

<b>Job Title:</b>	Research Fellow A in CFD Analysis of Accidental Releases of Liquid Hydrogen and Ammonia
<b>Responsible to:</b>	Head of research group, or principal investigator
<b>Responsible for:</b>	Not applicable
<b>Job Summary and Purpose:</b>	
To undertake research in accordance with the specified research project(s) under the supervision of the principal investigator.	
<b>Main Responsibilities/Activities</b>	
<p>To undertake a range of research activities within a specified research area, assuming responsibility for specific areas of projects and making use of new research techniques and methods, in consultation with the research award holder or supervisor. This may include fieldwork, interviews, laboratory experimentation, critical evaluation and interpretation, computer-based data analysis and evaluation or library research.</p> <p>Using initiative and creativity to identify areas for research develop new research methods and extend the research portfolio. Analysing and interpreting results of own research. Write up results and prepare papers for submission to appropriate journals and conferences, and other outputs as required and/or appropriate. Attend appropriate conferences for the purpose of disseminating research results of personal development. The post holder may also contribute to writing bids for research grants and will contribute to collaborative decision making with colleagues in areas of research.</p> <p>Continually to update knowledge and develop skills, and translate knowledge of advances in the area into research activity.</p> <p>To plan and manage own research activity in collaboration with others. To carry out administrative tasks associated with specified research funding, for example risk assessment of research activities, organisation of project meetings and documentation. Implementation of procedures required to ensure accurate and timely formal reporting and financial control.</p> <p>To contribute to teaching in the Faculty by carrying out student supervision and/or demonstrating within the post holder's area of expertise and under the direct guidance of a member of departmental academic staff, as appropriate.</p> <p>The post holder may occasionally be required to supervise more junior research staff.</p>	

## Person Specification

### **The post holder must have:**

A doctoral degree in a relevant discipline (although individuals who have almost completed a doctoral degree may be appointed). Consideration may also be given to individuals who do not hold a doctoral degree but have required skills based on a number of years experience in specified / relevant fields

The post holder will have authority over some aspects of project work and must be capable of providing academic judgement, offering original and creative thoughts and be able to interpret and analyse results.

## Relationships and Contacts

Direct responsibility to the principal investigator or academic supervisor. The post holder may be asked to serve on a relevant Faculty committee. There may be additional reporting and liaison responsibilities to external funding bodies or sponsors. The post holder may work on original research tasks with colleagues in other institutions.

## Special Requirements

To be available to participate in fieldwork as required by the specified research project.

### **All staff are expected to:**

- Positively support equality of opportunity and equity of treatment to colleagues and students in accordance with the University of Surrey Equal Opportunities policy.
- Help maintain a safe working environment by:
  - Attending training in Health and Safety requirements as necessary, both on appointment and as changes in duties and techniques demand
  - Following local codes of safe working practices and the University of Surrey Health and Safety Policy
- Undertake such other duties within the scope of the post as may be requested by your Manager.

## Addendum

This document provides additional information relating to both specific aspects of the post/faculty and any post specific person specification criteria. The information contained within this document should always be read in conjunction with the accompanying generic Job Purpose.

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## Background Information/Relationships

THE FIRE AND EXPLOSION MODELLING GROUP (FEMG) is a multi-disciplinary research group specialising in the development and validation of consequence modelling tools to address cross cutting safety issues related to energy, transport and environment.

FEMG develops physics-based sub-models and modelling approaches to capture the underlying physics of complex safety problems. Most of the development has been conducted within the frame of open source computational fluid dynamics (CFD) code OpenFOAM® to facilitate model validation and application. Researchers apply fundamental combustion science to study a wide range of fire scenarios including liquid pool and gas burner fires, single and multi-phase jet fires, flame spread, façade fires and fires in enclosures as well as predictive tools for lithium-ion battery fires.

An important theme of FEMG's research is modelling safety related reactive flows relevant to the petrochemical industry for which she has received support from several international energy companies. Her research has encompassed fundamental characteristics of flame acceleration (FA) and deflagration to detonation transition (DDT), flame/detonation arresters, Micromist for explosion mitigation and confined/semi-confined gas explosions.

More recently, FEMG has also been engaging in ammonia safety modelling.

The postholder will plan and deliver research in accordance with the specified research project.

Direct responsibility to the principal investigator, who is also the line manager. There may be additional reporting and liaison responsibilities to external funding bodies or sponsors.

## Person Specification

This section describes the sum total of knowledge, experience & competence required by the post holder that is necessary for standard acceptable performance in carrying out this role. This is in addition to the criteria contained within the accompanying generic Job Purpose.

Qualifications and Professional Memberships	Essential/ Desirable
A doctoral degree in a relevant discipline (although individuals who have almost completed a doctoral degree may be appointed).	E
Experience in computational fluid dynamics (CFD)	E

Experience in OpenFOAM CFD code application	E
Experience in combustion	D
Experience in OpenFOAM development	D
Good publication records appropriate for the years of experience	E
Good teamworking spirit	D
Good communication skills verbally and in writing	E
<b>Key Responsibilities</b>	
<p>This document is not designed to be a list of all tasks undertaken but an outline record of any faculty/post specific responsibilities. This should be read in conjunction with those contained within the accompanying generic Job Purpose.</p> <ol style="list-style-type: none"> <li>1. Conduct CFD simulations of accidental releases of cryogenic liquid hydrogen, focusing on the evaporation and subsequent atmospheric dispersion as well as the consequence of potential ignition of the resulting cloud.</li> <li>2. Modify the in-house modified OpenFOAM code if deemed necessary to facilitate the study.</li> <li>3. Conduct CFD simulations of the atmospheric dispersion of ammonia following accidental releases.</li> <li>4. Modify OpenFOAM to address the <i>exothermic</i> chemical reactions between ammonia and water as well as the aerosol characteristics of ammonia cloud.</li> </ol>	
<b>N.B. The above list is not exhaustive.</b>	