Radar expert Prof Pieter van der Walt remains committed to learning and research excellence

Caption: *Prof Pieter van der Walt (right) engaging in conversation with Prof Nico Koopman at the Faculty of Engineering's 80th anniversary gala*

Throughout his career, Emeritus Professor Pieter (PW) van der Walt from the Department of Electrical and Electronic Engineering at Stellenbosch University (SU) has had education management and research outputs on his radar.

His management contributions and technical leadership have been instrumental in developing radar excellence and boosting research on the topic in South Africa.

Prof Petrie Meyer, acting dean of SU's Faculty of Engineering, sums it up: "Over the years, Prof PW has played a key role in shaping a new generation of engineers.

"His contribution to establishing Reutech Radar Systems [RRS] has been legendary, from the very idea of the company until today." Meyer regards Prof Van der Walt as integral to the success of the technology innovation that has set this company apart.

"During his distinguished career in education and engineering at SU, he has achieved a great deal selflessly, with humility and respect for others. He inspired many undergraduate students to progress to postgraduate studies, which benefited the entire industry."

Early exposure fuels lifelong interest

Prof Van der Walt, who grew up in Cradock and Pretoria, started building amplifiers and sound controls for a local guitar band at a young age.

"My interest in electronics was ignited early on," he says. "I have always been fascinated with building things and understanding how they work. I have basically been interested in filters, radars, and electronics my entire life."

This passion drives his desire to rethink old problems and imagine new solutions, including the innovative use of technology.

"After matric, I joined the South African Air Force and completed a navigation course. At the end of that year, they asked who was interested in studying engineering. I put up my hand and ended up at SU with a bursary.

“Although I did fly during my training, I never flew as a professional navigator. However, navigation school taught me a lot, which proved extremely valuable in my later work.”

A long and varied academic career followed at SU.

Today, he works for some of his former postgraduate students at Reutech Radar Services (RRS) in Stellenbosch. RRS is a division of Reutech (Pty) Ltd, a company in the Reunert Ltd stable (listed on the JSE).

As the first commercial radar company in the country, RRS was established via agreement between Reunert’s Gerrit (Boel) Pretorius, Armscor, and the South African Department of Defence. Prof Van der Walt provided the technical leadership.

Over the last 35 years, the company has grown its research and development capabilities in order to supply a wide range of search and tracking radars, as well as radar components to the national defence force and the international market. Subsequent successes in other areas followed, including adapting the company’s technologies for industrial applications. Today, RRS has over 200 employees and builds radars that are sold internationally. This includes radars for the Norwegian navy, as well as mine radars used in open-cast mines.

Leading the academic pack

Prof Van der Walt started his Maties journey as a student in 1966, after which he became a lecturer in the Faculty of Engineering in 1970. He worked his way up the academic ranks to become a professor in 1980, and later the head of the Department of Electrical and Electronic Engineering.

“I have always loved designing new things and greatly enjoyed lecturing. Those two things have been the core aspects of my working adult life.”

Prof Van der Walt lectured in the Department for three decades (1971–2002).

“In the eighties, one of my former students [Boel Pretorius] asked if I would help set up a radar company. In 1987, I was granted special leave by the University to support the new start-up and later spent a sabbatical at RRS. A few years after my return, I became the dean of the Faculty.”

Prof Van der Walt held this position for nine years (1993–2002) and also served on the University’s Council until from 2010 until 2018.

During this time, he braced many administration and institutional storms, including the negotiation of staff salary increases as chairman of the Lecturer’s Association. “I remember we had a huge fight with [the late rector] Prof Mike de Vries and eventually secured an 18% increase for the staff. That was the first time I almost bankrupted the University,” he banters.

“I worked full-time in faculty management. A dean is a Janus with two faces. He serves both the faculty and the university’s administration. As an administrator, you must operate in both spaces and ensure a balance [of interests].”

Promoting research at SU

Prof Van der Walt was at the helm in the Faculty when a strong focus on research outputs emerged within the University. This change was initiated in the 1980s by the then rector, late Prof Mike de Vries. His successor, Prof Andreas van Wyk, continued to highlight research outputs, and this became part of the mainstream academic environment at Maties.

“At the time, the focus was on lecturing, teaching, and learning,” Prof Van der Walt recalls. “We also had a tradition of working with industry partners. The late Prof Christo Viljoen started an electronics institute that provided us with a channel for doing this type of collaborative work. Many research projects came in, but you did them after hours in your private capacity. We didn’t have a publication culture.”

The eighties and nineties constituted a period of rapid transition for SU from being primarily an institution for teaching to one playing a leading role in research. “My job was to promote a research culture among our staff,” Prof Van der Walt says. “This happened at the same time as many other changes that were underway within the University and the country. These changes necessitated a considerable culture change.”

One of the first things he did was to get internal communication systems going. “In 1993, over half of our engineering staff didn’t even have an email address. Can you believe it? Many people resisted the request. We persisted and got a faculty-wide network to ensure optimal staff communication.”

Prof Van der Walt also implemented an incentive system to reward engineering staff for publishing their research. “This move was initially met with resistance,” he recalls. “This is not the kind of thing you can change in a day or even a year. It takes decades to change institutional culture.

“Since my involvement with the lecturers’ association gave me a good background in performance evaluation, I established a system of performance appraisals within the Faculty. The system we implemented looked at your research footprint, considering what was published and the research strategy used. Is the research sustainable? Is it a flash in the pan one-person show, or a collaboration with others? What is the social impact of your research? These were the kind of questions we asked and hoped our researchers would take to heart.”

Prof Van der Walt believes that these and other efforts to build research outputs laid the groundwork for the Faculty’s current academic strength and standing within the engineering community, both locally and abroad.

“The Faculty is now recognised as a competent player, and the industry invests heavily in our research efforts, showing that our partners value our outputs. I am proud to say that I played a small role in promoting research in the Faculty.”

Prof Van der Walt officially retired in 2002 but still works closely on research projects with some of his former colleagues. He is now involved in designing and constructing radar systems at RRS, and enjoying every minute of it. He considers himself “extremely fortunate” to be working with his former students and in a field and on a topic that he is passionate about.

“At Reutech, my research gained momentum again,” he says. “We do the [radar] design, and subcontractors produce the components. We then put it all together on Reutech’s premises in Technopark, and dispatch these systems worldwide.”

Over the years, the company’s research and development capabilities have grown significantly, enabling it to supply the industry with a wide range of search and tracking radars and associated technologies.

Engineering for the future

Many agree that practitioners in traditional engineering fields such as electronic engineering will remain in demand, but that the nature of their work and the education they require will change.

Prof Van der Walt says engineers will need to become more interdisciplinary and increasingly flexible to leverage and adapt to constantly emerging new technologies, particularly those related to artificial intelligence and data science.

“Engineers must commit to lifelong education to ensure our work stays relevant.

“As an engineer, you learn the language of natural laws and although you use specific technology, the underlying [engineering] principles remain the same. I experienced this first-hand when I left the University and started working in the industry after not researching my field for almost a decade while I was responsible for university administration.

“After flying a desk for 10 years at the University, the RRS team threw me in at the deep end and gave me the design responsibility for a new synthesiser. During the past decade, there had been a revolutionary change in the data books, but not a single engineering principle had changed.

“My conclusion is that a good education lasts a lifetime. We don’t need to overdo teaching new technologies to students, but we do need to expose them to it, all while cementing the principles so that they can apply them in new and innovative ways.”