

Research Report

**DEPARTMENT OF
ELECTRICAL ENGINEERING**



**VAAL UNIVERSITY
OF TECHNOLOGY**

Inspiring thought. Shaping talent.



JUNE 2023



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Annual Research Report

Faculty of Engineering and Technology

Department of Electrical Engineering

Power Engineering
Computer Systems Engineering
Electronic Engineering
Process Control Engineering

Date: June 2023

Research Coordinator: Dr HM Langa

Introduction

Welcome to the Department of Electrical Engineering. The year 2023 has started positively. It is my pleasure to report our mid-year performance in Electrical Engineering. The total number of Research Units has improved from 2022 and we are proud to announce **8.50 units**.

Our short-term goal is to increase current output by **10%**.

Our long-term goal is to **lead** the Faculty of Engineering and Technology.

Conferences Publications 2023

Output	Units
Ms. SM Balla, Prof JJ Walker and Mr IK Kyere. (2023). Investigating the Effect of Convection on the Rating of Buried Cables Using the Finite Element Method. (19 th South African Power Engineering Conference – (SAUPEC 2023), 24 – 26 January 2023, Johannesburg, South Africa.	0.5
Mr MQ Thekiso, Prof C Nyamupangedengu and Mr IK Kyere. (2023). Simulation of PD Characteristics of Closely Coupled Air Cavities Using MATLAB/SIMULINK. (19 th South African Power Engineering Conference – (SAUPEC 2023), 24 – 26 January 2023, Johannesburg, South Africa.	0.5
Dr K Moloï and Dr HM Langa. (2023). Power Quality Classification Scheme for a Grid-Integrated Power Distribution System. (19 th South African Power Engineering Conference – (SAUPEC 2023), 24 – 26 January 2023, Johannesburg, South Africa.	0.5
Dr K Moloï and Dr HM Langa (2023). Impact of the increasing adoption of small-scale solar photovoltaics on municipal revenue. IEEE AFRICON 2023, Kenya.	0.5
Mr S Sebueng & Dr HM Langa (2023). Evaluation of Improved Transient Behaviour of Single Wire Earth Return under 22 kW Motor Starting Conditions. IEEE AFRICON 2023, Kenya	0.5
Mr IK Kyere and Prof. C Nyamupangedengu. (2023). Effect of Cavities on the Short-term and Long-term Electrical Strength of Polyethylene Insulating Material. IEEE AFRICON 2023, Kenya	0.5
Dr K Moloï and Dr HM Langa (2023). High Impedance Fault Detection Scheme with the Penetration of Distributed Generation. CSC-IEEE 2023, Nigeria	0.5
Dr HM Langa (2023). Using an Electronic Register for Class and Meeting Attendance – Trackie, 10 th Focus Conference, Durban, South Africa.	0.5

Dr K Moloi and Dr HM Langa, (2023). Cost Minimization for a Low cost Household: A South African Case Study. IEEE AFRICON 2023, Kenya	0.5
Ms. DJ Radebe, Mr. IK Kyere and Prof JJ Walker. (2023). The impact of renewable energy sources on voltage compliance with the South African Grid code. IEEE AFRICON 2023, Kenya	0.5
Mr A Osamede and Dr G Sutherland (2023). Design of an Effective Data Logging Interface Circuit for Voltage and Current Measurements in a Basic Off-Grid PV System. Mexico City, Mexico	0.5

Journal Publications 2023

Authors	Title	Journal	Units
Dr K Moloi and Dr HM Langa	A Fault Diagnostic Protection Scheme Technique for A Grid-Integrated Power Distribution System		1.0

Book & Book Chapter Publications 2023

Authors	Title	Publisher	Units
Prof. C Nyamupangedengu	Prof C Nyamupangedengu (2023). Contextualising the Curriculum: A Teacher Educator's Response to Calls for Decolonising the Higher Education Curriculum at a South African University. Bari, Italy 2023	20th Biennial ISATT Conference	2.0

Submitted Conference Papers

Authors	Title & Conference	Conference	Units
Dr HM Langa	Development of an Academic Environment Model.	VUT Teaching and Learning Conference 2023. Vanderbijlpark, South Africa	
Dr SF Phiri and Dr HM Langa	A Notepad and Calculator App for University Students.	10 th Focus Conference 2023. Durban, South Africa	
Dr HM Langa	Revisiting Maslow's Theory	10 th Focus Conference 2023. Durban, South Africa	

Submitted Journal Papers

Authors	Title & Conference	Journal	Units
Dr K Moloi & Dr HM Langa	A Power Quality Based Classification Technique for A Power-Integrated Distribution System	Symmetrix	

Post-Doctoral Fellows

Name	Affiliation / Discipline	Principal Investigator	Date of Appointment
Dr SF Phiri	Power Engineering	Dr HM Langa	01 May 2023
Dr K Moloi	Power Engineering	Dr HM Langa	01 July 2022

Supervisors

Name	Affiliation / Discipline	M	D
Dr T Otunniyi	Computer Systems Engineering	4	2
Prof C Nyamupangedengu	Power Engineering	2	6
Prof A Joubert	Process Control Engineering	1	0
Dr HM Langa	Electrical Engineering	13	0
Prof T Walingo	UKZN	1	
Prof M Ohanga	DUT	0	0
Dr T Sutherland	Electronic Engineering	33	0
Dr T Mathaba	Process Control Engineering	10	0
Dr K Moloi	Power Engineering	0	0
Dr SF Phiri	Power Engineering	0	0
Mr IK Kyere	Power Engineering	3	0
Mr J Djeumen	Power Engineering	1	0
Prof P Bokoro	UJ	0	1
Dr N West	Wits	0	1
Dr A Swanson	UKZN	0	1
Mr A Adeniyi	Power Engineering	1	0

Visiting Scholars

Scholar	Institution	Comments
Dr HM Langa	Landmark University, Omu – Aran, Nigeria	Awaiting a letter of appointment

Student Graduations

Program	Number of Students	Graduation % w.r.t Faculty
Masters	6	22%
Doctoral	0	0%

Conclusion

The Department of Electrical Engineering is certainly making progress in its research efforts.

Dr HM Langa – Research Coordinator