

Ivan M. Vince
Principal Consultant

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Qualifications Sydney University, BSc (Biochemistry, Pharmacology)
Sheffield University, MSc (Combustion Science and
Pollution Control; course and thesis 'Relationship between
NO_x formation and temperature fluctuations in an enclosed
flame')
PhD Sheffield University (on Styring Scholarship) 'Nitric
Oxide Formation in Flames'

Affiliations Chartered Chemist
Member of Royal Society of Chemistry
Fellow of the Institute of Energy
Member of the Combustion Institute
Environmental Law Foundation
Member Institute of Petroleum
European Association for the Science of Air Pollution
Institution of Chemical Engineers (Environmental
Protection Bulletin)
National Society for Clean Air & Environmental Protection

Date of Birth 16 May, 1948

Nationality British

Current Position at CWA

Since 1982, Ivan has been closely associated with CWA as a specialist applied science consultant, with extensive experience in risk and safety studies and marine casualty investigation. He has undertaken numerous assignments including fire and explosion investigation, risk and safety studies, forensic investigation of cargo contamination incidents, quantitative risk assessment, air pollution studies and other forms of environmental impact.

Specific Expertise and Experience

Ivan possesses extensive experience in the application of the various techniques available for fire/explosion investigations, hazards analysis and risk assessment. These include state of the art methodologies for:

- Loss and contamination of bulk cargoes
- Consequence analysis for fire and explosion damage
- Dispersion (including dense gas) computations for toxic release
- Reliability studies
- Failure frequency assessment
- Quantitative risk profiling
- Hazardous waste disposal
- Hazards identification, screening and ranking

He has also been involved extensively in software development, including cargo quantity reconciliation package 'CAROL'; analysis and computation of cargo loss factors; unsteady conductive and convective heat transfer/ROB formation/flash-point depression by trace contaminants; evaporative loss; simulated weathering of LPG; flames properties; liquid pool fires; fires in partially open tanks. He has also conducted significant research into industrial hygiene.

Ivan is thoroughly conversant with HSE planning criteria for developments in the vicinity of high hazard plant and is presently involved in writing a COMAH safety report for a major oil company with regard to a new terminal facility in the UK.

Specific Experience at CWA

The following is not intended to be an exhaustive list, rather its purpose is to indicate the broad scope of Ivan's experience from projects handled over the past few years at CWA.

- Development of toxic gas dispersion model to assess on-site risk for World Bank sponsored ISAS (Integrated Safety Audit System).
- Investigation of near disastrous runaway reaction (acetaldehyde polymerisation catalysed by acid contaminant, onboard vessel owned by Neste Oy), with detailed physicochemical modelling, leading to precise identification of cause.
- Detailed investigation and mathematical modelling of vapour phase contamination during carriage of co-cargoes/petroleum products with different volatilities.
- Extensive research into contamination incidents related to the presence of sulphur species in the carriage of refrigerated LPG cargoes.
- Experienced Expert Witness

Projects include:

- Investigation of fire, explosion and pollution aspects of one of the largest oil tanker casualties, including detailed modelling of:
 - burning spill on sea;
 - fire in partially intact tanks;
 - spreading of unburned oil on sea;
 - release of oil below water
- Study of evaporative loss and cross-contamination from volatile cargoes in transit; appeared as expert witness on this subject at commercial arbitrations in London and New York.
- Development of computerised simulation of weathering of crude oil and petroleum products.
- Advice regarding safety of proposed inerting of vessel's non-cargo spaces containing explosive mixture.
- Development of CAROL (Control and Reconcile Oil Losses), a computer program commercially available for auditing custody transfer.
- Co-inventor of a patented device for taking representative samples from stratified crude oil.
- Co-author of International Oil Insurers' EML (Estimated Maximum Loss) guidelines for assessment of fire and explosion hazards. Both the IOI Guidelines and associated software are commercially available.
- Investigation of many contaminated cargo claims, appearing as expert witness in arbitration and court hearings.
- Theoretical treatment of diurnal "breathing" emissions from storage tanks and cargo vessels with volatile contents (New York arbitration).

Summary of Previous Employment

Since 1988, Ivan has been actively involved in the provision of environmental technology transfer to Hungary and is a Visiting Fellow at:

- University of Surrey, European Institute of Health & Medical Sciences
- University of Greenwich, School of Chemical & Life Sciences
- Loughborough University of Technology, Centre for Hazard & Risk Management
- Member, Governing Body & Audit Panel, AOQC Moody International
- Member, Environmental Advisory Board, Kenal Services Ltd

1978-1984

Imperial College, Chemical Engineering Dept.
Post Doctoral Research Fellow

Research on plasma-jet ignition to minimise pollution and improve efficiency of internal combustion engines (funded in turn by Lucas Industries at SERC).

1979-1982

Watt Committee on Energy
Consultant

Various consulting assignments, principally on combustion related matters.

1978

Chelsea College/UNEP Research Centre
Research Assistant, Monitoring and Assessment

1977-1979

Open University
Course Tutor, Environmental Control and Public Health, Post-Experience Course.

1977-1978

Pergamon Press
Assistant Editor, Progress in Energy and Combustion Science.

1972-1973

Commonwealth Agricultural Bureaux
Edinburgh
Scientific Information Officer

Previous Combustion Research

Ten years (Sheffield University and Imperial College) of full-time research on combustion generated air pollution and flammability limits.

Publications

The following is a selection from Ivan's extensive list of titles. A full list of publications is available on request.

Hayhurst AN, Vince IM (1977), Production of 'Prompt' Nitric Oxide and Decomposition of Hydrocarbons in Flames, *Nature*, 266, 524.

Vince IM, Vovelle C, Weinberg FJ (1984), The Effect of Plasma Jet Ignition on Flame Propagation and Sooting at the Rich Limit of Flammability, *Combustion and Flame*, 56, 105.

Tomi DT, Vince IM, Matheussen D, Bishop R (1992), EML – Estimated Maximum Loss from Explosion and/or Fire: Guidelines for Assessment in the Oil, Gas and Petrochemical Industries (London: International Oil Insurers).

Nixon W, Bottelberghs PH, Vince I et al (1995), Environmental Risk Criteria for Accidents: a Discussion Document, European Commission (DG XII) Contract No. ERBEV5VCT940417.

Vince I (1999), A Pilot Information System on Environmentally Hazardous Activities (Institutional Strengthening of the Ukraine State Environmental Inspectorate), European Commission (TACIS, DG IA) Project No. ENVUK9701, 97-0728/00.

