Application Pack

Principal Engineer
Vacancy Ref: 4911
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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 1700 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;
• A conceptual design programme for a spherical tokamak fusion reactor, STEP, to provide a leadership position for UK industry in delivering fusion power
• 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 £160m, with income primarily received through Euratom, BEIS and EPSRC programme funding.
The Role

<table>
<thead>
<tr>
<th>Career Family:</th>
<th>Engineering</th>
<th>Reports to:</th>
<th>Line Manager within the ‘Engineering Authority’</th>
</tr>
</thead>
<tbody>
<tr>
<td>Role Title:</td>
<td>Engineering Authority – L5</td>
<td>No. of employees/ASWs FRM for: (direct line management)</td>
<td>0</td>
</tr>
<tr>
<td>Level:</td>
<td>5</td>
<td>Total No. of staff in resource management chain</td>
<td>Up to 5 dependent on works</td>
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<tr>
<th>Overall Purpose:</th>
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Office of the Chief Engineer

The ‘Office of the Chief Engineer’ provides technical governance for the full lifecycle of all UKAEA’s engineering activities, providing the ‘Engineering Authority’ and ‘Fusion Safety Authority’ that are so important to realising effective, safe technical outcomes.

This post is based within the ‘Engineering Authority’ strand of the Office of the Chief Engineer, which is a collective of engineering specialists and generalists. The organisation and delegation of responsibilities from the UKAEA Chief Engineer to the ‘Engineering Authority’ is achieved and co-ordinated via ‘Letters of Delegation’ from the UKAEA Chief Engineer for critical appointments:

- Facility Chief Engineers’ within the Engineering Authority that are charged with the ‘Design Authority’ and ‘Intelligent Customer’ functions for their allocated facility. Includes independent challenge of delivery teams to achieve performance, compliance, function and safety wherever that is in the plant lifecycle (design, deployment, operation, modification, decommissioning…)
- Capability Leaders / Co-ordinators’ within the Engineering Authority that orchestrate organisation wide knowledge and ways of working on a critical cross-cutting topic of high impact. Includes critical disciplines (e.g. electrical) and technologies (e.g. magnets).
- Statute & Regulation Specialists’ based across UKAEA that establish, evolve, consult and where appropriate monitor practices that link to compliance (e.g. LOLER, PED, ATEX/DSEAR, etc).

As a member of the Office of the Chief Engineer, the post-holder is a role model within UKAEA and will be held to high behavioural standards. The key values, as agreed by members of the Engineering Authority are: integrity and honesty; accessibility and visibility; empowering and enabling; proportionate and targeted; learning and improving.

The Post

The purpose of this post is to discharge their specific delegations and then to support the Engineering Authority across UKAEA. At this level, typically the role will typically comprise two of:

- delegation as a Facility Chief Engineer for up to two ‘lower’ complexity facilities (e.g. MDF)
- delegation as a Technical Capability Co-ordinator for a given discipline (e.g. magnets)
- support to L6 and L6* members of the Engineering Authority as they discharge their delegations for ‘higher’ (e.g. AGHS) /’highest’ complexity facilities (e.g. JET) and Technical Capability Leaders (e.g. electrical)

Accountabilities:

A typical day in this role will range from supporting a Facility Chief Engineer by reviewing a specific aspect of a world-first experiment that goes beyond the established operating conditions for a flagship tokamak facility to participating in the design review of a plant modification that expands the capability of a technology development test bed, from addressing a low severity non-conformance for a fabrication in construction within the supply chain to developing a training deck for a group of onboarding engineers on the expectations for technical quality in collaboration with our resident Technical Improvement Leader.

Each day presents technical problems of high complexity, interacting technical disciplines, numerous stakeholders, incomplete or immature information and no clear correct answers.
The post holder will abide by the specific terms and escalation criteria laid down in any relevant 'Letters of Delegation'. Accountabilities will typically include a combination of the items below with a necessary close interaction across the Engineering Authority between the various Facility Chief Engineers, Deputy Facility Chief Engineers and Capability Leaders /Co-ordinators to bring the right blend of knowledge and experience to bear on each matter:

**Design Basis:** To provide specialist knowledge of and/or translation between several engineering disciplines to allow acceptance or rejection of plant proposals, modification, exceptional operations and non-conformances.

**Technical Risk Management:** To ensure that the operational envelope of the facilities is defined with an appropriate balance of technical risk between performance, reliability and lifetime. In turn, seeking improved operational performance, utilisation and reliability on an ongoing basis.

**Processes & Standards:** To apply UKAEA Quality Management System and ways of working. Strives to enshrine accrued knowledge and lessons learned in improved training, processes and ways of working that can be leveraged across UKAEA.

<table>
<thead>
<tr>
<th>Aspect &amp; Role</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Project &amp; Programme: Gates &amp; Boards</strong></td>
<td>Delegated representative of the Engineering Authority on lower impact projects / facilities</td>
</tr>
<tr>
<td><strong>Change Boards</strong></td>
<td>Delegated 'Design Authority' and thus representative of the Engineering Authority on lower impact projects / facilities:</td>
</tr>
<tr>
<td>- Defining and leading reviews, exercising professional judgement as to the scope and number of reviews in line with risk.</td>
<td></td>
</tr>
<tr>
<td>- Final approval (and / or further delegation to a discipline specialist) on outputs</td>
<td></td>
</tr>
<tr>
<td>Providing support to others (e.g. scrutiny of specific aspects, delivering first pass scrutiny, etc) for higher impact projects / facilities.</td>
<td></td>
</tr>
<tr>
<td><strong>Technical Governance</strong></td>
<td>Cross-functional gated reviews to scrutinise delivery. Extends from statement of user need through design, build, deployment and at operational intervals. Approval of plant design changes and their substantiation (intent, configuration, operational envelope). Includes surveillance through build, test, operation, maintenance to ensure design upheld.</td>
</tr>
<tr>
<td>Member of Machine Protection Working Group (or equivalent collective)</td>
<td>Scrutinise, advice and arbitrate on complex matters affecting plant integrity. Briefing and escalating within the Engineering Authority and to Duty Holders to influence operational approach and future plant modifications.</td>
</tr>
<tr>
<td>May be delegated with through-life asset management of an important plant system with some complexity.</td>
<td></td>
</tr>
<tr>
<td><strong>Operational Exceptions</strong></td>
<td>Scrutiny and multi-disciplinary sanction of planned exceptions to the operational envelope (e.g. experiment beyond prescribed limits).</td>
</tr>
<tr>
<td>Reviewer and/or Approver for lower complexity facilities</td>
<td>Providing support to others (e.g. scrutiny of specific aspects, delivering first pass scrutiny, etc) for higher impact projects / facilities.</td>
</tr>
<tr>
<td><strong>Deviations</strong></td>
<td>Scrutiny and sanction of planned exceptions to the Quality Management System</td>
</tr>
<tr>
<td>Reviewer and/or Approver for lower complexity facilities</td>
<td>Providing support to others (e.g. scrutiny of specific aspects, delivering first pass scrutiny, etc) for higher impact projects / facilities.</td>
</tr>
</tbody>
</table>
| Non Conformance Reports | In cases of low severity:  
- Approver of Containment & Correction  
- Lead investigation for Root Cause  
In case of higher severity, provide support. | Scrutiny and sanction of correction/containment. Identify root cause and opportunities for improvement. |
|-------------------------|-------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------|
| UKAEA Policy, Processes & Standards | Applies ways of working guided by senior practitioners and/or with heavily bounded scope for escalations. Notes potential improvements for others to pursue. May be delegated with (but not expert to wholly originate):  
- Monitoring key policy, process, standards and practices.  
- Baselining and identifying opportunities for improvement  
- Organisation of UKAEA knowledge activities for a capability / technology | Ensure effective application of UKAEA Quality Management System and ways of working together with its continuous, targeted improvement to meet the shifting organisational needs. |

Budget Responsibility:  
In all cases, the technical advice and decision making from this role heavily shapes the expenditure of multi-million facility budgets.
Specific Qualifications/Experience:

**Knowledge & Experience**

Each of the appointments relevant to this post (e.g. Facility Chief Engineer, Capability Co-ordinator) rely upon upholding the values of the Office of the Chief Engineer, familiarity with the UKAEA facilities, requisite training and demonstration of key competencies. Formal appointments will follow a suitable period of onboarding for both internal / external hires.

**Essential**

Some experience of the following, as demonstrated by track record (roles, responsibilities, projects, etc):

- Delivering and utilising complex industrial or research plant (e.g. process, oil/gas, nuclear)
- Delivery across Plant Lifecycle (Need, Design, Build & Test, Commission, Operate, Monitor, Maintain & Decommission)
- Relevant industrial regulations, codes, standards and norms together with tailoring their application within a diverse business

Experience working within and leading multi-disciplinary teams, to include several specialties from the following:

- Engineering Delivery; Operations; Safety Case; Machine / Plant / Asset Protection; Asset Management & Maintenance; Quality Assurance; Waste Management; Environment; Safety

**Desirable**

Some technical knowledge of one or more of the following:

- Disciplines: Process Engineering, Mechanical Engineering, Electrical Engineering, Materials Engineering, Physics
- Technologies: Magnets, Vacuum, Cryogenics, Heat Exchange, Nuclear Infrastructure (Shielding, Ventilation)

Some experience of the following, as demonstrated by track record (roles, responsibilities, projects, etc):

- Technical Risk Assessment & Management for competing requirements (Reliability, Safety, Performance, Lifetime, ...)
- Delivery and exploitation of innovative engineering for research and development purposes, ideally leveraging personal skills or teams that have included: Project Management, Systems Engineering, Quality & Continuous Improvement

**Soft Skills & Traits**

**Essential**

- High standards with respect to delivering with quality and compliance
- Clear drive for personal growth, organisational learning and continuous improvement

**Desirable**

- Able to be both detail-oriented & consider ‘bigger’ picture, dependent on the situation
- Clear and effective communicator at all levels (workshop to C-suite)

**Other Duties:**

- Contributes to mentoring, coaching and training across UKAEA
- By exception, undertake and contribute to engineering project management work and engineering design work where an unusually high level of system integration has been found to be necessary

**Technical/Professional 60% Project Management 20% People Management 20%**

**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.

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, 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 Commitment, Trust and Innovation.
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.

www.gov.uk/ukaea