RESEARCH FELLOW

DEPARTMENT/UNIT	Department of Electrical and Computer Systems Engineering
FACULTY/DIVISION	Faculty of Engineering
CLASSIFICATION	Level A
DESIGNATED CAMPUS OR LOCATION	Clayton campus

ORGANISATIONAL CONTEXT

Everyone needs a platform to launch a satisfying career. At Monash, we give you the space and support to take your career in all kinds of exciting new directions. You'll have access to quality research, infrastructure and learning facilities, opportunities to collaborate internationally, as well as the grants you'll need to publish your work. We're a university full of energetic and enthusiastic minds, driven to challenge what's expected, expand what we know, and learn from other inspiring, empowering thinkers. Discover more at www.monash.edu.

The **Faculty of Engineering** is one of the largest in Australia, renowned worldwide for the quality and calibre of our teaching, research and graduates. We offer a comprehensive range of undergraduate, graduate, postgraduate and higher degree by research programs in a wide range of engineering disciplines. Our research activities provide a platform for establishing a thriving educational enterprise and our staff are committed to creating a dynamic learning environment. The research activities range from fundamental studies to research with a strong applications orientation. To learn more about the Faculty of Engineering, please visit our website.

The **Department of Electrical and Computer Systems Engineering** aims to provide high quality programs for undergraduate and research students as well as undertaking and publishing high quality research. We offer internationally recognised undergraduate and research programs in telecommunications, electronics, robotics, biomedical engineering and electrical power systems. We maintain strong links with engineering professionals to ensure our programs remain at the leading edge of professional practice. We have a vibrant research culture, with major research areas in communications & RF identification, intelligent robotics, biomedical engineering and power electronics & energy. For more information about us, please visit our website.

About the research project:
This project is funded by the Australian Renewable Energy Agency (ARENA) and supported by several leading industry players, i.e., Australian Energy Market Operator, AusNet Services, and ABB. This project will assist both network owners and operators to ensure customers get the maximum value of renewable energy farms located in weak parts of the grid. It will also increase the reliability and security of the grid in such areas.

This project aims to address the most immediate needs of the Australian National Electricity Market (NEM) by identifying and classifying stability issues that can occur when renewable energy farms are integrated into weak electricity networks and proposing solutions to these issues. This understanding will support grid operators, planners and connected businesses as they face the challenges of transition currently underway.

The project aims to:

- Classify and describe stability issues that are likely to be expected for wind/solar farms connected to weak grids
- Identify grid properties/value-range/scenarios under which above issues are likely to be encountered
- Propose add-on solutions to wind/solar farms integrated into weak grids to enable/enhance their stability upon various contingencies in the network
- Propose innovative allocation, sizing, and control strategies for grid-strengthening assets such as grid forming inverters and SynCons

The expected project outcomes are:

1. Increased penetration of solar/wind farms in particular in weak parts of the networks unlocking future investments
2. Maximised generation capacity of existing wind/solar farms located in weak parts of the grid, and
3. Increased reliability/security/stability of the grid as the renewable energy penetration grows

POSITION PURPOSE

A Level A research-only academic is expected to contribute towards the research effort of the university and to develop their research expertise through the pursuit of defined projects relevant to the particular field of research.

The Research Fellow is expected to support various tasks of this innovative research project in the context of grid integration of renewable energy resources into weak areas of the electricity grid, including but not limited to; weak grid classifications; test bed development in PSCAD/PSSE; control/optimisation of power electronic-connected assets (in particular, grid-forming inverters); and SynCons in weak power systems.

Reporting Line: The position reports to the Chief Investigator

Supervisory Responsibilities: Not applicable

Financial Delegation: Not Applicable

Budgetary Responsibilities: Not Applicable

KEY RESPONSIBILITIES

Specific duties required of a Level A research-only academic may include:

1. The conduct of research under limited supervision either as a member of a team or, where appropriate, independently and the production or contribution to the production of conference and seminar papers and publications from that research

2. Involvement in professional activities including, subject to availability of funds, attendance at conferences and seminars in the field of expertise

3. Limited administrative functions primarily connected with the area of research of the academic

4. Development of a limited amount of research-related material for teaching or other purposes with appropriate guidance from other staff

5. Occasional contributions to teaching in relation to their research project(s)

6. Experimental design and operation of advanced laboratory and technical equipment or conduct of advanced research procedures

7. Attendance at meetings associated with research or the work of the organisational unit to which the research is connected and/or at departmental, school and/or faculty meetings and/or membership of a limited number of committees

8. Advice within the field of the staff member's research to postgraduate students

9. Other duties as directed from time to time

KEY SELECTION CRITERIA

Education/Qualifications

1. The appointee will have:

- A doctoral qualifications in Electrical Engineering with a focus on power and control engineering

Knowledge and Skills

2. Strong knowledge of various EMT and RMS simulation platforms for power engineering such as PSCAD and PSSE

3. Solid background in power electronic converter control, power systems, and/or control systems

4. Demonstrated analytical and manuscript preparation skills; including a track record of refereed research publications

5. Ability to solve complex problems by using discretion, innovation and the exercise diagnostic skills and/or expertise

6. Well-developed planning and organisational skills, with the ability to prioritise multiple tasks and set and meet deadlines

7. Excellent written communication and verbal communication skills with proven ability to produce clear, succinct reports and documents

8. A demonstrated awareness of the principles of confidentiality, privacy and information handling

9. A demonstrated capacity to work in a collegiate manner with other staff in the workplace

10. Demonstrated computer literacy and proficiency in the production of high level work using software such as Microsoft Office applications and specified University software programs, with the capability and willingness to learn new packages as appropriate

OTHER JOB RELATED INFORMATION

- Travel to other campuses of the University may be required
- There may be a requirement to work additional hours from time to time
- There may be peak periods of work during which taking of leave may be restricted

GOVERNANCE

Monash University expects staff to appropriately balance risk and reward in a manner that is sustainable to its long-term future, contribute to a culture of honesty and integrity, and provide an environment that is safe, secure and inclusive. Ensure you are aware of and adhere to University policies relevant to the duties undertaken and the values of the University. This is a standard which the University sees as the benchmark for all of its activities in Australia and internationally.