structural members and hence determine the amount of passive fire protection (PFP) required on a risk basis.

Hyundai Heavy Industries OFON2 Project:

ARC carried out all Safety Studies during detailed design of the OFP2 Production Platform. The work included: HAZID, HAZOP, SIL, Fire and Explosion Risk Assessment, Dropped Object Study, Performance Standards, Structural Redundancy Analysis, PFP Optimisation and Quantitative Risk Assessment.

Total E&P Myanmar:

Detailed Quantitative Risk Assessments for the offshore Yadana Complex and onshore pipelines.

Chevron UK:

Safety engineering support over the last 4 years, carrying out Site Audits, Hazardous Area Classification, Gas Dispersion and Ventilation Assessments, Fire and Explosion Modelling.

BHP Billiton:

Gap Analysis of SIL procedures and practices; development of a SIL Procedures document to support compliance with best practice.

Shell Okoloma Gas Plant:

Development of Design and Operations HSE Cases, including performance.

Shell Koula – Permanent Production Facility, Gabon:

Support to the engineering contractor, Exterran UK, carrying out RAM Analysis, Safety Critical Elements and Performance Standards, Design and Operations HSE Case, Verification of Safety Critical Elements.

Linde Engineering, Borouge Project:

Detailed design safety engineering support for the Borouge Ethylene Plant in Abu Dhabi. Activities included HAZOP, SAFAN, FIREPRAN, Fire Risk Analysis and QRA.

Exxon Refinery, Rotterdam:

Quantitative Risk Assessment and Safety Report for the refinery. Modelling carried out using SAFETI software. Subsequently ARC has been involved in preparing explosion prevention documents in accordance with Atex regulations.

“The majority of ARC’s work is repeat business”

Case study: Developing the Safety Case for Offshore Drilling in the North Sea

Swift Drilling BV has big plans for the small oil fields of the North Sea. The company has developed a high tech offshore drilling installation which will open up fresh prospects for fields that previously appeared unattractive because of the difficulties in extracting gas from them.

Swift Drilling has developed a custom-made jackup drilling platform that can be operated safely in the harsh conditions of the Southern North Sea (SNS). The significantly lower drilling costs of the smaller and modern drilling platform makes it profitable to develop the smaller gas and oil fields.

The platform is an ABS Class A1 self-elevating drilling rig, 67m x 40m x 5.5m in length, breadth and depth. The rig is built to an MSC design, which features four 92-metre-long legs. It can operate in water depths to 45m, which covers most of the SNS. The design also accounts for the year-round weather conditions and can accommodate 66 people.

ARC consultants prepared and submitted a Safety Case for the HSE in the UK and the equivalent, a Safety and Health Document, for the Dutch State Supervision of Mines so that the platform could operate in United Kingdom and Dutch waters. Swift's light offshore drilling unit is of particular interest to the governments in both the Netherlands and UK who are seeking to maximize development of remaining reserves.

Swift Drilling awarded the contract to ARC because of our extensive experience in this area and our ability to offer a programme which tied in with the construction and operational deadlines.



“Unless the regulatory demands placed on clients in safety submissions are fully appreciated, this can cost them dearly in retro-fits and delays in programme start. ARC’s experienced team can guide, advise and successfully deliver a compliant case on time, and to budget.”

Robin Peart, Director
Abbott Risk Consulting

Case study: Managing Risk for Total's Egina Oil Production Facility, Nigeria

The Egina installation, located 150 Km off the coast of the Niger Delta, is the third deep offshore development for oil producers Total Exploration and Production Nigeria. The oil field is expected to go into production in 2013.

The subsea infrastructures, which transport the hydrocarbon effluents, consist of several kilometres of a complex array of high pressure-high temperature subsea flowlines connected by pipe sections to a Floating Production Storage and Offloading vessel (FPSO).

The 330m long FPSO houses the surface treatment facilities and is designed to receive oil and gas produced by the Egina field, process up to 180,000 barrels of oil per day and store millions of barrels until they can be exported through a single point mooring oil terminal. Gas is exported

via the Amenam platform for onward delivery to a processing plant. Accommodation suitable for up to 240 people is also provided on the FPSO.

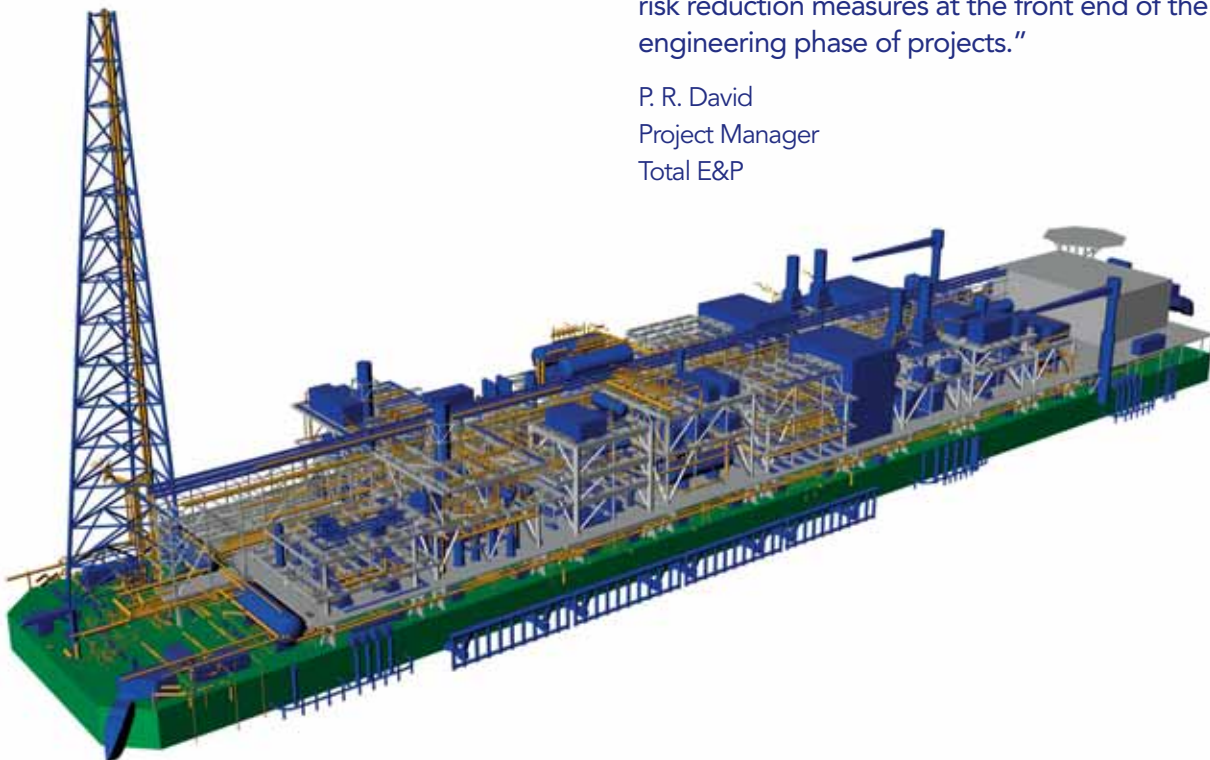
ARC has been working on the project since 2008, carrying out a number of safety engineering and risk analysis studies throughout the concept and basic engineering project phases.

Responsibilities include completion of the Fire Risk Analysis, Explosion Modelling, Gas Dispersion Modelling, Quantitative Risk Assessment and a range of other studies with the objective of concluding a number of design options.

ARC has significant influence on the design and layout of the facility, demonstrating that risks associated with operation of the facility are as low as reasonably practicable.

"ARC is a major provider of safety engineering and risk evaluation services to Total E&P. ARC has always provided a flexible and responsive service to help us identify major safety and risk reduction measures at the front end of the engineering phase of projects."

P. R. David
Project Manager
Total E&P



What our clients say:

"ARC has provided an excellent level of safety engineering consultancy, with flexibility, which enabled our department to continue to provide sound technical support to our offshore operations."

Peter Main, HSEQ Manager, Bluewater

"ARC is one of our main suppliers for external consulting services for safety/ risk studies and consequence modelling. We appreciate the high qualification, motivation and reliability of ARC consultants."

Dr. Stefan Rath, HSE Management & Risk Studies, LINDE AG

"ARC has been associated with the OFON Project since 2004 and have been the solely responsible Risk Consultant for carrying out Fire Explosion Risk Assessments, Marine and Offshore Safety Studies, and preparation of the Operational Safety Case. We have always found ARC to be reliable, helpful, communicative, and having have a flexible approach. I would have no hesitation in recommending them to future clients."

Larry Otten, Project HSE Manager, TOTAL, Paris.

Abbott Risk Consulting is proud to be voted one of The Sunday Times Best 100 small companies





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