



PROCESS SAFETY AND ENVIRONMENTAL PROTECTION

Publication of the [Institution of Chemical Engineers](#)

AUTHOR INFORMATION PACK

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DESCRIPTION

PSEP aims to be the principal international journal for publication of high quality, original papers in the branches of engineering concerned with the **safety of industrial processes** and the protection of the **environment**.

Papers that deal with new developments in safety or environmental aspects, demonstrating how research results can be used in **process engineering design and practice**, are particularly encouraged. Experimental or theoretical research work bringing new perspectives to established principles, highlighting unsolved problems or indicating directions for future research will also be considered. The journal is especially interested in contributions that extend the boundaries of traditional engineering as well as in multidisciplinary papers.

Papers related to environmental protection must take an integrated pollution control approach, demonstrating clearly that any proposed treatment method does not simply transfer pollution from one environmental medium to another, for example, from air to water or from water to solid waste. All such papers must discuss how any treatment effluents, spent adsorbents, etc., can be treated or disposed of safely, avoiding transfer of pollution to another environmental medium.

For environmental protection, papers that are outside the scope are those that lack engineering aspects, including those that: use experimental techniques primarily to prepare and/or characterise various materials without considerations of process engineering design and practice; present primarily laboratory experiments of the effects of different parameters on behaviour of materials and pollutants (e.g. pH, temperature, mass of adsorbent, etc.) without further insights into the implications for engineering design and practice; focus primarily on adsorption models and curve fitting (e.g. Freundlich, Langmuir etc.); and contain only chemical, physical and/or thermodynamic analyses.

Core topic areas:

Risk Assessment and Reliability Engineering

- Risk assessment, risk management, consequence analysis, and uncertainty quantification.
- Supply chain risk management.
- Cyber and physical security vulnerability assessment.
- Risk assessment of hydrogen-based technologies.
- Human reliability analysis (HRA) and human-machine interface (HMI).
- Reliability predictions of integrated systems and high-temperature power electronics.

- Integrity management and reliability, availability and maintainability (RAM).

Technical Safety and Loss Prevention

- Fire and gas detection.
- Firewater systems.
- Functional safety and safety integrity levels (SIL)
- Layer of protection analysis (LOPA)
- Bowtie analysis.
- Emergency response
- HAZOP and other hazard/risk identification techniques.

Modelling

- Modelling liquid, gaseous, and two-phase releases and dispersion.
- Consequence modelling, including: fire, explosion, toxic, eco-toxic effects and projectile impacts.
- Methods, including computational fluid dynamics (CFD).
- Accident investigation and modelling.

Chemical Toxicity and Exposure Assessment

- Toxic releases and exposure assessment.
- Process plant health issues.

Process Pipelines, Storage and Security

- Process pipelines security and terrorism.
- Pipeline leak detection and measurement and corrosion assessment.
- Carbon capture and storage (CCS) and CO₂ transport.

Fire and Explosion

- Fire, combustion, and explosion phenomena.
- Dust explosions.
- Fire and blast protection and survivability.

Human Factors in Design and Management

- HSE performance measurement including leading and lagging indicators.
- Human and organizational factors in safety cases.
- Human performance optimization by design.
- SIMOPS (simultaneous operations).
- Situational awareness.
- Communications and risk control systems.
- Resilience engineering.
- Technical assurance and workforce training.

Inherent Safety and Inherently Safer Design• Hazard identification

- Design and development of new processes and equipment.
- Methodologies for ranking inherent safety.
- Retrofitting inherently safer solutions and upgrading existing plant for improved safety.

Nuclear Safety

- Waste disposal.
- Design for decommissioning.
- Passively safe reactor designs.
- Nuclear reactor protective and monitoring systems.

Reaction Hazards

- Chemical thermal stability and thermal reaction hazards.
- Influence of impurities on reaction hazards.
- Development of reactivity hazard index ranking tools.
- Runaway reactions, including detection and mitigation.
- Compatibility/reactivity of chemicals involved in a chemical process.

Industrial Hazards and Safety Cases

- Major accident hazards
- ALARP and cost-benefit analysis.
- Industrial safety cases.

Incident investigations and case histories

- Case histories of incidents and lessons learned integration into design and operations.
- Technical analysis of incidents.
- Computational modelling to simulate actual incidents
- Use of incidents in training and improvement of safety performance
- Incident investigation methodologies
- Incident databases and their applications.

Air pollution prevention and treatment

- Methods and technologies for prevention and treatment of air pollution
- Air dispersion modelling
- Prediction and mitigation of air pollution incidents
- Health impacts from air pollution

Resource and waste management

- Recovery and recycling of materials and products
- Energy from waste and alternative resources
- Waste minimisation
- Waste treatment technologies
- Waste management: systems and processes for energy and material recovery and waste treatment; disposal
- Landfill and waste repository design, operation and management
- Land remediation and recovery

Water pollution prevention and treatment

- Industrial, pure and ultrapure water production
- Municipal and industrial effluent treatment
- Potable water treatment
- Sludge processing, energy recovery and disposal
- Mitigation of water pollution incidents
- Water pollution dispersion modelling
- Health impacts from water pollution

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INTRODUCTION

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