Curriculum Vitae

Prof Francois Malan

1. Personal Details

Surname: Malan

First names: Daniël Francois

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Born: 4 November 1968, Bethlehem, South Africa

Nationality: South African

Languages: English, Afrikaans

Marital status: Married to Marlie, 1 son, Jacques, 1 daughter, Chanel

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2. Academic history and qualifications

1975-1981: Fountains Primary School, Sasolburg, South Africa

1982-1986: Afrikaanse Hoërskool Sasolburg, South Africa
December 1986: Senior Certificate

1987-1991: Rand Afrikaans University, Johannesburg
May 1992: B.Ing (Electrical) (Cum Laude)

1992-1993: Rand Afrikaans University, Johannesburg
September 1993: M.Ing (Electrical) (Cum Laude)

1995-1998: University of the Witwatersrand, Johannesburg
December 1998: Ph.D. (Mining Engineering)

Industry/ Governmental qualifications:	1) Chamber of Mines Strata Control Certificate, 2003, no. 337 2) Chamber of Mines Rock Mechanics Certificate, 2004, no. 393 3) Registered Professional Engineer with ECSA (Engineering Council of South Africa), no 20040274
Publications/ Reports:	26 publications in refereed journals (list attached) 38 publications in conference proceedings (list attached) 1 Booklet and author of chapters in two other books Co-editor: Proceedings: 2008 Ground Support Symposium Large number of rock engineering consultancy reports on monitoring projects, bord and pillar layouts and numerical modeling of these layouts. A number of publications on numismatics.
Management courses:	Leaders and Leadership, Groman, 1997 CSIR Advanced Leadership Programme (ALP), 1999

3. Professional Affiliations and Appointments

Member - South African National Institute of Rock Engineering (SANIRE)
Member - South African Institute of Mining and Metallurgy (SAIMM)

2001 - 2003	Vice-president, South African National Institute of Rock Engineering (SANIRE)
2003 -2005	President, South African National Institute of Rock Engineering (SANIRE)
2005-2007	Immediate Past President, South African National Institute of Rock Engineering (SANIRE)
2007-2011	Vice President and Board member, International Society of Rock Mechanics (ISRM)
2010	Appointed as Extraordinary Professor at the University of Pretoria
2012	Appointed as Honorary Associate Professor at the University of the Witwatersrand

4. Awards and Recognition

1990:	Rand Pioneers prize for best student in electronics
1992:	Faculty prize for best student in Electrical Engineering
1997:	Salamon prize for best paper in Rock Mechanics
1998:	South African Institute of Mining and Metallurgy silver medal
1998:	CSIR Outstanding Achiever Award – Team Award, Scientific Excellence, Fracture zone behaviour group

2001: ISRM Rocha Medal for best PhD in the world
2001: CSIR Outstanding Achiever Award: Technical Scientific Excellence
2001: CSIR Outstanding Achievers Award: Presented to Miningtek Management Team, Drive towards KITO and Excellence in Transformation
2008: South African Institute of Mining and Metallurgy silver medal
2008: South African Institute of Mining and Metallurgy gold medal
2009: Stan Kaplan trophy for excellence in Numismatics (The National Numismatic Society of South Africa)
2012: South African Institute of Mining and Metallurgy silver medal
2012: Stan Kaplan trophy for excellence in Numismatics (The National Numismatic Society of South Africa)
2012: Salamon Award for best paper during the period 2011, South African National Institute of Rock Engineering
2015: SANIRE Personality of the Quarter – November 2015

5. Employment

1993 - 1997: Research Engineer
CSIR Division of Mining Technology, Johannesburg

During this period, he worked in the fields of numerical modelling and rock mass behaviour physics. This work mainly focused on research into micro-mechanical rock behaviour, the use of boundary element codes and laboratory models. Extensive expertise was also gained in the time-dependent behaviour of rock. This work involved underground closure monitoring, design of laboratory creep equipment and experiments and numerical simulation of the time-dependent processes.

1997 - 2000: Project Manager
CSIR Division of Mining Technology, Johannesburg

During this period, he was responsible for the managing of a large research project on the fundamental behaviour of the rock mass around deep stopes. The work entailed management of 5 researchers, financial management, invoicing, report writing and regular feedback to the project sponsors. The technical work he conducted during this period included the monitoring of continuous closure behaviour of stopes and using this information as a diagnostic measure of rock mass behaviour.

2000 – 2001 Research Area Manager
CSIR Division of Mining Technology, Johannesburg

His responsibility in this position was the management of a research group consisting of 12 researchers, 8 research projects and a rock testing facility. The budget of this area exceeded R 8 million. Specific duties included administration and financial management of all the projects, dealing with staff issues and liaison with important customers in the mining industry.

2001 – 2004 **Programme Manager : Rock Engineering**
CSIR Division of Mining Technology, Johannesburg

In this position, Dr Malan was responsible for the management of 35 researchers, underground technicians and laboratory personnel. The annual budget of this programme was R 30 million. Reporting to the Director of CSIR Miningtek occurred on a weekly basis. One of the main tasks was the setting of annual budgets and monitoring secured income on a regular basis. Also important in this position was the liaison and lobbying of the various research bodies namely SIMRAC, PlatMine and CoalTech. The programme was divided into 4 main research areas with the 4 Research Area Managers reporting to him on a weekly basis. Further responsibilities include attracting talented researchers into the group and maintaining scientific excellence. As part of the Minintek Management Team, an important role was to ensure the financial health and scientific excellence of the entire Division. During the period October-November 2003, he was also acting Director of CSIR Miningtek.

2004 – 2006 **Principal Consultant**
Groundwork Consulting

To broaden his technical expertise base, he joined Groundwork Consulting in February 2004. Initial tasks involved mine instrumentation work, development of new instrumentation, quality assurance of support products and the use of stope closure measurements as a diagnostic measure of rock behaviour.

2006 – 2010 **Director**
Groundwork Consulting

In March 2006, Dr Malan became Operations Director and was responsible for managing staff, achieving financial targets and managing a number of projects dealing with geotechnical instrumentation, monitoring projects and numerical modeling of mine layouts. Technical responsibilities focused on numerical modelling, interpretation of instrumentation data and writing reports, fall of ground investigations and providing solutions to these falls. Extensive experience was also gained on the design of hard rock room and pillar mines and optimizing pillar sizes in these mines.

2010 – 2011 **Director, Groundwork Consulting and Extraordinary Professor, University of Pretoria**

In August 2010, Dr Malan was appointed as Extraordinary Professor in the Mining Engineering Department to oversee the programme for the post-graduate students involved in MSc and PhD studies. This appointment did not affect his duties at Groundwork as discussed above where he remained as Director.

2011 – 2012 **Senior Consultant Rock Mechanics Manager, Gold Fields Extraordinary Professor, University of Pretoria, Honorary Associate Professor, University of the Witwatersrand**

In October 2011, Prof Malan was appointed as Senior Consultant Rock Mechanics Engineer at Gold Fields. This was the most senior rock engineering position in Gold Fields and he was responsible to oversee the entire rock engineering function of the South African operations. During this period he continued with his duties as Extraordinary Professor at the University of Pretoria and in 2012 was also appointed as Honorary Associate Professor at the University of the Witwatersrand.

2012 – **Senior Rock Engineering Consultant, Sibanye Gold; Extraordinary Professor, University of Pretoria, Honorary Associate Professor, University of the Witwatersrand**

In early 2013, Sibanye Gold was unbundled from Gold Fields and Prof Malan was retained by Sibanye as Senior Rock Engineering Consultant. This is the most senior rock engineering position in Sibanye and he is responsible to oversee the entire rock engineering function of the company. During this period he continued with his duties as Extraordinary Professor at the University of Pretoria and Honorary Associate Professor at the University of the Witwatersrand.

6. Conference Organizing Committees and Keynote Lectures

1) Chairman of the organizing committee: SARES2005, 3rd Southern African Rock Engineering Symposium, October 2005
2) Co-chairman of the organizing committee: 6th International Symposium on Ground Support in mining and Civil Engineering Construction, Cape Town, April 2008
3) Presented a Keynote lecture at the East Australian Ground Control Group symposium and workshop in Brisbane during May 2010
4) Presented a keynote lecture at The Second Australasian Ground Control in Mining Conference in Sydney during November 2010
5) Part of the Organising Committee of the 2nd Southern Hemisphere International Rock Mechanics Symposium, SHIRMS 2012.
6) Presented a keynote lecture at the SANIRE 2012 Symposium – Mechanica Saxorum (25 October 2012)
7) Presented a keynote lecture at the 2015 ISRM Congress – Montreal Canada, May 2015.
8) Invited to give a lecture at the Workshop on International Coal Burst Experience and Research Direction, UNSW, Australia, August 2016.

7. Teaching and other academic experience

1) Presented lectures on the mining of tabular ore deposits to third year engineering geology students at the University of Pretoria (from 1999 to 2003).
2) Presented a number of courses to mining personnel over the years. Examples of these were courses in elasticity theory, rock bolting and courses on statistical methods for the quality assurance of mine support products.
3) Regularly being used a reviewer of rock engineering papers submitted to the Journal of the South African Institute of Mining and Metallurgy.
4) Moderator of the Theory paper (paper 1) for the Chamber of Mines Rock Mechanics Certificate (2009-2010)
5) Part of the responsibility of serving on the ISRM Board was to adjudicate the PhD thesis's submitted for the annual award of the Rocha medal. This

typically involved the reviewing of up to 10 theses and ranking them. This function was fulfilled from 2008 to 2011.

6) Invited to present a two-day course on rock bolting in Lima, Peru during September 2010.
7) In August 2010 appointed as Extraordinary Professor in the Mining Engineering Department at the University of Pretoria.
8) In August 2012 appointed as Honorary Associate Professor in the Mining Engineering Department at the University of the Witwatersrand.
9) Supervised 3 MSc students and 2 PhD students.

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8. Involvement in prominent rock engineering investigations

1) Part of the 2013 investigation team – ZIMPLATS Bihma Mine collapse
2) Requested by the Department of Mineral Resources to assist with the 2016 Lily Mine, South Africa, collapse rescue efforts.

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9. Sport and Hobbies

1) Gym and jogging to keep fit.

2) Numismatics (active Committee Member of the National Numismatic Society of South Africa):

2.1 Presented a paper during the August 2008 meeting of The National Numismatic Society of South Africa entitled: *"Trends in South African coin prices and the role of catalogues"*

2.2 Presented a lecture during the August 2009 meeting of The National Numismatic Society of South Africa entitled: *"Research on the Second Decimal Coin Series – The Cinderella Coins"*

2.3 Wrote a book on the Second Decimal Coin Series of South Africa entitled: "Coins for a Hundred Years" ISBN 978-0-620-54061-2. A second edition of the book was published under the title: "History of the Nickel Coins of South Africa"

2.4 Presented a lecture during the October 2010 meeting of The National Numismatic Society of South Africa entitled: *"Pearls of the research into the 2nd Decimal Coin Series - Discoveries of a 7 year investigation"*.

2.5 Compiled a document in 2014: *"A review of South African Numismatic Research and Literature for the period 1900 – 2014"*.

2.6 Compiled a paper for the South African Reserve Bank in 2015*: "The rights of the South African Reserve Bank with respect to historic coinage"*.

2.7 Currently writing a book on the history of the Krugerrand.

2.8 Compiled a paper in 2016: *"A review of the 20c steel patterns of 1988."*

3) Rock and mineral collecting

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9. References

1. Prof John Napier, Mining Engineering Department, University of Pretoria. Tel no. (011) 783 2611
2. Prof Ronny Webber Youngman, Mining Engineering Department, University of Pretoria. Cell no. 082 556 8077
3. Prof Nielen van der Merwe, Mining Engineering Faculty, University of the Witwatersrand (retired), Cell no. 082 451 4895
4. Mr Peter Turner, Senior Vice President, Sibanye, Cell no. 082 373 2484
5. Dr Guner Gurtunca, Director NIOSH Pittsburgh (retired), Tell: 412 2211064 rggurtunca@verizon.net

10. List of publications

1. Books

Guidelines for measuring and analyzing continuous stope closure behaviour in deep tabular excavations. SIMRAC publication, ISBN 1-919853-10-3, Creda publishers, 2003

Joint author of Chapter 4 Analytic Elasticity and Inelasticity in: Ryder, J.A. and Jager, A.J. A textbook on Rock Mechanics for tabular hard rock mines, Published by SIMRAC, ISBN 0-7988-5547-9, 2002.

Chapter 33 "Stope Closure as a Diagnostic Measure of Rock Behaviour in Deep Level Mines" in the "Deep and high stress mining" book, Editors Y. Potvin, T.R. Stacey, J. Hadjigeorgiou, ISBN 978-0-9804185-1-4, pp. 287-295

Co-editor: 6th International Symposium on Ground Support in mining and Civil Engineering Construction, Cape Town, April 2008

2. Journal publications

Malan, D.F., Lacquet, B.M. and Swart, P.L. Diffusion-limited model of pore formation in non-degenerate n-type silicon. *S. Afr. J. Phys*. vol. 16, pp. 127-130, 1993.

Lacquet, B.M. and Malan, D.F. Emission of visible light from porous silicon during anodic oxidation. *Optical Engineering*, vol. 33 pp. 2898-2902, 1994.

Malan, D.F., Napier, J.A.L. and Watson, B.P. Propagation of fractures from an interface in a Brazilian test specimen. *Int. J. Rock Mech. Min. Sci. & Geomech. Abstr*. vol. 31, pp. 581-596, 1994.

Malan, D.F. and Napier, J.A.L. Computer modelling of granular material microfracturing. *Tectonophysics*, vol. 248, pp 21-37, 1995

Malan D.F. A viscoelastic approach to the modelling of transient closure behaviour of tabular excavations after blasting. *J. S.Afr. Inst. Min. Metall*., vol. 95, pp. 211-220, 1995

Malan, D.F., Vogler, U.W. and Drescher, K. Time-dependent behaviour of hard rock in deep level gold mines. *J. S.Afr. Inst. Min. Metall*, vol. 97, pp. 135-147, 1997.

Napier, J.A.L., Daehnke, A., Dede,T., Hildyard, M.W., Kuijpers, J.S., Malan, D.F., Sellers, E.J. and Turner, P.A. Quantification of stope fracture zone behaviour in deep level gold mines. *J. S. Afr. Inst. Min. Metall*., vol. 97, pp 119-134, 1997.

Napier, J.A.L. and Malan, D.F. A viscoplastic discontinuum model of time-dependent fracture and seismicity effects in brittle rock. *Int. J. Rock Mech. Min. Sci. & Geomech. Abstr*, vol. 34, pp. 1075-1089, 1997.

Siebrits, E., Smit, J.L., Ruther, H. and Malan, D.F. The mapping of blast-induced deformations in deep gold mines by digitial photogrammetry. *Fragblast*, vol. 1, pp. 233-242, 1997.

Malan, D.F. and Basson, F.R.P. Ultra-Deep Mining: The increased potential for squeezing conditions. *J. S. Afr. Inst. Min. Metall*., vol. 98, pp. 353-363, 1998.

Malan, D.F. Time-dependent behaviour of deep level tabular excavations in hard rock. *Rock Mech. Rock Engng*., vol. 32, no. 2, pp. 123-155, 1999.

Bosman, J.D., Malan, D.F. and Drescher, K. Time-dependent tunnel deformation at Hartebeestfontein Mine, *J. S. Afr. Inst. Min. Metall*., vol. 100, no. 6, pp 333-340, 2000.

Malan, D.F. Manuel Rocha Medal Recipient: Simulating the time-dependent behaviour of excavations in hard rock. *Rock Mech. Rock Engng*., vol. 35, no. 4, 2002.

Napier, J.A.L and Malan, D.F. The computational analysis of shallow depth tabular mining problems, *J. S. Afr. Inst. Min. Metall*., vol. 107, pp. 725-742, 2007.

Malan, D.F. Napier, J.A.L and Janse van Rensburg, A.L. Stope deformation measurements as a diagnostic measure of rock behaviour: A decade of research, *J. S. Afr. Inst. Min. Metall*., vol. 107, pp. 743-765, 2007.

Malan, D.F. and Napier, J.A.L. Numerical modelling of tunnel liner and fracture interaction, *J. S. Afr. Inst. Min. Metall*., vol. 108, no. 6, pp. 339-344, 2008.

Malan, D.F., Piper, P.S., Potgieter, G.M. and Du Toit, M. Mine-wide panel stability monitoring at Anglo Platinum Union JV, , *J. S. Afr. Inst. Min. Metall*., vol. 110, no. 1, pp. 35-41, 2010.

Malan, D.F. and Napier, J.A.L. The design of stable pillars in the Bushveld mines: A problem solved? *J. S. Afr. Inst. Min. Metall*., vol. 111, pp 821-836, 2011.

Napier, J.A.L. and Malan, D.F. Numerical computation of average pillar stress and implications for pillar design. *J. S. Afr. Inst. Min. Metall*., vol. 837-846, 2011.

Du Plessis, M., Malan, D.F. and Napier, J.A.L., Evaluation of a limit equilibrium model to simulate crush pillar behavior. *J. S. Afr. Inst. Min. Metall*., vol. 111, pp 875-885, 2011.

Kluge, P. and Malan, D.F. The application of the analytical hierarchical process in complex mining engineering design problems. *J. S. Afr. Inst. Min. Metall*., vol. 111, pp. 847-855, 2011.

Napier, J.A.L. and Malan, D.F. Simulation of time-dependent crush pillar behaviour in tabular platinum mines, *J. S. Afr. Inst. Min. Metall*., vol. 112, pp. 711-719, 2012.

Aydan, O., Ito, T., Özbay, U., Kwasniewski, M., Shariar, K., Okuno, T., Özgenoğlu, A., Malan, D.F., and Okada, T., ISRM Suggested Methods for Determining the Creep Characteristics of Rock, *Rock Mechanics and Rock Engineering*, vol 47, Issue 1, pp 275-290, 2014.

Du Plessis, M. and Malan, D.F., Crush pillar support – designing for controlled pillar failure, *J. S. Afr. Inst. Min. Metall*., vol. 115, pp 481-488, 2015.

Jooste, Y. and Malan, D.F., Rock engineering aspects of a modified mining sequence in a dip pillar layout at a deep gold mine, *J. S. Afr. Inst. Min. Metall*, vol. 115, pp 1097-1112, 2015.

Alejano, L.R., Arzua, J., Castro-Filgueira, U. and Malan, F., Strapping of pillars with cables to enhance pillar stability, Accepted for publication *J. S. Afr. Inst. Min. Metall*, 2016.

3. Publications in conference procedings

Malan, D.F. and Spottiswoode, S.M. Time-dependent fracture zone behaviour and seismicity surrounding deep level stoping operations. In: S.J. Gibowicz and S. Lasocki (ed.) *Proc. 4th Int. Symp. Rockburst and Seismicity in Mines*, Krakow, Poland, pp. 173-177, 1997.

Malan, D.F. and Bosman, J.D. A viscoplastic approach to the modelling of time-dependent rock behaviour at Hartebeestfontein gold mine, In: G.Gürtunca and T.O. Hagan (eds.) *Proc. of the 1st Southern African Rock Mech. Symp*., (SARES97) Johannesburg, pp. 117-130, 1997.

Malan, D.F. Drescher, K. and Vogler, U.W. Shear creep of discontinuities in hard rock surrounding deep level excavations. In: H.P. Rossmanith (ed.) *Proc. Mechanics of Jointed and Faulted Rock 3*, Balkema, pp. 473-478, 1998.

Vogler, U.W., Malan, D.F. and Drescher, K. Development of shear testing equipment to investigate the creep of discontinuities in hard rock. In: H.P. Rossmanith (ed.) *Proc. Mechanics of Jointed and Faulted Rock 3*, Balkema, pp. 229-234, 1998.

Napier, J.A.L., Malan, D.F. and Sellers, E.J. Implications for fracture zone behaviour in deep level gold mines. *Proc. SIMRAC Symp*, Johannesburg, 1998.

Malan, D.F. and Napier, J.A.L. The effect of geotechnical conditions on the time-dependent behaviour of hard rock in deep mines. In: Amadei, B., Kranz, R.L., Scott, G.A. and Smeallie, P.H. (eds.) *37th U.S. Rock Mechanics Symposium*, Vail Rocks '99, pp. 903-910, Balkema, 1999.

Malan, D.F. Implementation of a viscoplastic model in FLAC to investigate rate of mining problems. In: Detournay, C and Hart, R. (eds) *FLAC and Numerical Modelling in Geomechanics, Proc of the Int. FLAC Symp on Num. Modelling in Geomech.*, Minnesota, Balkema, pp. 497-504, 1999.

Malan, D.F. Closure measurements in tabular excavations: Avoiding the pitfalls. In: Hagan, T.O. (ed.) *Proc. of the 2st Southern African Rock Mech. Symp*., (SARES99) Johannesburg, pp. 238-250, 1999.

Bosman, J.D., Malan, D.F. and Drescher, K. Time-dependent tunnel deformation at Hartebeestfontein Mine. In : Stacey, T.R. (ed), Proc. AITES – ITA 2000 – World Tunnel Congress, Tunnels under Pressure, 13-18 May 2000, pp. 55-62, 2000 (reprinted in J. S. Afr. Inst. Min. Metall. vol . 100, no. 6, 2000, pp. 333-340).

Malan, D.F. and Drescher, K. Modeling the post-failure relaxation behaviour of hard rock. In: Girard, J., Liebman, M., Breeds, C., Doe, T. (eds) Proc. 4th North American Rock Mech. Symp., Pacific Rocks 2000., Seattle, pp. 909-917, 2000.

Malan, D.F., Napier J.A.L. and Grave M. Experiments on stope closure as a diagnostic measure of rock behaviour. In: Handley,M and Stacey, D (eds) International Society for Rock Mechanics, 10th congress, Sandton, SAIMM Symposium series S33, pp. 795-801, 2003.

Napier, J.A.L. and Malan, D.F. Solution of shallow depth pillar design problems in tabular mining. In: SARES 2005 3rd Southern African Rock Engineering Symposium, The South African Institute of Mining and Metallurgy, Symposium Series S41, pp. 13-23, 2005.

Malan, D.F., Janse van Rensburg, A.L. and Roberts, D.P. Closure monitoring as a design and risk assessment tool in platinum mines. In: SARES 2005 3rd Southern African Rock Engineering Symposium, The South African Institute of Mining and Metallurgy, Symposium Series S41, pp. 231-243, 2005.

Malan, D.F. and Piper, P.S. Monitoring of rock mass behaviour as a design and hazard assessment tool in underground stopes. In: Golden Rocks 2006, The 41st U.S. Symposium on Rock Mechanics (USRMS): "50 Years of Rock Mechanics - Landmarks and Future Challenges.", Golden, Colorado, June 17-21, 2006.

Malan D.F. and Napier J.A.L. Computational aspects of shallow depth pillar layout design problems in tabular mining, In: Golden Rocks 2006, The 41st U.S. Symposium on Rock Mechanics (USRMS): "50 Years of Rock Mechanics - Landmarks and Future Challenges.", Golden, Colorado, June 17-21, 2006.

Malan D.F. and Napier J.A.L. Practical Application of the Texan Code to Solve Pillar Design Problems in Tabular Excavations", SANIRE Symposium "Facing the challenges", Rustenburg, pp. 55-74, 2006.

Malan, D.F. Rock mass monitoring as a hazard assessment tool in deep Merensky and UG2 stopes. In: Sousa, L. R., Olalla, C. and Grossmann, N.F., Proc. 11th Congress ISRM, Lisbon, Portugal, 9-13 July 2007, pp. 1311-1313, 2007.

Piper, P.S., Malan, D.F. Clements, T.N. and Janse van Rensburg, A.L. The real in-situ performance of prestressed elongates, In: SANIRE Symposium "Redefining the boundaries – Part II" pp. 15-31, 2007.

Piper, P.S. and Malan, D.F. The in-situ performance of elongate support – Myths and Realities, In: Stacey, T.R. and Malan, D.F. (eds.) 6th International Symposium on Ground Support in mining and Civil Engineering Construction, Cape Town, April 2008, pp 299 – 315, 2008.

Malan, D.F. and Napier, J.A.L. Numerical modelling of tunnel liner and fracture interaction, In: Stacey, T.R. and Malan, D.F. (eds.) 6th International Symposium on Ground Support in mining and Civil Engineering Construction, Cape Town, April 2008, pp 91-102.

Napier, J.A.L. and Malan, D.F. Numerical simulation of a multi-reef tabular mining layout in a South African platinum mine, In: Proceedings: SHIRMS2008, 1st Southern Hemisphere Rock Mechanics Symposium, Sept 2008.

Malan, D.F., Piper, P.S., Potgieter, G.M. and Du Toit, M. Mine-wide panel stability monitoring at Anglo Platinum Union JV, In : Proc. 1st Hard Rock Safe Safety Conference, , Sun City, Sept 2009, pp. 175-188.

Malan, D.F. The use of instrumentation to understand rock mass behaviour, In: Rock Engineering for Tabular Mines, SAIMM Mining School, Sept 2010, pp 175-191.

Potgieter, G.S. and Malan, D.F. Preliminary evaluation of the proposed mining method at Eland Platinum Mine. The 4th International Platinum Conference, Platinum in transition'Boom or Bust', The Southern African Institute of Mining and Metallurgy, pp. 345-342, 2010.

Malan,D.F. Keynote Lecture - Pillar design in hard rock mines: Can we do this with confidence? In: Hagan, P and Saydam, S., (eds.) Proc. Second Ground Control in Mining Conference, Sydney, November 2010, pp 15-30, 2010.

Malan, D.F. Recent Developments in the Monitoring of Excavation Stability in South African Mines. In: Qihu, Q and Zhou, Y, (eds.) Proc. 12th ISRM Int. Cong. Rock Mech. Harmonising Rock Engineering and the Environment, pp. 597 – 598, 2011.

Du Plessis, M and Malan, D.F. 2011. A New Approach to Simulate Crush Pillar Behaviour in a Tabular Layout. In: Qihu, Q and Zhou, Y, (eds.) Proc. 12th ISRM Int. Cong. Rock Mech. Harmonising Rock Engineering and the Environment, pp. 581 – 582, 2011.

Maritz, J. and Malan, D.F. The Influence of Shear Stress and Weak Contacts on Pillar Behaviour. In: Qihu, Q and Zhou, Y, (eds.) Proc. 12th ISRM Int. Cong. Rock Mech. Harmonising Rock Engineering and the Environment, pp. 599 – 600, 2011.

Maritz, J.A., Malan, D.F. and Piper, P.S. Estimating pillar stresses in complex multi-reef layouts. In: 2nd Southern Hemisphere International Rock Mechanics Symposium, SHIRMS 2012, pp 125-143, 2012.

Napier, J.A.L. and Malan, D.F., Simulation of time-dependent crush pillar behaviour in tabular platinum mines, 2nd Southern Hemisphere International Rock Mechanics Symposium, SHIRMS 2012, pp 691-713, 2012.

Malan, D.F., and Napier, J.A.L., Recent advances in numerical modeling to simulate on-reef failure processes in deep tabular mines. In: Mine Safe 2013, Johannesburg, SAIMM, 2013.

Napier, J.A.L., and Malan, D.F. A simplified model of local fracture processes to investigate the structural stability and design of large-scale tabular mine layouts. In 48th US Rock Mechanics / Geomechanics Symposium, Minneapolis, USA, 2014.

Du Plessis, M and Malan, D.F., Designing controlled pillar failure – crush pillar support. The 6th International Platinum Conference, 'Platinum–Metal for the Future', The Southern African Institute of Mining and Metallurgy, pp. 339-347, 2014.

Du Plessis, M and Malan, D.F., Evaluation of pillar width on crush pillar behavior using a limit equilibrium solution, In: Alejano, Perucho, Olalla & Jiménez (Eds) Rock Engineering and Rock Mechanics: Structures in and on Rock Masses, Taylor & Francis Group, London, pp. 713-718, 2014.

Malan, D.F. Hard Rock tabular excavations: Historic rock engineering solutions and future challenges, In: Proc. 13 ISRM Congress, Montreal, Canada, 2015.

Du Plessis, M and Malan, D.F., Assessing the behaviour of Merensky reef crush pillars, In: Proc. 13 ISRM Congress, Montreal, Canada, 2015.

Du Plessis, M and Malan, D.F., The behaviour of Merensky crush pillars as measured at a trial mining site, Submitted to Eurock 2016, Capadocia Turkey, August 2016.

Malan, D.F. and Napier, J.A.L., A limit equilibrium fracture zone model to investigate coal bursts, In: Proc Focused Workshop on International coal Burst Experience and Research Direction, UNSW, Sydney, August 2016.