

Profile

A Professional Process Safety Engineer, Chartered Engineer, Scientist and Mathematician with over 35 years' experience in risk, safety, environmental and engineering consultancy.

Project Experience

Process Safety Management and Human Factors

Reviews Health & Safety Policy, Procedures and arrangements particularly where the risk of major accidents, including MATTEs, is present (eg Oil, Gas, Chemical, Offshore, Railways and Nuclear installations) or other unusual hazards and risks may occur (e.g. fire fighters). Advises on COMAH / Offshore Safety Case requirements and other "permissioning" regimes and general duties under them, including Safety Report / Case preparation.

Experience of problems with Safety Management and the Human Factors involved for staff trying to prevent or control abnormal situations arises from involvement in major accident, and other incident investigations arising from refineries, gas terminals, offshore platforms, steel works, and railways.

Has led teams developing techniques for assessing safety culture within organisations such as a railway maintenance contractor and a group of process industries where workforce involvement was identified as a major factor.

Responsible for the team developing human factors tools such as the Entec/HSE methods for:

- assessment of the safety of staffing arrangements in the process industries; and
- assessment of the delivery of supervision in the process industries.

His team developed the Safety Case Template for the International Association of Drilling Contractors following Lord Cullen's recommendations.

Incident Investigation and Emergency Response

Guidance on First Response to Loss of Containment Incidents in the Oil & Gas Industry for Energy Institute, London 2015/16.

Expert Opinion on 2005 Gas Explosion in Scotland for lawyers on behalf of the operator's insurers (Confidential).

Expert Witness reports and oral evidence to Ladbroke Grove Rail Inquiry on Safety Case Regime, Safety Management System, Group Standards and Accident Investigation. (For HSE/Inquiry Secretariat)

Expert Witness reports and advice to Texaco following 1994 PCC (Fluid Catalytic Cracker) incident and subsequent HSE prosecution; including investigation of root causes of the accident (management systems, human behaviour and equipment failures) and development of mitigation arguments advanced in Court.

Assistance on specialised subjects to project team involved with Perrier SA following contamination.

Provided support to major accident inquiry teams on Ladbroke Grove

Last Updated February 2016

Academic Qualifications

University of Oxford
Mathematics MA Hons
Corpus Christi College 1968 -1971

Brunel University
Numerical Analysis MSc
Part Time 1974 – 1978
Examination and Dissertation:
"Numerical Methods for Simulation of
Water Table Levels"

Professional Memberships etc

**FICHEM Professional Process
Safety Engineer**

FIMA, CMATH,

MIGEM

Engineering Council C Eng

FEANI European Engineer

**ICHEM Safety and Environment
Professional**

Professional Training

CDipAF

Management Training

Various CPD activities

Previous Employers

Entec UK Limited

Cremer & Warner

Hydraulics Research Station

Imperial College

Software Summary

NB Programmer & User since 1966

- ▶ Windows/Office/etc
- ▶ Fortran/Algol/.....
- ▶ Phast, Fault Tree Plus, PHAWorks

Contact Details

Astrid Consulting
READING, UK

✉ peter@astriduk.co.uk

☎ 0118 946 2557

📞 0771 888 2117

Rail accident, Kings Cross Fire and Piper Alpha for UK Government.

Analysis of accidents and remedial measures at steelworks for BHP in Australia on two separate occasions following thermal radiation and explosion incidents with multiple fatalities.

Investigation and analysis of refinery incidents including Pembroke Cracking Company (1992 and 2001) and Total Le Havre (Vacuum Distillation Column), 1995 – 1997, BP Grangemouth Hydrocracker, 1987.

Advice on safety & environmental requirements for bulk liquid storage facilities. then conceptual layout and site selection for new facilities and risk assessment of transport following the major incident at Coode Island in Victoria, Australia.

Accident Investigation follow-up advice to lawyers on major incidents at two gas plants in Australia.

Investigation of Railway Accident Investigations and the conclusions / recommendations made with a view to improving the analysis and giving better advice on mitigation / accident prevention.

Review of expert's report on fatalities during the Jim Clark Rally in 2014 for Crown Office, Scotland

Health and Safety Advice

Member of team advising Irish Government on the design of a new upstream Petroleum Safety Framework, based on Safety Cases and a risk based permissioning regime. (CER Ireland)

Contract research projects for the Health and Safety Executive including Assessment of Safe Staffing levels in the Process Industries with particular reference to Control Rooms and related operations; and Assessment of the delivery of Supervision in the process industries.

Advice on Safety Management System as part of an integrated Health, Safety, Environment and Quality Management System to a European Gas Utility. Specific advice, including defining the scope and drafting procedures for the aspects of the system addressing major accident hazards.

Manning levels for emergency operations at a Brazilian Refinery and marine terminal, Petrobras.

Reviews of aspects of health and safety management, including management of emergencies, qualification and training of management and staff, arrangements to ensure safe operations and the means taken to ensure that the safety risks are as low as reasonably practicable.

Advice and training on Safety and Risk Management for the London Fire & Civil Defence Authority

Advice to the World Bank on their Guidelines for Control of Industrial Major Accident Hazards.

Operator Exposure Study for pesticide coatings to satisfy HSE and USEPA requirements.

Hazard Identification and Quantified Risk Analysis

A Risk Management Specialist with experience of risk assessment and its interpretation in many applications. Since joining Entec (formerly Cremer & Warner) he has worked on the hazard analysis of refineries, petrochemical, chemical, explosives, LNG, LPG and gas processing installations, and undertaken research into dispersion of vapour from LNG spills. Carried out quantified risk analysis studies and environmental impact assessment for pipelines, oil, gas, chemical and nuclear plant. Also appeared as an expert witness at Public Planning Inquiries (concerning development of, or near to, major accident hazards) and written expert witness reports for use in litigation and Public Inquiries relating to major accidents, including the 1994 Pembroke Cracker Explosion and Ladbroke Grove Rail Inquiry. Recent work has focussed on Human Factors, Safety Management and Regulatory Controls with particular interest in Integrating Safety Quality and Environmental Management Systems.

Led the development of a wide range of techniques for use in safety assessment within the process industries including mathematical consequence model development and quantified risk assessment tools.

Personal experience of the whole range of techniques employed, including HAZID / HAZOP leader, consequence modelling, fault and event tree analysis (bow ties), FMEA, SIL analysis, QRA and making deductions/judgements/recommendations based on analysis. These have been used in the preparation of all or sections of Safety Reports or Safety Cases. Also Project Manager / Director of projects in these areas.

Risk Management

Development of Corporate Risk Model for UK utilities group with associated companies, totalling 13 separate entities covering financial, regulatory, organisational, technical, health safety and environmental risks for each company. Model satisfied UK Corporate Governance requirements and was highly rated by auditors.

Project Director for development of risk based resource allocation method for UK Fire and Rescue Service followed by development of model to assess the economic cost of fire in England and later Wales.

Led team developing project risk model for offshore contractor, allowing amalgamation of risk from projects.

Acted as risk manager for major, critical UKCS project that could disrupt over 20% UK Oil & Gas production.

Technical Investigations and Advice (including Peer Review and Technical Assurance)

Peter has a particular skill and interest in using his knowledge to solve difficult technical problems whilst maintaining or improving safety standards. In some cases, he has presented clients with arguments that clients have used to convince regulatory authorities that an unconventional option is the "best" solution. Particular examples include:

- ▶ Designed and implemented a risk management process for projects on behalf of a North Sea Operator.
- ▶ Reviewed SEPIL's Corrib plan of development and submissions to DCENR, Ireland and advised the Minister on consent and suitable conditions for the project to proceed. Monitoring compliance.
- ▶ LNG Import Terminal – spill control measures improved following insufficient weight allowance in jetty support for pipelines.
- ▶ Offshore Gas Production – produced a risk assessment argument for use of existing riser with design pressure below well head shut-in pressure but with a high integrity pressure protection system.
- ▶ Demonstration of best environmental option and safety risk ALARP for major UK onshore/offshore project. Provided Peer Review & Assurance of Safety, Environmental and Technical Issues.
- ▶ Environmental Risks from Chemicals and Wastes at proposed Coronation Hill Gold Mine, Kakadu, Northern Territory, Australia for the Commonwealth Resource Commission
- ▶ Investigation of reliability and availability issues on a sub-sea isolation valve on pipeline T.
- ▶ Review of the use of QRA and on Kashagan major sour gas project in Kazakhstan. Gave expert opinion on the use of risk assessment at early stages of the project (Evaluation and Concept Selection) and the use that could have been made of QRA during FEED prior to Project Sanction. Also examined assumptions and data used during the risk assessment process.

Expert Witness Safety and Land Use Planning near Major Hazards

In addition to his expert witness work for major accident inquiries and litigation Peter has also given oral and written evidence to many public inquiries or planning authorities including:

Development of Planning Guidance for regeneration of sites throughout the UK in areas affected by hazards from gasholders and high pressure gas pipelines under the HSE PADHI Guidance (Various Developers, London Thames Gateway Development Corporation and London Development Agency).

McQuillan Envirocare v Antrim Borough Council: Expert witness on behalf of the Council regarding risks to public health from hazardous waste. 2010.

Corrib Gas Onshore Pipeline, Oral Hearing by An Bord Pleanála, 2010 (Belmullet, Co Mayo) Evidence on behalf of Department of Communications, Energy and Natural Resources, Ireland.

Mossel Bay, South Africa 2009: Tank Storage adjacent to Commercial and Retail Development 2010, Report Gas (LPG) Explosion in Scotland (2005)

Lockerley AGI, Hampshire UK, Natural Gas, National Transmission System Compressor Station, Report and Evidence on behalf of Transco (National Grid).

Mere Tank Farm, Portland, Dorset, UK. Fuel Storage adjacent to Sailing Academy, Reports, Expert Witness and ultimate resolution of difficulties arising from subdivision of former Royal Navy facilities and inadequate separation of leisure use and hydrocarbon liquid bulk tanks. Followed by Safety Report preparation and annual audits of the tank farm for Portland Port. (2000-2007)

Coryton Refinery and proposed new town on Canvey Island. UK. 1990. Report and Evidence to Public Inquiry on Safety for Mobil Oil as owners of the Refinery and objectors to the development.

LPG Depot, Co Durham, UK 1984 Report and Evidence to Public Inquiry on the Safety of proposed LPG depot on ex-coliery land.

Training Courses and Seminars Delivered

Organised (delivered about 30%) six week course on Hazard Analysis and Risk Assessment – originally commissioned by Engineers India Limited.

Process Safety Awareness Training – 1 day course commissioned by BG plc

London Fire & Civil Defence Authority 3 day courses in Risk Management and Risk Assessment

Anticipation and Prevention of Major Accidents. Seminar for World Bank, 1985, & EPA, OSHA and in UK.

Life Cycle QRA Presented at 8th Annual European Summer School on Major Hazards, 13th-17th September 1993, Christ's College, Cambridge.

Assessing the Safety of Staffing Arrangements for Process Operations in the Chemical and Allied Industries organised by the Chemical Industries Association.

Supervision Safety Assessment Principles in Supervision Seminar for UK Health & Safety Executive

Major Accidents – Lessons from the Past presented to IGEM AGM and BCECA Safety Advisers, 2013

Major Accident Consequence Modelling for Institution of Chemical Engineers 2016

Plant and Equipment:

Peter's experience covers a wide range of oil, gas, chemical and other facilities including:

Offshore Drilling (MODUs)	Offshore (Oil & Gas) Platforms
Sub-sea production	Offshore Pipelines (Oil & Gas)
Onshore Pipelines – Gas Oil LPG Ethylene CO ₂ Chlorine	Gas Plants (fractionation, sweetening, conditioning, etc)
LNG Liquefaction, Storage, Regasification, Peak Shaving	LPG – Oil separation, storage and export
Refineries and bulk liquids storage	Bulk Liquids Storage
Gasification and power generation	Ethylene, Propylene
Ammonia, Chlorine, Sodium Cyanide	Titanium Dioxide
Ethylene Oxide	Gold Mining & Processing
Innovative hydrogen storage	Pre-combustion CCS
Railways	Nuclear
Steel	Fire and Rescue Service

Research Experience:

- ▶ Investigated Atmospheric Lee Waves at Imperial College 1971-1974
- ▶ Modelling salt water intrusion in estuaries (salt / fresh water mixing or dispersion) 1974 - 1981
- ▶ Investigated salinisation of soils in irrigated land and the influence of water table depth / drainage, developing finite element models of flow in porous media and water table movement. 1978 -1981. (Wrote own finite element package).

- ▶ Developed mathematical models of dispersion of dense gas vapour clouds, such as those arising from spills of LNG in a joint development between Cremer & Warner and British Gas Corporation, 1981 – 1986. Also other consequence models and risk assessment programs – converting models from main frame computers to early PCs and writing own software to replace maths library routines (Runge Kutta and Finite Difference solutions).

Employment History

2010 – Present	Astrid Consulting, Proprietor & Principal Consultant
1993 – 2010	Entec UK Ltd. Technical Director
1981 – 1993	Cremer & Warner, Senior Scientist to Director
1974 – 1981	Hydraulics Research, Higher Scientific Officer to Senior Scientific Officer
1971 – 1974	Imperial College, Research Assistant & Demonstrator

Clients (including Clients during previous Employment)

Oil & Gas	Chemical	Public – International, National, Local
Agip	Cristal (SCM)	Commission for Energy Regulation (Ireland)
Amerada Hess	Exxon Chemical	Commonwealth Resource Commission (Australia)
Amoco	FACT	Crown Office, Scotland
Apache North Sea	ICI	Department of Communications, Energy and Natural Resources (Ireland)
BG	IPCL	Department of Environment (Denmark)
BGE	NuFarm	Department of Mines (South Australia)
BHP	Rohm & Haas	Government of Victoria, Australia
BP	SembCor	Health & Safety Executive (Research Contracts)
Calor	Union Carbide	Home Office
Centrica	WesFarmers	Ladbroke Grove Rail Inquiry
CLH Pipeline Sys.		London Development Agency
Conoco	Energy	London Fire and Civil Defence Authority
DEPA (Greece)	Coal Research Establishment	London Thames Gateway Development Corporation
Distrigas	Energy Institute	States of Jersey
ENI	National Grid	World Bank
ExxonMobil	Progressive Energy	
KazMuniGaz	RWE npower	
Marathon		Consultants / Lawyers
Mobil	Design Contractors	Altor Risk Group / Stirling Group/ Restrata
Petrobras	Bechtel	Amec Foster Wheeler (E&I) / Entec
Portland Bunkers	Costain	AT Kearney
Repsol	Davy	Charles Taylor Adjusting
Shell	Engineers India	G3baxi
Statoil	Fluor	GL Nobel Denton
Sun	Kellogg (KBR)	HBM Sayers
Texaco	PBG (Poland)	Johns Associates
Topaz	Petrofac	Lovell
Total	R M Parsons (Worley Parsons)	ORC International
	Sener	Ramboll Environ
Other Industries	SNC Lavalin	Slaughter & May
B&Q / Wincanton	Tractebel / TGE	
Barratt Homes	Whessoe	
BHP Steel		Other
Bloor Homes		Institution of Chemical Engineers
Manchester Ship		Various Solicitors and Planning Consultants
Canal Co		(England, Wales, Scotland, Australia, S Africa)
Story Construction		
Network Rail		