UK Atomic Energy Authority

Application Pack

Senior Research Software Engineer

Vacancy Ref: **3666**

Table of Contents

UK Atomic Energy Authority

The UK Atomic Energy Authority (The Authority) is one of the world's leading research organisations supporting the development of fusion energy. Its primary mission is to advance fusion science and technology to the point of commercialisation of fusion energy and to position the UK such that it has a significant role in the fusion energy market. This is done through the Culham Centre for Fusion Energy (CCFE).

UKAEA has 1300 staff and agency supplied workers, including world-leading scientists and engineers, fostering close links with international partners, industry and academic institutions; it also supports the development of the Culham Science Centre and Harwell science, innovation, technology and business campus. It is a Non-Departmental Public Body sponsored by the Department for Business, Energy and Industrial Strategy (BEIS).

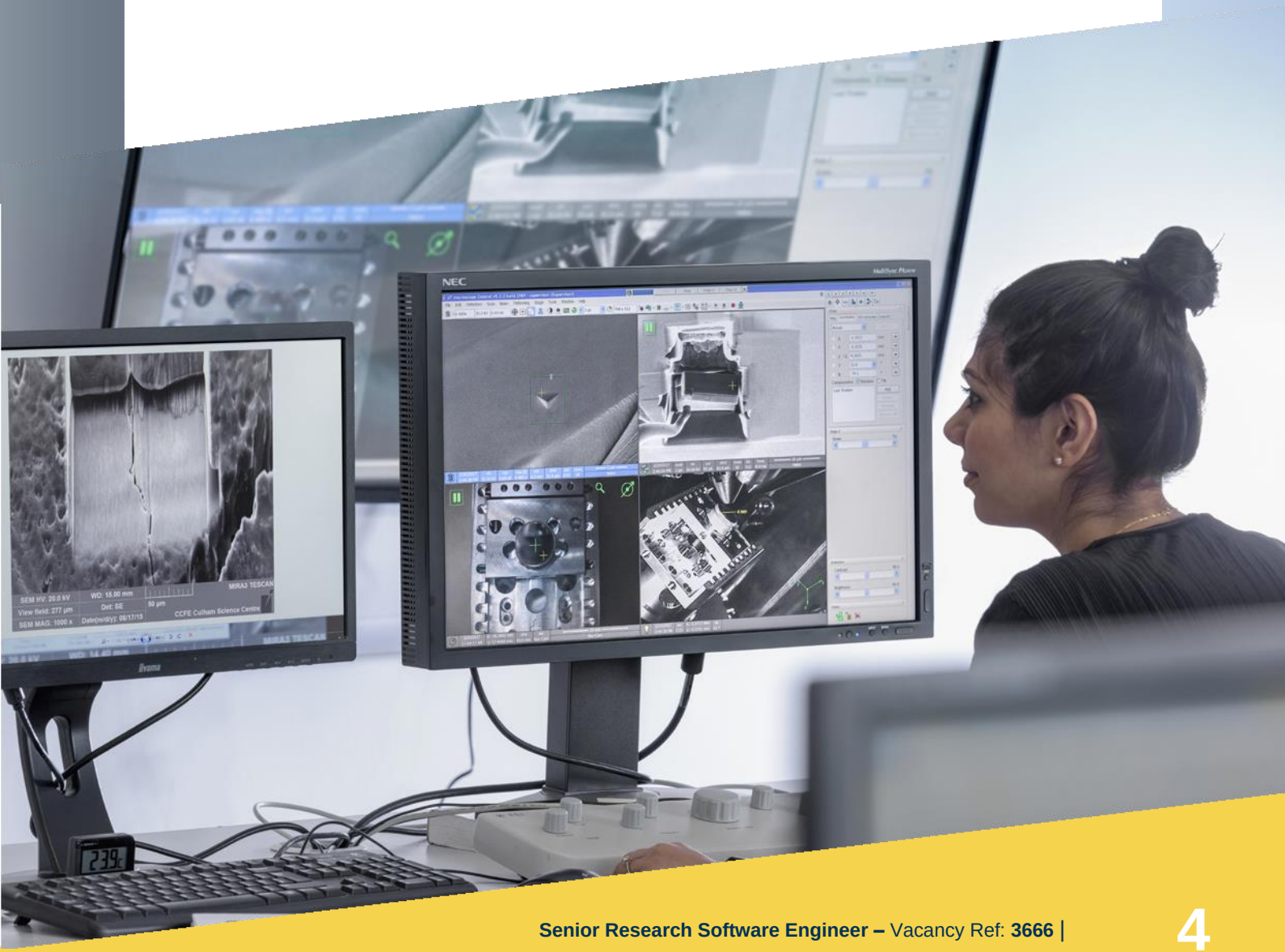
The activities of UKAEA include:

- operating the Joint European Torus (JET), Europe's premier fusion facility, under a contract with the European Commission;
- the UK fusion research programme, including a major upgrade to the Mega Amp Spherical Tokamak (MAST) device, funded by a grant from the Engineering and Physical Sciences Research Council (EPSRC);
- development of new facilities on the Culham site, such as RACE
- (Remote Applications in Challenging Environments), MRF (Materials Research Facility) FTF (Fusion Technology Facilities) and H3AT (Hydrogen-3 Advanced Technology) centres as well as various other to develop the technologies required for demonstration fusion reactors;

- ownership and management of the Culham Science Centre, freehold ownership of most of the Harwell campus and a share in the joint venture (with STFC and a private sector partner) to continue the development of the campus as a vibrant science, innovation, technology and business campus
- a business development programme, in both fusion and adjacent sectors such as materials, robotics, neutronics, component testing, tritium handling, advanced computing and modelling, as well as work for ITER (see below), and
- management of historic liabilities, and of the Authority's pension schemes.

ITER is a global scientific collaboration to prove the feasibility of energy from fusion on an industrial scale. Construction of the ITER facilities is underway at Cadarache in the south of France. Europe's ITER agency, Fusion for Energy, allocates grants and contracts to fusion laboratories and industry to complete the research and design for specialist ITER systems and construction of major components and UKAEA has been successful in winning a number of these grants or contracts or supporting UK industry to win contracts.

UKAEA manages an overall annual budget of around £115m, with income primarily received through Euratom, BEIS and EPSRC programme funding.



CODAS & IT Department

CODAS & IT (Control and Data Acquisition System and Information Technology) Department is responsible for the top-level (SCADA) software and hardware required for the Operation of JET, for the JET mass data store and for the CCFE-wide IT systems - office computing, site data networks and Linux computing clusters. It also has a growing role on the MAST-U experiment and supporting infrastructure. The department is made up of four Groups:

(1) Central Computing Group

The Central Computer Group is responsible for the centrally-managed IT Services and Infrastructure of the UKAEA site. This includes data networks, desktop computing, file-systems, UNIX, Linux and Windows server systems and JET data acquisition and storage tools. It also provides helpdesk support and operational management of UKAEA computer rooms.

(2) Control and Data Acquisition Systems Group

The Control and Data Acquisition Systems Group combines control and diagnostic activities with electronics systems for JET and MAST-U. The group is responsible for the subsystems for control and data acquisition of JET including Machine Control, Additional Heating and Diagnostics. The Group is also involved in the data acquisition systems on MAST and seeking contracts for ITER CODAC work based on our relevant experience developing and maintaining related systems here.

(3) Publication Group

The Publication Group is responsible for UKAEA publication and library services, including research data validation and open access compliance. It also carries out design work for internal and external clients. The group develop web sites, computer based training courses and image storage tools.

(4) Software Engineering Group

The Software Engineering Group is responsible for JET data systems and analysis tools as well as database and web applications for experimental and business operations. It provides research software engineering assistance to physics and engineering groups and is tasked with leading the development of a co-ordinated approach to software development across UKAEA.

The Role

Career Family:	Engineering	**Reports to:**	Software Engineering Group Leader
Role Title:	Senior Research Software Engineer	**No. of employees/ASWs**	0 Staff (Project Manage)
Level:	5	**Total No. of staff in resource**	0

Overall Purpose:

Provide Research Software Engineering (RSE) expertise for UKAEA by collaborating on projects with scientists and engineers, and providing help, advice, training and infrastructure. Contribute to developing the RSE team with the right skills, approaches and capacity to meet the changing needs of the organisation.

Accountabilities:

Deliver projects to develop or improve/extend research software over timescales of weeks to years

- Diagnose issues and design solutions considering full technical and human context
- Build relationships with Science and Engineering groups and to understand their software and computing needs and with internal and external partners to define future RSE projects and collaborations
- Help develop the team by shaping processes, developing services and mentoring colleagues to set high standards in quality, culture and practices
- Act as an expert consultant in one or more technical or domain specialism, advising projects, designing solutions in complex situations and developing skills in others
- Manage a portfolio of projects and other activities (including supervising the work of others) to ensure the aims are achieved with appropriate quality standards, timescales and costs and partners are kept informed
- Provide software development and research computing advice and help to scientists and engineers, including strategic aspects such as project scoping, technology choices, make vs buy decisions, sustainability planning, IP and licencing
- Lead initiatives to transform aspects of the wider software engineering culture and practice and contribute

Budget Responsibility:

Not applicable

Specific Qualifications/Experience:

Essential:

- Degree in a scientific, engineering or technical subject + PhD or experience working in an academic or industrial research environment
- Significant experience of developing well-designed, robust software in at least two languages used in scientific or engineering applications (particularly Python, C++, Fortran)
- Experience of applying and promoting good development practices (collaborative development, version control, automated testing, documentation)
- Working knowledge of developing and deploying software on Linux platforms
- Experience of leading a project and managing software lifecycle activities for software used by others
- Ability to communicate effectively, collaborate and influence people with various roles and backgrounds
- Appetite and ability to research and learn about new technologies and domains and to judge how to apply and share this knowledge
- Expertise and experience in at least one of the desirable criteria and ability to take on a related leadership role

Desirable – expertise & experience in any of the following

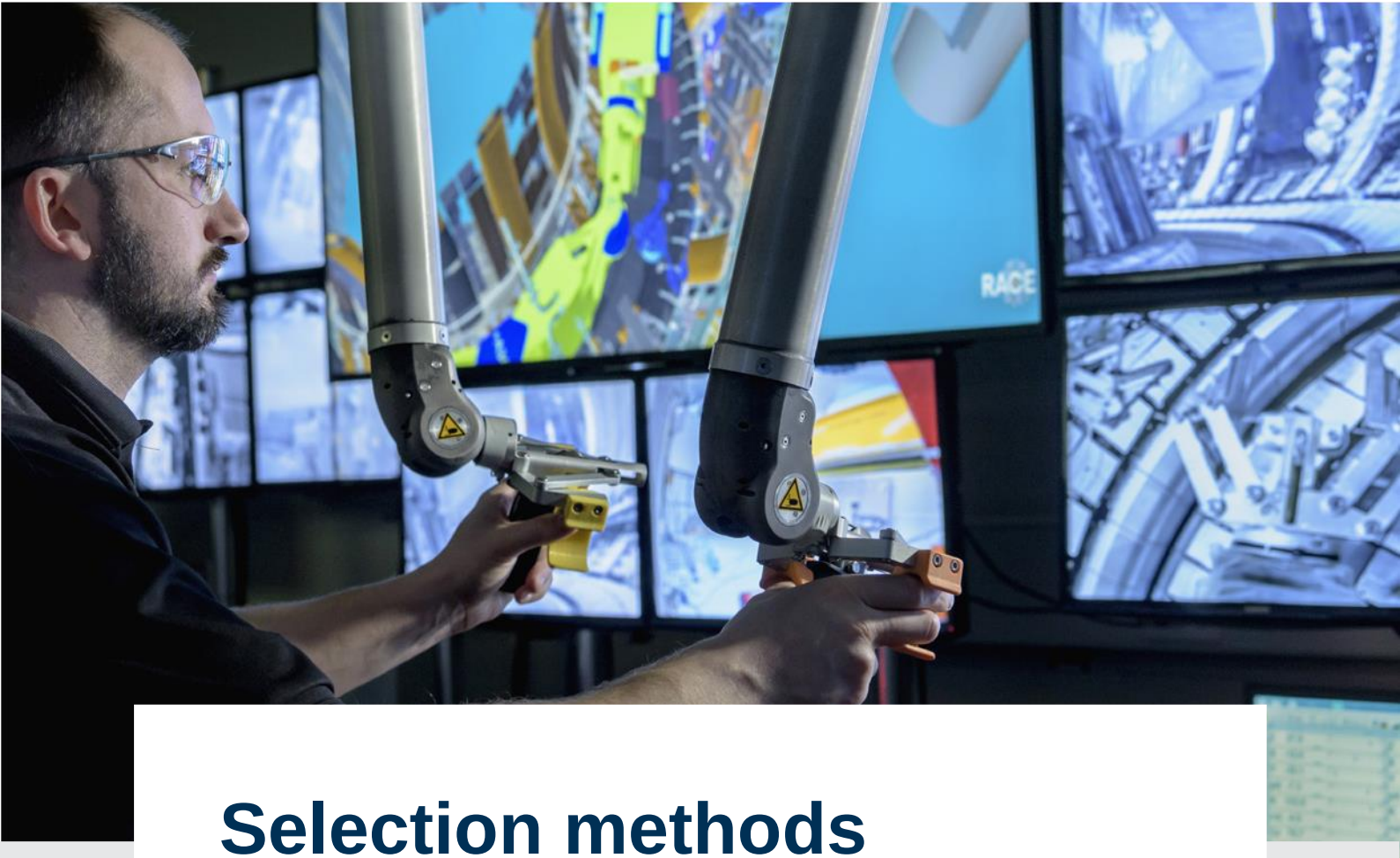
- Any of the research or technology disciplines related to UKAEA's activities
- Data and signal analysis and visualization
- Research data management, database design and administration
- Computational modelling and numerical simulation
- User interface design and web or GUI development

• Improving and extending large existing codebases and familiarity with legacy scientific languages (eg older-style Fortran, C, IDL) • Ability to transform early-stage research code into sustainable software for wider use • "Dev-ops" skills for configuring and managing deployment of software systems and developer tools in production (eg managing VMs, containers, packaging and build systems, web hosting environments, repository and CI systems, data storage and management systems, system monitoring) • Supervising, mentoring or line managing others (either formally or informally) and interest in pursuing this further • Making best use of scientific computing platforms such as compute clusters, HPC facilities, cloud systems or alternative architectures • Leading RSE-related initiatives (eg teaching & training, community, outreach or policy work)
Other Duties:
-

Technical/ Professional	70%	**Project Management**	30%	**People Management**	0%

Generic descriptors for all roles in this job family and level (This is standard information, please do not amend)	
The first two descriptors relate to an overview of the role for the level within this job family	
Role Snapshot	Job holders at this level plan, coordinate & perform engineering, design, testing and/or analysis work for a complete project of moderate scope or for significant packages of work within a major & diverse project. Job holders will be recognised as an internal expert in a specific field & will provide technical advice & guidance. May act as lead person, providing technical leadership & engineering solutions. May assign, coordinate & review the work of other engineers / apprentices.
Typical Representative Duties	Responsible for managing assigned projects & work packages in order to deliver required results within specification, time & cost parameters. Check/signing off work completed by others in their area of specialism to ensure quality & consistency. Coach & supervise less experienced colleagues & provide advice to other engineering colleagues in their field of expertise in order to develop overall capability. Within a specific area, set & monitor standards to establish & maintain best practice & quality. Effective management of risk and safety requirements. Identify opportunities for improvements & propose solutions in order to contribute to continuous improvement within UKAEA. Undertake or contribute to design studies on behalf of external customers. Communicate with a range of UKAEA colleagues to ensure a shared understanding of technical issues, work requirements & progress.
Decision Making	Negotiates & makes decisions regarding elements of projects. Makes decisions regarding how to resolve issues. Selects tools & methodologies for projects. Approves decisions & actions within the remit of policies & procedures.
Analytical Skills	Seek opportunities for the application of specialist skills & knowledge. Make final recommendations for the development of new engineering methods / techniques. Within established standards & precedents, the jobholder must identify, define & analyse alternative courses of action using analytical, evaluative and/or constructive thinking.
Project Role	Collaborates with others to define the project scope. Ensures projects are completed on time & within budget & all deliverable deadlines are met. Competent in project management. May collaborate externally on projects. May be working on cross-discipline projects. Takes projects from innovation through to implementation.
Budget Management	Negotiates budget requirements.

Communication & Influencing	Requires the skills & knowledge to understand, influence, drive, & negotiate with internal & external customers, suppliers & colleagues. Requires the ability to explain the implications of work & decisions. Develops & empowers others.
External Links	Works with both internal colleagues & external partners. Forms & maintains links with external professional networks, universities, suppliers & collaborators as relevant within the scope of the role. Publishes papers/reports.
People Management	May manage a section to ensure appropriate completion of work & development covering the full range of people responsibilities. Identify & propose recruitment and learning solutions.
Typical Technical Expertise, Experience & Skills	Demonstrates several years' experience towards chartered status. Either has or working towards Masters degree for Chartered Status. May be externally recognized in a narrow field.
UKAEA Organisational Knowledge	Understands how to influence project shaping & delivery.
Behavioural Competencies These are the typical competencies required at this level but may be tailored to reflect specific job types. Refer to the full competency matrix for examples of behaviours at each level.	
Passion	Nurturing science and technological excellence, remaining determined, flexible and positive to the challenges we face. Open to new ways of working and promoting diversity. Proud of who we are and enthusiastic about the pursuit of our mission.
Innovation	Seeking creative ways to change, solve problems and push scientific & technical boundaries. Working at the frontier of knowledge, being curious, building on ideas and challenging status quo always in a safe and inclusive manner.
Accountability	Taking ownership to achieve quality outcomes. Fostering a sense of urgency in delivering against our commitments in a safe working manner. Dedicated to our work, admitting mistakes and learning from them. Honest and always acting in the best interests of individuals and the organisation.
Business-minded	Commercially astute, seeking out new business opportunities and managing potential risks. Being cost conscious, acting with integrity, delivering on expectations and challenging what doesn't add value.
Delivery	Working together cooperatively to achieve the best possible result. Demonstrating a 'can do' approach which delivers 'fit for purpose' quality in all we do. Following the process and responding positively to change and continuous improvement.



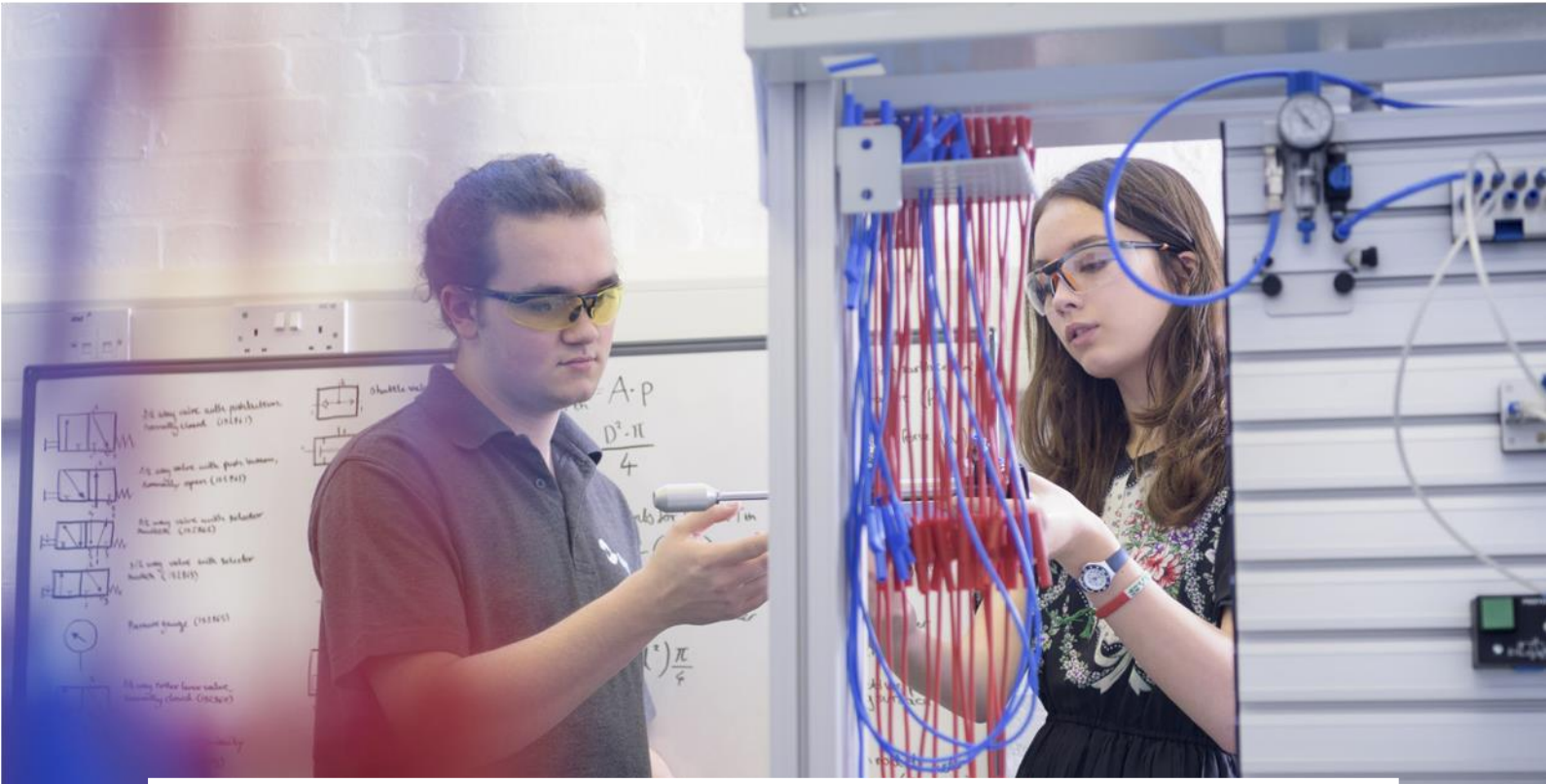
Selection methods

We follow a structured process to ensure our recruitment process is fair and consistent. Based on the quality of the applications we may choose to do a telephone screening initially should your application be shortlisted.

Our final selection process may involve a number of assessments of which you may be required to complete online prior to your interview or on the day.

On the day you will be required to attend a panel interview and in some cases you may be asked to deliver a short presentation to give you an opportunity to demonstrate your suitability for this role.

The assessment criteria for each role may vary, however in all cases the methods selected will ensure you are given a good opportunity to display your skills and experience.



Employee benefits

There is a friendly and collaborative atmosphere at UKAEA. Ideas and results are openly shared at weekly MAST and JET physics meetings and Culham colloquia give staff an opportunity to hear from external scientific speakers – both from the international fusion community and the wider scientific world.

Annual Leave

The Annual Leave entitlement for employees is 25 days (pro rata for part-time employees) rising to 28 days after five years of service and then to 30 days after ten years of service. In addition employees are entitled to 10.5 holidays (including bank holidays and privilege days). Employees work a revised working week to cover the days that fall between Christmas and New Year when the site is closed. This means that no annual leave needs to be saved to cover these days. Employees are able to carry over up to ten days annual leave to the next leave year, if they wish. There is also the opportunity to accrue time off in lieu of extra work carried out as overtime, instead of receiving a payment, subject to line manager's discretion.

Bonus scheme

Employees are normally entitled to bonus payments depending on UKAEA performance in any given financial year. Milestones are set up in a way so that employees' performance has an influence on UKAEA performance in a given area. Bonus payments are paid on an annual basis as a percentage of salary (maximum 7%).

Flexible working

UKAEA promotes flexible working to enable employees to maintain a healthy work-life balance. Depending on the business needs, this can range from part time arrangements to allow for 'the school run' or elderly care to occasional home working and the ability to flex hours to fit with lifestyle choices. UKAEA is also open to job sharing unless otherwise stated.

happy to talk flexible working

Learning and development

UKAEA is committed to developing all members of staff by offering a wide range of programmes and support to suit their individual career aspiration. UKAEA's APS System gives all employees and managers the opportunity to highlight learning and development needs and opportunities throughout the year. In engineering these range from an advanced apprenticeship scheme certified by IMechE and IET, a graduate scheme also certified by IMechE and IET with IOP pending, we are similarly accredited for our Continuous Professional Development Schemes and are members of the IET Power Academy. In the physics field we offer PhD and MSc opportunities and Culham Research Fellowships. In addition to the structured development schemes we also provide individual development as needed by the business and career trajectories, including management development opportunities.

UKAEA Discounts

UKAEA Discounts is a free to use benefit, paid for by UKAEA, and offers numerous opportunities to regularly save money on normal everyday shopping. It has the potential to save you many £10s or even £100s per year.

Pensions

Employees of UKAEA are automatically enrolled into the UKAEA Combined Pension Scheme (CPS), which is a final salary defined benefit scheme. It includes the following benefits for members:

- A pension and lump sum payment at Normal Pension Age of 60. The pension is based on final salary and calculated as: years' service x pensionable final earnings x 1/80th. The lump sum is: 3 x the annual pension;
- Options at retirement to convert lump sum into additional pension or to commute pension to additional lump sum;
- Options for early retirement or partial retirement;
- Death in service benefits including lump sum of 2 x pensionable final earnings and spouse and dependents pensions;
- Spouse and dependents pensions on death after retirement;
- Ill health benefits of payment of pension and lump sum with possible enhancement;
- Additional Voluntary Contributions scheme.
- Employee contributions qualify for tax relief and the UKAEA also contributes. Some benefits are reduced for service less than 2 years. Employees can opt out of the scheme. Further details of the scheme can be found at the following website: **http://www.uk-atomic-energy-pensions.org.uk**
- Note: The CPS is expected to close for future accrual of benefits at some point in the future as part of the reform of all public sector pensions, and most UKAEA employees and all new employees will then be transferred to the Civil Servants and Others Pension Scheme (known as alpha) for future benefits.
- This is a Career Average Revalued Earnings (CARE) defined benefits scheme. It includes very similar benefits to the CPS, but the pension is built up each year based on 2.32% of salary and inflation each year.
- Further details of the alpha scheme can be found at the following website: **http://www.civilservicepensionscheme.org.uk/members/alpha-guide/**
- Benefits earned in the CPS at the date of the change to the alpha arrangement will be frozen and when paid will be based on service to the date of joining the alpha scheme and pensionable final earnings when the member leaves the alpha scheme or leave employment (whichever is earlier)
- i.e. the link to final salary for CPS benefits is maintained

Health and wellbeing

Research has shown that healthy and happy staff contribute more to their employer as well as the nation as a whole. As part of our health and wellbeing programme UKAEA provides a range of free benefits helping to further improve your health and wellbeing. There is an on-site Occupational Health service. There is also an Employee Assistance Programme which is a welfare initiative, available to all staff, by telephone, giving support and counselling, covering a wide variety of subject areas, such as financial, personal, work- related and legal.

Emergency family leave (Time off for dependants)

At discretion a member of staff can request time off work to deal with an emergency involving a dependent. This leave is to allow employees to deal with unexpected or sudden problems and to make longer term arrangements as necessary. There is no qualifying period necessary for this leave and depending on circumstances some of the time off may qualify to be paid.

Maternity leave

Where an employee qualifies for contractual maternity pay (at least one year's effective service), she will receive her normal rate of pay during the 26 week ordinary maternity leave period.

Following this the first 13 weeks of additional maternity leave will be paid at the appropriate statutory rate of SMP. The remaining 13 weeks of additional maternity leave will be unpaid.

Adoption leave and Paternity leave schemes are also offered.

Relocation

New entrants who are required to move their home to take up a permanent appointment may qualify to be given some assistance towards their removal expenses. This is subject to an HMRC ceiling of £8,000.

Cycle to Work Scheme

The scheme provides employees with the opportunity to purchase a new bike through a salary sacrifice scheme. The money will come out of your monthly salary (before tax). Employees are entitled to borrow up to £1,000 for a bike and accessories.

Parking facilities

Parking facilities are available across the site. Parking spaces are located close to offices and are free of charge. The site is monitored 24h/7.

Mentoring scheme

To help support its staff through their careers and professional development UKAEA have introduced a mentoring programme. Mentoring is a relationship in which one person, the mentor, helps another, the mentee, to discover more about themselves, their potential and capability. It can assist an individual by enabling them to seek guidance, support, help and feedback. The mentoring programme is a formal process which will be regularly reviewed and monitored. It recognises that individuals have different goals and aspirations and it endeavours to meet the individual's requirements and needs as well as those of UKAEA.

Eating and Drinking

At UKAEA, catering outlets such as shops, a sandwich bar and a restaurant have a great range of food and drinks for staff to choose from throughout the day. The majority of the food is made in-house.

There is also a Costa Coffee outlet offering fresh coffee and cakes.

Social clubs and events

There is a social club (CSSA) which organises discounted theatre trips to various London theatres for its members, as well as supporting a wide range of clubs and societies including Craft, Yoga, Jive, Netball and Kung Fu. UKAEA also runs an annual softball tournament as well as other seasonal activities throughout the year. During winter, colleagues have been challenged to a Winter Triathlon which includes a pub-style quiz, a skittles tournament and traditional Aunt Sally game.

Athena Swan

UKAEA is delighted to have been awarded the Athena SWAN bronze award which recognises the commitment of advancing the careers of women in Science, Technology, Engineering, Maths and Medicine (STEMM) employment in higher education and research. The Athena Swan panel works continuously on new initiatives to support greater gender equality in the workplace.

Core values

UKAEA prides itself on being a great place to work and are committed to the continual development of our people. The core values are Passion, Innovation, Leadership and Business Minded.

How to apply

Apply online

Visit **http://www.ccfe.ac.uk/Jobs.aspx** to apply via our online portal. You will need to complete an online application form. You will also be prompted to upload an updated CV and a cover letter.

Note: You may be asked to answer competency related questions. Please type your response in Word and then copy & paste on to the online application form. The system may time out and you are unable to save your responses and come back later. However, the rest of the application can be completed at your convenience and you can save your responses for review at a later stage but before final submission.

Please be advised that this vacancy may close earlier than stated if large or sufficient numbers of applications are received.

Help and assistance

For assistance or further information please email our recruitment team at **recruitment@ukaea.uk**

The UK Atomic Energy Authority's mission is to lead the commercial development of fusion power and related technology, and position the UK as a leader in sustainable nuclear energy

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Find out more
www.gov.uk/ukaea

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