Australian Government

ANSTO
Science. Ingenuity. Sustainability.

POSITION DESCRIPTION

Position Title:	Electrical Engineer / Senior Electrical Engineer
Cluster / Business Unit / Division	Clayton Campus
Section or Unit:	Engineering – Electrical
Classification:	Band 5/6 Linked
Job Family:	Engineering
Position Description Number:	PD-1839
Work Contract Type:	Technical/Professional
STEMM/NON-STEMM:	STEMM

POSITION PURPOSE

The primary objective of the Electrical Engineer is to provide professional electrical engineering direction and subject matter expertise for the design, monitoring and maintenance of electrical systems associated with the accelerator, beamlines and facility infrastructure at ANSTO Australian Synchrotron to maintain the integrity and reliability of these systems, and to provide strategic planning of its ongoing improvements to reliability and development to meet the statutory requirements and standards.

ORGANISATIONAL ENVIRONMENT

ANSTO leverages great science to deliver big outcomes. We partner with scientists and engineers and apply new technologies to provide real-world benefits. Our work improves human health, saves lives, builds our industries and protects the environment. ANSTO is the home of Australia's most significant landmark and national infrastructure for research. Thousands of scientists from industry and academia benefit from gaining access to state-of-the-art instruments every year.

The Australian Synchrotron provides world-leading technical capability, and the nucleus around which new science and industry networks form as researchers interact. The synchrotron delivers better and faster experimental techniques that not only enhance current fundamental and applied research, but also opens new avenues of investigation to Australian science. The facility promotes international collaboration to enable leading-edge research and development, and is a hub for research that greatly benefits Australia and its regional neighbours.

The Engineering Group at the Synchrotron provides comprehensive engineering, technical, safety, reliability, design, build and maintenance services, delivering engineering solutions to the Beamline Science Group including supporting the delivery of major capital programs and engineering upgrades. The Engineering Group comprises of the Mechanical Engineering Team, Mechanical Technicians Team, Electrical Engineering Team and the Facilities Team including Plant maintenance.

ACCOUNTABILITIES & RESPONSIBILITIES

Key Accountabilities – Band 5

- Initiate electrical engineering projects to maintain or increase the performance of synchrotron accelerators and beamlines.
- Manage projects which have a significant electrical aspect.
- Produce electrical designs and manufacturing drawings using software packages including AutoCAD, PowerCAD.
- Drive improvements in the AutoCAD drafting function.
- Contribute to the design, installation and commissioning of new projects by the provision of electrical engineering and power electronics expertise and capability.

- Prepare and maintain documentation for commissioning, fault finding and testing in conjunction with other ANSTO staff including electrical and mechanical schematics, test procedures, reports, and cable schedules.
- Ensure all electrical designs and installations conform to Australian Electrical Standards.
- Lead specialist engineering in power quality, AC distribution, EMC, cable segregation and earthing schemes.
- Update and develop specialist electrical engineering standards for future beamlines and major projects.
- Provide specialist support to the Accelerator and Beamlines as part of a multidisciplinary team or independently.
- Perform LV and HV switching, including switching schedules and access permit documentation.
- Undertake additional duties as required and during period of leave of other staff.

Key Accountabilities – Band 6

- Interpret the needs and requirements of clients to design and maintain a high level of availability and reliability for equipment and machines at the Australian Synchrotron.
- User significant specialist knowledge and extensive expertise in systems and design engineering and beamline infrastructure to provide technical leadership, advice and guidance to stakeholders.
- Lead installation teams through strategic direction based on requirements of systems performance and project schedules and budgets.
- Design, develop and produce electrical designs and manufacturing drawings using software packages including AutoCAD, PowerCAD, Zuken E3, SolidEdge 3D.
- Manage specialised projects requiring considerable interpretation and understanding of organisation operations and electrical systems, including the organisation of technical concepts and interdependencies to resolve specialised problems and increase the performance of accelerators and beamlines.
- Develop complex and advanced engineering technical solutions across a diverse range of equipment, projects and operations that provide the world's best capabilities while optimising cost-benefit for electrical infrastructure and systems.
- Establish and maintain relationships with relevant local, national and international industry communities including other scientific facilities, and drive collaborative activities for the benefit of all parties.
- Develop and implement safety protection protocols and risk analysis for electrical infrastructure.
- Lead the installation of systems and utilities for accelerators and beamlines, and design interfaces with other disciplines on the requirements and deliverables.
- Ensure all commissioned work fully complies with ANSTO quality and environmental frameworks and safety procedures.
- Lead and manage facility-wide activities for equipment Failure Modes and Effects Analyses and Controls Hazard and Operability Studies and report to senior management.
- Manage electrical infrastructure databases and allocate equipment and area specific identifiers.
- Prepare and maintain documentation for commissioning, fault finding and testing in conjunction with other ANSTO staff including electrical and mechanical schematics, test procedures, reports, and cable schedules.
- Ensure all electrical designs and installations conform to Australian Electrical Standards.
- Lead specialist engineering in power quality, AC distribution, EMC, cable segregation and earthing schemes.
- Perform strategic planning and implementation of maintenance activities for electrical equipment.
- Establish quality working relationships and ongoing communication with clients and stakeholders.

- Review electrical project handovers, documentation and maintenance requirements, sign-off maintenance strategies and including site inspections to ensure equipment installed complies with safety and maintenance requirements.
- Rationalise maintenance procedures and refine preventive maintenance plans on a basis of cost effectiveness and measurable outcomes.
- Develop multi-year capital expenditure budgets and plans for aging, non-compliant and end-of-life electrical infrastructure.
- Update and develop specialist electrical engineering standards for future beamlines and major projects.
- Provide specialist support to the Accelerator and Beamlines as part of a multidisciplinary team or independently.
- Perform LV and HV switching, including switching schedules and access permit documentation.
- Review and identify opportunities to improve electrical, safety, quality assurance, documentation, maintenance and ensure compliance.
- Conduct safety and technical audits.
- Promote a strong safety culture including risk assessments and contractor supervision for high-risk work.
- Undertake additional duties as required and during period of leave of other staff.

Decision Making

Band 5

This role makes decisions related to:

- Matters relating to electrical standards.
- Circuit discrimination, protection settings, cable selection.
- AC distribution, EMC and earthing design.
- Improvements in the implementation of the AutoCAD drafting function.
- The levels of authority delegated to this position are those approved and issued by the Chief Executive Officer. All delegations will be in line with the ANSTO Delegation Manual AS-1682 (as amended or replaced).

Band 6

This role makes decisions related to:

- The position is accountable for the accuracy, integrity, quality, full implications and scope of the content of advice and recommendations and is required to ensure that decisions are based on sound evidence and subject matter expertise.
- Decide the design requirements to meet performance objectives, and the appropriateness of proposed solutions to meet those requirements.
- Accountable for finding ground-breaking solutions for complex issues arise for which there is no readily available source of advice or guidance.
- Determine key work priorities within the context of agreed work plans and consult with the stakeholders on complex, sensitive and major issues that have significant impact on engineering aspects of projects and work packages.
- Decisions on corrective actions when dealing with non-compliances to technical performance requirements.
- The position has influence on defining engineering methods, technology and implementation of equipment and methodologies.
- Matters relating to electrical standards.
- Circuit discrimination, protection settings, cable selection.
- AC distribution, EMC and earthing design.

- The levels of authority delegated to this position are those approved and issued by the Chief Executive Officer. All delegations will be in line with the ANSTO Delegation Manual AS-1682 (as amended or replaced).

Key Challenges

- Ensuring successful project completion whilst managing conflicting priorities and deadlines for different stakeholders including short lead times.
- Ensuring electrical safety and keeping abreast of recent developments in field, ensuring continual improvement and implementation of best practise.
- Improving customer service, response times and delivery efficiencies.
- Ability to communicate across engineering and scientific disciplines and interpret scientific requirements and translate them to a system specification.
- Limited access to the machine when operating as a 24/7 facility.
- Ensuring ongoing reliability and performance of some of the site's ageing electrical systems.
- Providing acceptable solutions to sometimes complex technical problems, without impact on other systems and supporting a wide array of electrical infrastructure and equipment requiring a wide range of technical skills that may not be readily available.

KEY RELATIONSHIPS

Who	Purpose
Internal	
Group Leader Electrical Engineering	• Regularly or as required to discuss priorities where higher level input is required, projects and to provide advice on technical feasibility/practicality on challenges relevant to their area of responsibility
Other Engineers/Engineering Group	• Regularly or as required to understand design concept provided, offer advice and/or seek clarification or intent of some design aspects, arrange for drafting reviews, provide advice in use of 3D CAD software and disseminate this knowledge as required
Beamline Scientists	• As required mainly in the context of gaining information on requirements and intent of an assigned project or task, provide updates on progress, seek clarification as required
External	
Suppliers	• Communicates specifications and criteria for procurements and problem solving

POSITION DIMENSIONS

Staff Data	
Reporting Line	Reports to the Manager, Electrical Engineering
Direct Reports	Nil
Indirect Reports	Nil

Financial Data (2022/2023)	
Revenue / Grants	-
Operating Budget	-
Staffing Budget	-
Capital Budget	-
Assets	-

Special / Physical Requirements	
Location:	Clayton Working in different areas of designated site/campus as needed
Travel:	May be required travel to ANSTO sites from time to time Frequent travel to ANSTO sites within Australia Field work in remote locations
Physical:	Office based physical requirements (sitting, standing, minimal manual handling, movement around office and site, extended hours working at computer) Standing for long periods Frequent movements (climbing, stooping, kneeling, crouching, crawling) Working in a loud environment Public speaking Industrial facility physical requirements (lifting, standing for long periods, operating machinery, equipment and manipulators) Wearing personal protective equipment for the handling of hazardous and/or radioactive materials Working in confined space environment including wearing respiratory equipment
Radiation areas:	May be required to work in radiation areas under tightly regulated conditions Perform duties in an area where radioactive materials are handled under tightly controlled safety conditions Perform duties with and in an area where hazardous chemicals or materials are handled under tightly controlled safety conditions
Hours:	Willingness to work extended and varied hours based on operational requirements After hours work may be required for short and infrequent periods
Clearance requirements:	Satisfy ANSTO Security and Medical clearance requirements Obtain and maintain appropriate federal government clearance

Workplace Health & Safety	
Specific role/s as specified in AP-2362 of the ANSTO WHS Management System	All Workers Officer (definitions found in appendix 1 of AG-2362) Group Executive / General Manager Managers / Leaders / Supervisors Other specialised roles identified within the guideline a position holder may be allocated to in the course of their duties

ORGANISATIONAL CHART

Refer to published Organisational Chart

KNOWLEDGE, SKILLS AND EXPERIENCE

Band 5

1. Degree in Electrical Engineering.
2. A minimum of 5 years of engineering experience in a technical or scientific environment.
3. Strong analytical and problem-solving skills balanced by the ability to develop practical solutions.
4. A strong interest in the design and integration of electrical power and power electronic systems.
5. Reasonable knowledge of AutoCAD and electrical drafting practice.
6. Strong knowledge of LV design including circuit breaker sizing and discrimination, cable sizing and derating, earthing and earth fault impedance.
7. Good understanding and experience using Australian electrical standards, especially AS3000 and AS3008.
8. A strong knowledge in project management.
9. The ability to work autonomously or with a group to produce quality work within tight time constraints.
10. An aptitude for and a willingness to undertake hands on tasks and to use initiative.
11. Good oral and written communication skills.

Band 6

In addition to Band 5 above:

1. Degree in Electrical Engineering with professional registration.
2. Diploma in Project Management.
3. A minimum of 10 years of engineering experience in a technical or scientific environment.
4. Proven ability in delivering electrical solutions through providing technical expertise and problem solving.
5. Knowledge of, and experience with particle accelerators and beamline equipment.
6. Demonstrated ability to effectively communicate to a wide audience including tradespeople, professionals and management.
7. Knowledge of Australian Standards, electrical safety procedure & statutory requirements and ability to research and apply them within the workspace.
8. Demonstrated ability to encourage a strong safety culture.
9. Pro-active, deadline driven, and reliable in following through with actions.
10. Strong time management, planning and organisational skills.

Linked Role Transition

Transition to the higher band within the linked role is not automatic and ability to perform Band 6 accountabilities will need to be demonstrated and assessed. This can be done by completing the attached form and completing a full written submission demonstrating and justifying how an employee meets the transition requirements.

VERIFICATION

This section verifies that the line manager and appropriate senior manager/executive confirm that this is a true and accurate reflection of the position.

Line Manager		**Delegated Authority**	
Name:	Craig Millen	Name:	Brad Mountford
Title:	Manager, Electrical Engineering	Title:	Senior Manager, Engineering
Signature:		Signature:	
Date:		Date:	

Electrical Engineer/Senior Electrical Engineer PD-1839 Band 5 to Band6 Transition Checklist	
Name:	
Band 6 Commencement Date:	
Assessment Date:	

Written submission demonstrating and justifying how the employee meets requirements must also be attached.

Requirements for transition	Met Criteria
a) A minimum of 10 years of engineering experience in a technical or scientific environment working as Electrical Engineer at Band 5) OR b) Minimum 10 years equivalent experience	☐ Yes ☐ No ☐ Yes ☐ No
Degree in Electrical Engineering with professional registration	☐ Yes ☐ No
Extensive experience [include details] and demonstrate meeting all below requirements	☐ Yes ☐ No

Demonstrated ability to independently and responsibly perform Band 6 accountabilities and apply required knowledge, skills and experience for the band 6 position including:	
Undertake band 5 accountabilities at a technical expert level and independently without supervision or guidance	☐ Yes ☐ No
1. accountable for the accuracy, integrity, quality, full implications and scope of the content of advice and recommendations	☐ Yes ☐ No
2. Decide the design requirements to meet performance objectives, and the appropriateness of proposed solutions to meet those requirements.	☐ Yes ☐ No
3. Accountable for finding ground-breaking solutions for complex issues arise for which there is no readily available source of advice or guidance.	☐ Yes ☐ No
4. Determines key work priorities within the context of agreed work plans and consult with the stakeholders on complex, sensitive and major issues that have significant impact on engineering aspects of projects and work packages.	☐ Yes ☐ No
5. Make decisions on corrective actions when dealing with non-compliances to technical performance requirements.	☐ Yes ☐ No
6. Has influence on defining engineering methods, technology and implementation of equipment and methodologies.	☐ Yes ☐ No
7. Proven ability in delivering electrical solutions through providing technical expertise and problem solving.	☐ Yes ☐ No
8. Knowledge of, and experience with particle accelerators and beamline equipment.	☐ Yes ☐ No
9. Demonstrated ability to effectively communicate to a wide audience including tradespeople, professionals and management.	☐ Yes ☐ No

Attach written submission demonstrating and justifying how the employee meets <u>each</u> of the above requirements.

Manager Recommendation

I have reviewed the employee's competence in accordance with Linked Role PD-1839 and certify that the employee meets all requirements for transition and recommend transition from Band 5 to Band 6 be endorsed as demonstrated in the attached written submission detailing how the employee meets each of the requirements.

Name & Title:			
Signature:		Date:	

I have reviewed all information and approve transition from Band 5 to Band 6.

Name & Title:			
Signature:		Date:	
Effective date of transition:			

Appendix 1

ANSTO Job Families
Accounting & Finance
Administration
Communications & Marketing
Compliance & Regulation
Engineering and Technical
Human Resources
ICT & Digital Solutions
Information & Knowledge Management
Legal
Manufacturing
Monitoring & Audit
Operations
Organisational Leadership
Project & Program
Research
Science
Security & Intelligence
Senior Executive
Service Delivery
Strategic Policy
Trades & Labour