



ASSET CARE RESEARCH GROUP **PROSPECTUS**

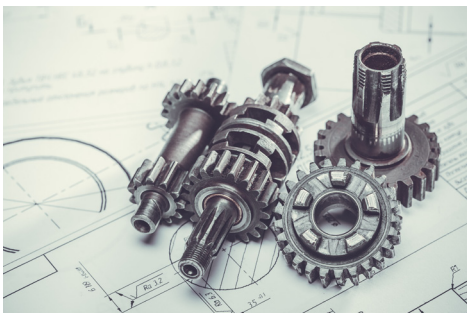
Department of Industrial Engineering
Stellenbosch University



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“ The scientific man does not aim at an immediate result. He does not expect that his advanced ideas will be readily taken up. His work is like that of the planter – for the future. His duty is to lay the foundation for those who are to come, and point the way. He lives and labours and hopes. ”

*Nikola Tesla. "Radio Power Will Revolutionize the World"
in Modern Mechanics and Inventions (July 1934)*



CONTENTS

- 4 Introduction
- 5 Postgraduate Research Programme in Physical Asset Management
 - The Importance of Physical Asset Management
 - Research-based Programme in Physical Asset Management
 - Programme Objectives
 - Programme Structure
 - Admission Requirements and Research Opportunities
- 7 Asset Care Research Group Footprint
 - Building Human Capital
 - Graduated Students
 - Industry Collaboration
 - Training: AM Short Course
 - Research Outputs

INTRODUCTION

The Asset Care Research Group (ACRG) was established in 2011 as a research focus area within the Faculty of Engineering's Department of Industrial Engineering at Stellenbosch University. The industry driven need by the publication of *Publicly Available Specification 55 (PAS 55)* and the then planned ISO 55000 Standard for Asset Management, called for an improved understanding of the management of physical- and its related assets.



Against this background practitioners of Physical Asset Management (AM) have come to realise that the AM body of knowledge has matured to a level where the sharing of knowledge and collaboration between academia and industry have become a greater requirement, than for organisations to guard knowledge for competitive purposes. This requirement was the underlying motivation for establishing a focused research group – the Asset Care Research Group.

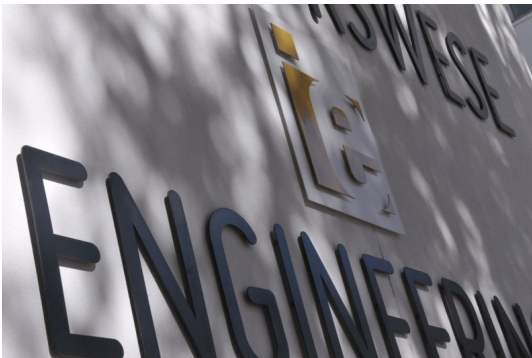
The aim of the ACRG is to provide a premium research destination for postgraduate thought leadership in AM. The purpose for achieving the aim is firstly, to create new AM knowledge, which is not only novel for advancing the AM body of knowledge, but which is also acquainted with industry's current AM challenges; and secondly, to build human capital by providing a research environment for students to become subject matter experts with the ability to pioneer the future of AM.

This prospectus presents details about the **Postgraduate Programme in Physical Asset Management** offered at Stellenbosch University and also provides an overview of the ACRG's research activities. In addition it serves as a token of appreciation towards the group's current and past students, without whom the ACRG cannot achieve its purpose.

Whether you are a prospective postgraduate student seeking to become an AM pioneer, or only interested in the ACRG's activities, I hope that you find this prospectus interesting and inspiring.

A handwritten signature in black ink that reads "Wyhan".

Dr Wyhan Jooste, Head of the Asset Care Research Group



Postgraduate Research Programme in Physical Asset Management

The Asset Care Research Group provides an opportunity for prospective postgraduates to specialise in Physical Asset Management by studying for a Masters or Doctoral degree in Industrial Engineering or Engineering Management.

The Importance of Physical Asset Management

AM is about the systematic and coordinated activities through which organisations optimally and sustainably manage their assets over their respective life cycles. AM is not only about doing things to assets, but more so about extracting value from the assets to achieve the organisation's business objectives. AM is therefore multifaceted considering the strategic, tactical and operational aspects of an organisation's portfolio of assets.

AM has become considerably important in the modern economy. Higher performance demands are placed on physical assets, such as equipment and infrastructure, while there are business and regulatory pressures to lower costs, risks and operate assets in a health conscious, safe, environmentally and socially sustainable manner.

To support industry in managing physical assets these

challenges have led to the release of the ISO 55000 suite of standards and its predecessor PAS 55. Criticism of both these standards is that they provide guidance about "what" to do, but not about "how" to execute the guidelines. This has led to various developments such as the establishment of the Global Forum on Maintenance and Asset Management (GFMAM), defining the 39 asset management subjects and other asset management institutes which have developed custom models based on input from their member bases.

Globally AM practitioners are pursuing ISO 55000 compliance and practical guidance for extracting the value which AM has to offer. The need is however to pioneer methods, processes and technology applications to support AM activities horizontally across organisational activities and to support management vertically throughout the organisational hierarchy.

Research-based Programme in Physical Asset Management

With AM developments over the past decades more and more practitioners of AM have come to realise that the body of knowledge in the field has matured to such a level that there is diminished benefit in guarding this knowledge in an attempt to gain a competitive advantage. The AM fraternity has accepted that the sharing of knowledge and collaboration will ultimately advance the field.

The ACRG was founded in 2011 with its focus areas being: to standardise, broaden, deepen and disseminate knowledge about AM. Since its inception the ACRG has established itself as a premium research destination for postgraduate AM thought leadership with a

comprehensive portfolio of research outputs and activities.

Based within the Faculty of Engineering and forming part of the Department of Industrial Engineering at Stellenbosch University the ACRG provides an opportunity for prospective graduates to specialise in the field of AM.

The M.Eng and PhD programmes with specialisation in Physical Asset Management are specifically aimed at thought leading individuals who wish to distinguish themselves amongst their peers as pioneers of and contributors towards the global AM body of knowledge.

Programme Objectives

The primary objective of this postgraduate programme is specialisation within a specific area of AM in order to become a subject matter expert. It is aimed at individuals who are already established and capable AM engineers who wish to distinguish themselves from their peers, as well as the next generation of AM thought leaders who will spearhead the future of AM.

The M.Eng programme is a research based programme, which requires the successful completion of a comprehensive thesis with an element of supplementary course work¹, while the PhD programme has no course work and only requires the completion of a dissertation.

The programme is not intended for students who wish to study a structured modular-based postgraduate programme for gaining knowledge in a wide array of AM subjects. For such training needs there are various tertiary and industry based service providers accredited by the Southern African Asset Management Association (www.saama.org.za).

Programme Structure

The Masters and Doctoral programme options are to enrol for an M.Eng or PhD either in Industrial Engineering or in Engineering Management at the Department of Industrial Engineering at Stellenbosch University.

The choice between the study domains of Industrial Engineering and Engineering Management depends on the prospective student's preference. The former requires a stronger focus on the optimisation of AM processes and systems by using quantitative methods, while the latter has a stronger focus on management and decision making through the application of engineering principles to business and AM practices.

The M.Eng programme is on a National Qualifications Framework (NQF) level 9 and has a credit value of 180 South African Qualifications Authority (SAQA) credits. The credits translate to 1800 notional hours of study and would therefore require 18-24 months of full-time study. For part-time study 24-36 months would normally be required.

The PhD programme is on NQF level 10 and has a credit value of 360 SAQA credits. The credits translate to 3600 hours of study and would therefore require at least 36 months' study on a full-time basis. For part-time study a longer period would normally be required.

Admission Requirements and Research Opportunities

For more information about admission requirements and procedures visit www.ie.sun.ac.za/prospective-postgraduates/.

For more information about research opportunities as part of the ACRG visit www.ie.sun.ac.za/research/physical-asset-management/ or contact Dr Wyhan Jooste (wyhan@sun.ac.za).

¹ Course work is necessary to calibrate backgrounds and ensure common standard in research practices.

Asset Care Research Group Footprint

The ACRG is living up to its aim through achieving its purpose of building human capital and advancing the AM body of knowledge. The ACRG footprint is an overview of the group's achievements to date.

Building Human Capital

The discipline of AM has evolved rapidly over the last two decades and this growth is providing various job and career opportunities for individuals with postgraduate qualifications in AM from Stellenbosch University.

The ACRG is equipping postgraduates to become pioneers in industry who are highly sought after in the local and international AM markets.



WIEHAHN CARSTENS

Wiehahn holds a B.Eng degree in Mechanical Engineering and a MSc.Eng degree in Industrial Engineering, both from Stellenbosch University. He completed his MSc. Eng degree as a member of the ACRG. *"The ACRG exposes students to cutting edge AM research and acts as a platform to connect with industry focusing on solving real industry problems"*, says Wiehahn. After completing his Masters degree, Wiehahn started his career as an international AM consultant and is currently completing a full-time Master of Business Administration degree at the University of Cape Town.



PETRUS SWART

Petrus Swart completed his M.Eng degree as a member of the ACRG. His thesis research focused on the development of an asset investment decision framework to prioritise shutdown maintenance tasks. *"Being part of the ACRG has helped my thesis and career tremendously. Firstly, it introduced me to asset management's body of knowledge, and secondly it helped me gain invaluable practical experience by connecting me with industry partners to test my thesis hypothesis"*, says Petrus. Now, as a management consultant at Gaussian Engineering, Petrus uses both his acquired theoretical and practical knowledge in international projects in the mining and consumer packaged goods industries.



MILANDI VAN HEERDEN

Milandi van Heerden, holds a B.Sc degree in Food Science, a Postgraduate Diploma in Industrial Engineering and an M.Eng degree in Engineering Management all from Stellenbosch University. Milandi's thesis was about a grounded theory based approach for integrating asset management with total quality management in the South African food industry. Her thesis served as guideline for managers in the food industry to combine their current food quality and safety systems with an asset management system to gain overlapping benefits. *"The ACRG allowed me to explore the possibilities of combining two different research fields, such as food science and engineering, and to contribute to the body of knowledge of both these fields"*, says Milandi. Milandi joined PSG Konsult Ltd in 2016 as an analyst conducting operational data analysis and optimisation of processes and systems.



COMPTON SAUNDERS

Compton Saunders graduated from Stellenbosch University with a B.Eng in Electrical and Electronic Engineering and is a professionally registered engineer with the Engineering Council of South Africa. He started his career in the financial services sector and the information technology industry. While busy with his Post Graduate Diploma in Renewable Energy he joined the management team at Globeleq South Africa Management Services and commenced with his M.Eng in Engineering Management from Stellenbosch University. *"As part of the ACRG I specifically focused on how to manage asset care plans aligned with the ISO 55000 standard within a portfolio of renewable energy plants. My master's work has enabled me to gain knowledge and insights within the discipline of asset management and as a result I am currently developing and implementing the first ISO 55000 compliant asset management system within the renewables industry in South Africa",* says Compton.





JAN-HENDRIK BAUM

After completing his B.Eng degree in Industrial Engineering in Hamburg, Germany Jan-Hendrik continued with his postgraduate studies by studying for an M.Eng in Engineering Management as part of the ACRG at Stellenbosch University. *“My research focused on how to use social network analysis for addressing the constraints for executing asset management strategy. The experience I acquired as part of the ACRG provided me with a basis for my career as a consultant with Staufen AG, one of the leading international lean consulting organisations in Germany, with whom I have been working since 2014. During my time at Staufen I have been responsible for multiple lean projects in assembly and logistics systems with clients from the medicine technology and the mechanical engineering industries. Also I have built on my core competence in Total Productive Maintenance (TPM) and assisted various clients to increase Overall Equipment Effectiveness of machines and production processes”,* says Jan-Hendrik.



LARA KRIEGE

Lara holds a B.Eng degree in Industrial Engineering from the Rosenheim University of Applied Sciences in Germany. After graduating from Stellenbosch University with an M.Eng in Engineering Management, Kriege, joined Jacobs United Kingdom as an asset management consultant in the rail sector. She works with various rail clients in the UK to support them in developing long-term strategies to manage their physical assets. During her masters she was part of the ACRG, where her research focused on the significance of the human dimension in the engineering centric discipline of asset management. *“While my research taught me all the fundamentals and principles of the technical side of asset management, it also helped me to understand the importance of the people side in technical business disciplines and that human capital is one of the most, if not the most, significant factor in managing assets successfully. Being involved in client work on a day-to-day basis, I experience first-hand how effective management of people can leverage the success of business processes. The ACRG presents students with the opportunity to acquire thorough knowledge in the fast growing field of asset management – this combined with students’ personal interests thus creates a pipeline of qualified people to enter the job market related to the field”,* says Lara.



KYLE LEMMER

Following the completion of his B.Eng in Mechanical Engineering from Stellenbosch University, Kyle enrolled for an M.Eng degree in Engineering Management as part of the ACRG. He currently works at one of SABMiller’s breweries as a packaging line manager. *“My current role involves managing a beer packaging line in its entirety – this include the people-, cost-, sustainability-, delivery-, and quality management – all of which are interlinked with the integrity of machinery and processes on the packaging line. The M.Eng research through the ACRG provides a great opportunity for graduate engineers to gain management knowledge that has proven to be invaluable to me in my current role at SABMiller. The programme has led me to identify opportunities for the company in the form of bridging gaps between technical expertise and management decision-making. Maintenance cost, as one of the cost drivers of overall asset management, proves to be an inevitable significant cost to companies in the FMCG industry. Through my thesis I developed a mathematical modelling approach which assists maintenance managers to ensure that overall costs are optimised – essentially providing a systemic approach for management to apply within most FMCG environments”,* says Kyle.

Graduated Students

	2012	2013	2014	2015	2016	Total	In Progress
MSc.Eng / M.Eng	4	2	5	8	8	27	13
PhD			1	1		2	2
Total	4	2	6	9	8	29	15

Industry Collaboration

The ACRG cannot achieve its aim of being a premium research destination for postgraduate thought leadership without active collaboration with its partners. To ensure its research outputs are relevant, students are encouraged to collaborate actively with industry, government, non-governmental organisations (NGOs) and other research organisations. In support of the ACRG's purpose the group has built working partnerships with various organisations through collaborative projects or are contributing to industry through our part-time students. Some examples of these partnerships are:

ANGLO AMERICAN	GAUSSIAN ENGINEERING	PRAGMA	CONTRIBUTION TO INDUSTRY
<p>The support of Anglo American through their bursary programme exposed students to the asset-intensive mining industry through site visits and making data available for analyses and are apparent from various related research outputs. Some of the most notable research outputs by ACRG graduates in support of the mining industry include: regression analysis of haul truck engine failure data; the estimation of continuous risk of accidents occurring in the mining industry; the development of a decision-making framework for inventory management in this capital-intensive industry; and the development of an asset investment decision framework to prioritise shutdown maintenance tasks.</p>	<p>Gaussian Engineering has been an avid supporter and plays an active role in supporting the ACRG with local and international research opportunities ensuring that its research remains innovative and relevant. Gaussian Engineering further supports the industry training endeavours of the ACRG.</p>	<p>Pragma has a long standing relationship with the Department of Industrial Engineering, supporting under- and postgraduate students with industry applications as well as serving on the department's advisory board. Pragma is passionate about developing human capital in AM and supports the ACRG with a bursary programme. Research outputs realised as a result of this support are: the development of a text identification algorithm for mining failure data from work orders; the development of a model for addressing communication deficiencies between AM collaborators; a technology selection framework for supporting AM systems selection; and asset health monitoring using a trending algorithm.</p>	<p>The ACRG further contributes to industry through a strong part-time student base. Organisations which have directly benefited from having employees affiliated with the ACRG include: South African Navy and Airforce, SABMiller, Medi-Clinic, Globeleq, Transnet, Eskom, Shell Petroleum, Shoprite Group and the Passenger Rail Agency of South Africa (PRASA).</p>

Training: AM Short Course



Objectives

The ACRG provides an annual Physical Asset Management short course. Aligned with the aim of the ACRG, each year's course is designed according to a topical theme which is based on current industry challenges. This provides course-goers with AM knowledge and skills which can be applied in their studies or at their workplace. Examples of previous themes are: *Sustaining Risk Managed Performance* and *The Role of AM in a Constrained Economy*.

Structure

The course follows a flipped classroom approach, where the course-goers use the SUNLearn e-learning platform for pre-classroom preparation, followed by a weeklong classroom contact session in Stellenbosch and its beautiful surrounds. During the week various guest lecturers, who are subject matter experts in their respective fields work with course-goers, through presentations and interactive group work sessions to further develop their AM skills.

Course-goers can either enrol for a Certificate of Attendance or for a Certificate of Competence. The latter requires the writing of an examination to assess the internalisation of the coursework and an applied project where course-goers use their newly found knowledge and skills to address an AM problem in industry.

Accreditation

The short course is accredited for Continual Professional Development (CPD) credits with the Southern African Asset Management Association (SAAMA) and the Engineering Council of South Africa (ECSA) and is on a National Qualifications Framework (NQF) level 8.

Admission Requirements

The course is open to AM practitioners from industry and to students, whereby a learning environment is created where students gain exposure to the real challenges in industry and where practitioners from industry are exposed to the latest thinking and research in AM for solving industry challenges.

For more information about the short course and the next starting dates, contact Dr Wyhan Jooste (wyhan@sun.ac.za)

Research Outputs

Journal Articles

Al Shaalane, A. and Vlok, P.J. (2013). Application of the aviation derived maintenance free operating period concept in the South African mining industry. *South African Journal of Industrial Engineering*, 24(3):150–165

Baum, J.H. and Vlok, P.J. (2013). Mapping primary constraints in physical asset management strategy execution, using social network analysis. *South African Journal of Industrial Engineering*, 24(2):47–58

Campher, C.A. and Vlok, P.J. (2013). Building a scenario based active mapping investment tool within a physical asset management framework. *South African Journal of Economic and Management Sciences*, 17(2):194–206

Carstens, W.A. and Vlok, P.J. (2013). Statistical analysis of Caterpillar 793D haul truck engine data and through-life diagnostic information using the proportional hazards model. *South African Journal of Industrial Engineering*, 24(2):59–68

Bam, W.G. and Vlok, P.J. (2014). Optimising investment in asset management using the multivariate asset management assessment topography. *South African Journal of Industrial Engineering*, 25(2):29–38

Minnaar, J.R., Basson, W. and Vlok, P.J. (2013). Quantitative methods required for implementing PAS 55 or the ISO 55000 series for asset management. *South African Journal of Industrial Engineering*, 24(3):98–111

Van den Honert, A.F., Schoeman, J.S. and Vlok, P.J. (2013). Correlating the content and context of PAS 55 with the ISO 55000 series. *South African Journal of Industrial Engineering*, 24(2):24–32

Burnett, S. and Vlok, P.J. (2014). A simplified numerical decision-making methodology for physical asset management decisions. *South African Journal of Industrial Engineering*, 25(1):162–175

Du Toit, D. and Vlok, P.J. (2014). Supply chain management: A framework of understanding. *South African Journal of Industrial Engineering*, 25(3):25–38

Schoeman, J.S. and Vlok, P.J. (2014). The possible influence of risk management, forecasting, and personnel training in physical asset management. *South African Journal of Industrial Engineering*, 25(2):96–104

Van den Honert, A.F. and Vlok, P.J. (2014). Adapting modern portfolio theory for prioritising asset care planning in industry. *South African Journal of Industrial Engineering*, 25(1):107–116

Von Petersdorff, H.A. and Vlok, P.J. (2014). Prioritising maintenance improvement opportunities in physical asset management. *South African Journal of Industrial Engineering*, 25(3):154–168

Conradie, P.D.F., Fourie, C.J., Vlok, P.J. and Treurnicht, N. (2015). Quantifying system reliability in rail transportation in an ageing fleet environment. *South African Journal of Industrial Engineering*, 26(2):128–142

Jooste, J.L. and Vlok, P.J. (2015a). A decision support model to determine the critical success factors of asset management services. *South African Journal of Industrial Engineering*, 26(1):27–43

Schoeman, J.S. and Vlok, P.J. (2015). Estimating residual life of equipment using subjective covariates. *R&D Journal*, 31:52–59

Van den Honert, A.F. and Vlok, P.J. (2015). Estimating the continuous risk of accidents occurring in the mining industry in South Africa. *South African Journal of Industrial Engineering*, 26(3):71–85

Van Heerden, M.A. and Vlok, P.J. (2015). Proposing a holistic physical asset management strategy to implement in food and beverage industries in South Africa. *Journal of Food Science and Quality Management*, 35:83–98

Swart, P.D., Vlok, P.J. and Jooste, J.L. (2016). Broadening the influence of asset managers through the six principles of persuasion. *South African Journal of Industrial Engineering*, 27(2):72–80

Proceedings International

Blaine, PG., Vlok, PJ. and Dobson, RT. (2012). The practical application of ISO 9001 and ISO/TS16949 to the mass production of motor industry components. In Proceedings of the International Conference on Computers & Industrial Engineering (CIE 42), pages 1047–1057. CTICC, Cape Town, South Africa

Flynn, JR. and Vlok, PJ. (2015). Lean approaches in asset management within the mining industry. In Amadi-Echendu, J., Hoohlo, C. and Mathew, J., editors, 9th WCEAM Research Papers, Lecture Notes in Mechanical Engineering, pages 101–118. Springer International. Pretoria, South Africa

Jooste, JL. and Vlok, PJ. (2015b). Identifying the critical success factors for engineering asset management services – An empirical study. In Amadi-Echendu, J., Hoohlo, C. and Mathew, J., editors, 9th WCEAM Research Papers, Lecture Notes in Mechanical Engineering, pages 397–414. Springer International. Pretoria, South Africa

Kriege, L. and Vlok, PJ. (2015). Human resources within ISO 55000 – The hidden backbone to the asset management system. In Amadi-Echendu, J., Hoohlo, C.

and Mathew, J., editors, 9th WCEAM Research Papers, Lecture Notes in Mechanical Engineering, pages 435–446. Springer International. Pretoria, South Africa

Swart, PD. and Vlok, PJ. (2015). Failure statistics: Budgeting preventive maintenance activities using forecasted work orders. In Amadi-Echendu, J., Hoohlo, C. and Mathew, J., editors, 9th WCEAM Research Papers, Lecture Notes in Mechanical Engineering, pages 321–338. Springer International. Pretoria, South Africa

Theron, E. and Vlok, PJ. (2015). Research and development: Driving innovation in a declining mining industry. In Amadi-Echendu, J., Hoohlo, C. and Mathew, J., editors, 9th WCEAM Research Papers, Lecture Notes in Mechanical Engineering, pages 363–377. Springer International. Pretoria, South Africa

Walker, EJ. and Vlok, PJ. (2015). Scheduled shutdowns as an incubator for inefficiencies. In Amadi-Echendu, J., Hoohlo, C. and Mathew, J., editors, 9th WCEAM Research Papers, Lecture Notes in Mechanical Engineering, pages 339–350. Springer International. Pretoria, South Africa

Proceedings National

Nyanga, L., van der Merwe, AF., Vlok, PJ., Mutingi, M. and Matope, S. (2013). Development of a resource agent for an e-manufacturing system. In 25th Annual Southern African Institute for Industrial Engineering Conference, pages 542–1 to 542–14. Spier, Stellenbosch, South Africa

Botha, LJ. and Vlok, PJ. (2014). Mitigating delays in the operations of a business entity when converting to the ISO 55000 standard. In 26th Annual Southern African Institute for Industrial Engineering Conference, pages 1232-1 to 1232-14. Glenburn Lodge, Muldersdrift, Pretoria, South Africa

Heyns, JH. and Vlok, PJ. (2014). Correlation and causation: A potential pitfall for efficient asset management. In 26th Annual Southern African Institute for Industrial Engineering Conference, pages 1234–1 to 1234–12. Glenburn Lodge, Muldersdrift, Pretoria, South Africa

Doctorates

Jooste, JL. (2014). A critical success factor model for asset management services. PhD (Industrial Engineering), Stellenbosch University. pp. 433. Supervisors: PJ Vlok and CSL Schutte

Stimie, JE. (2015). A physical asset management strategy execution enforcement mechanism for the early detection and management of physical asset management strategy execution failure. PhD (Industrial Engineering), Stellenbosch University. pp. 495. Promotors: PJ Vlok and AC Brent

Masters

Al Shaalane, A. (2012). Improving asset care plans in mining: Applying developments from aviation maintenance. MSc.Eng (Engineering Management), Stellenbosch University. pp. 178. Supervisors: PJ Vlok and CSL Schutte

Baum, JH. (2012). Investigating social network analysis as a method to map primary constraints in physical asset management strategy execution. MSc.Eng (Engineering Management), Stellenbosch University. pp. 241. Supervisors: PJ Vlok and CSL Schutte

Campher, CA. (2012). Exploring real options in the capital budgeting of investment within physical asset management. M.Eng (Engineering Management), Stellenbosch University. pp. 179. Supervisors: PJ Vlok and CSL Schutte

Carstens, WA. (2012). Regression analysis of Caterpillar 793D haul truck engine failure data and throughlife diagnostic information using the proportional hazards model. MSc.Eng (Industrial Engineering), Stellenbosch University. pp. 151. Supervisors: PJ Vlok, CSL Schutte and T Visser

Burnett, S. (2013). A simplified numerical decision-making toolbox for physical asset management. MSc. Eng (Industrial Engineering), Stellenbosch University. pp. 198. Supervisors: PJ Vlok and CSL Schutte

Von Petersdorff, HA. (2013). Identifying and quantifying maintenance improvement opportunities in physical asset management. MSc.Eng (Industrial Engineering), Stellenbosch University. pp. 181. Supervisors: PJ Vlok and CSL Schutte

Du Toit, D. (2014). Decision-making framework for inventory management of spare parts in capital-intensive industries. MSc.Eng (Industrial Engineering), Stellenbosch University. pp. 171. Supervisors: PJ Vlok

Truter, AW. (2014). A cost optimisation of preventative upkeep network using the South African Navy as a case study. MSc.Eng (Engineering Management), Stellenbosch University. pp. 218. Supervisors: PJ Vlok

Van den Honert, A. (2014). Estimating the continuous risk of accidents occurring in the South African mining industry. M.Eng (Industrial Engineering), Stellenbosch University. pp. 191. Supervisors: PJ Vlok

Botha, LJ. (2015). Identifying quantitative relationships between key performance indicators in support of physical asset management decision-making processes.

M.Eng (Engineering Management), Stellenbosch University. pp. 185. Supervisor: JL Jooste

Greyling, BT. (2015). Applying process mining to analyse business process performance in the physical asset management environment. M.Eng (Engineering Management), Stellenbosch University. pp. 182. Supervisor: JL Jooste

Kriege, L. (2015). A framework for establishing a human asset register for the improved management of people within asset management. M.Eng (Engineering Management), Stellenbosch University. pp. 181. Supervisors: PJ Vlok and JL Jooste

Minnaar, JR. (2015). Developing a framework for identifying and assessing data quality issues in asset management decision-making. M.Eng (Engineering Management), Stellenbosch University. pp. 116. Supervisor: PJ Vlok

Schoeman, JS. (2015). Estimating residual life of equipment using subjective covariates. M.Eng (Engineering Management), Stellenbosch University. pp. 161. Supervisor: PJ Vlok

Stander, JB. (2015). The modern asset: Big data and information valuation. M.Eng (Engineering Management), Stellenbosch University. pp. 166. Supervisor: PJ Vlok and JL Jooste

Swart, PD. (2015). An asset investment decision framework to prioritise shutdown maintenance tasks. M.Eng (Engineering Management), Stellenbosch University. pp. 204. Supervisor: PJ Vlok and JL Jooste

Walker, EJ. (2015). Motivating human assets in the field of physical asset management. M.Eng (Engineering Management), Stellenbosch University. pp. 180. Supervisor: PJ Vlok and JL Jooste

Basson, W. (2016). Risk management solutions flow to implement quantitative methods as part of ISO 55000 for physical asset management. M.Eng (Industrial Engineering), Stellenbosch University. pp. 198. Supervisors: PJ Vlok and JL Jooste

Flynn, JR. (2016). A business process reengineering framework using the analytic hierarchy process to select a traceability technology for spare parts management in capital-intensive industries. M.Eng (Engineering Management), Stellenbosch University. pp. 278. Supervisors: PJ Vlok and JL Jooste

Theron, E. (2016). An integrated framework for the management of strategic physical asset repair and replace decisions. M.Eng (Engineering Management), Stellenbosch University. pp. 250. Supervisors: PJ Vlok and JL Jooste

Van Deventer, L. (2016). A decision support model to identify causes of human error creating information system failure. M.Eng (Engineering Management), Stellenbosch University. pp. 172. Supervisor: JL Jooste

Van Heerden, MA. (2016). A grounded theory approach for integrating asset management with total quality management in South African food industries. M.Eng (Engineering Management), Stellenbosch University. pp. 357. Supervisor: JL Jooste

Zastron, CM. (2016). Improving information reporting in data-intensive organisations by determining individual data presentation preferences. M.Eng (Industrial Engineering), Stellenbosch University. pp. 207. Supervisors: PJ Vlok and JL Jooste

General Presentations

Vlok, PJ. (2011). Equipping future asset engineers to deliver sustainable asset management strategies and plans. In Pragma Thought Leadership Conference. Cape Town, South Africa

Jooste, JL. and Vlok, PJ. (2012). Critical success factors for physical asset management services. In Proceedings of the International Conference on Computers & Industrial Engineering (CIE 42). Cape Town, South Africa

Basson, W. and Vlok, PJ. (2014). Physical asset management adjustments in line with mining on the coastal regions of Southern Africa. In World Conference on Engineering Asset Management 2014 Conference Papers, pages 1–18. Pretoria, South Africa

Zastron, CM. and Vlok, PJ. (2014). Increasing human asset availability by employing a just-in-time and drum-buffer-rope on-site patient scheduling system. In World Conference on Engineering Asset Management 2014 Conference Papers, pages 1–14. Pretoria, South Africa

Pickering, M., Jooste, JL., Coetzee, J., Saunders, C., Schmid, A. and Kroeber, F. (2015). Towards an asset management framework for the wind industry in South Africa. In Windaba. Cape Town, South Africa

Jooste, JL. (2015). Student insights and an asset management prospective. In Anglo American Coal Colloquium. Witbank, South Africa

Magazine Articles

Baum, JH., Fogel, AG. and Vlok, PJ. (2013). Asset management tools for change – social network analysis. Uptime Magazine, June/July:56–61

Jooste, JL. and Vlok, PJ. (2014). The critical success factors for asset management services. Uptime Magazine, Oct/Nov:44–47

Stimie, JE. and Fogel, AG. (2016a). Controlling the silent killers of strategic asset management – Part 1. Uptime Magazine, Dec/Jan:36–40

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Dr Wyhan Jooste

wyhan@sun.ac.za • 021 808 4234

PHYSICAL ADDRESS

Asset Care Research Group
Stellenbosch University
Department of Industrial Engineering
4th Floor Mechanical and Industrial Engineering Building
Joubert Street
Stellenbosch 7600

GPS co-ordinates: 33°55'45.722'S 18°51'54.542'E



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www.linkedin.com/groups/5106248

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