

EXTENDED CURRICULUM VITAE

Last Updated: 16 May 2016

GORDON MAYNARD RIGG

Work Address

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PERSONAL INFORMATION

Surname

Rigg

First Names

Gordon Maynard

Identity Number

6912135222081

Date of Birth

13 December 1969

Sex

Male

Marital Status

Single

Common-law wife. Daughters 24yrs and 15yrs old.

Drivers License

Code 08

Nationality

Dual Citizen (South African & British)

British Passport Number 761262453

South African Passport Number M00041240

Home Language

English

Other Languages

Afrikaans (speak, read, write and understand)

Criminal Offenses

None

Health

Good

EDUCATIONAL QUALIFICATIONS

Last School Attended

Fairmont High School, Durbanville, Cape Province (1983 - 1987)

Highest Standard

Matriculation Passed

Subjects Passed

English, Afrikaans, Mathematics, Physical Science, Biology and Geography

Extra Mural Activities

Surfing (#1), Soccer (1st Team), Hockey, Table Tennis, Tennis

Academic Record

Cape Education Department Senior Certificate available on request

HIGHER EDUCATION

University Attended

University of Cape Town, Private Bag, Rondebosch, Cape Town, 7700, South Africa (1988 - 1995)

Degree Obtained

Bachelor of Science (1990) - Majoring in Environmental and Geographical Science & Ocean and Atmospheric Science

Subjects Passed

Physics (PHY 100W), Chemistry (CEM 102W), Mobile Biology (BOT 103F), Animal Diversity and Evolution (ZOO 103S), Environmental and Geographical Science (EGS 100W), Mathematics (MTH 101F), Principles of Location (EGS 201F), Synoptic Climatology (EGS 206S) Descriptive Physical Oceanography (SEA 200F), Principles of Animal Ecology (ZOO 200F), Ocean and Atmospheric Science (SEA 300W), Biogeography (EGS 303S), Geography of Africa (EGS 305S)

Degree Obtained

Bachelor of Science (Honours) in Ocean & Atmospheric Science (1991)

Distinction

1st Class Pass

Degree Obtained

Bachelor of Science (Masters) in Physical Oceanography (June 1995)

Leadership Roles

Science Student Council (SSC) member in 1991. The primary aim of the SSC was to address academic and social issues faced by Science Students at the University.

Thomas B. Davie Memorial Committee student representative at U.C.T in 1991. The main purpose of this committee was to address academic freedom in South Africa.

Extra Mural Activities

Surfing, Squash, Volleyball (Social), Tennis (Social), Soccer (Social)

Publications

(See attached publication list)

PRESENT EMPLOYMENT

Name of Company

Marine Data Consultants CC

Type of Company

Hydrographic survey and data management consultancy

Post Held

Principal Member (Feb 2006 – Present). Self employed.

Main Job Functions

Marine geophysical and hydrographic surveys. Specialist in multibeam bathymetry surveys. Services include: project management, party chief, client representative, installations and calibrations, acquisition, post-processing and chart production.

Marine data management. Services include database design and implementation, GIS applications, data QC / QA.

Reseller Agencies:

- QPS QINSy, QLOUD and Fledermaus Software. Navigation, multi-sensor acquisition software and 4-D data processing. <http://www.qps.nl/>
- APPLANIX Hardware and Software. <http://www.trimble.com/>
- GEO SYSTEMS Hardware and Software. <http://geomarinesurveysystems.com/>

PREVIOUS EMPLOYMENT

Name of Company

Reson SA (Pty) Ltd

Type of Company

Manufacturer and supplier of Underwater Sonar Systems (hardware and software)

Post Held

Product Support & Resource Development (Feb 2002 – Jan 2006)

Main Job Functions

Installation, maintenance and client support of all Reson products.

Operational training of client personnel to operate and maintain Reson products when required

Hardware and software development of Reson products specific to client requirements

Value-added resource modeling and management for Clients utilizing Reson seabed visualization technology.

Name of Company

Gemfarm Investments (Pty) Ltd

Type of Company

Marine Diamond Mining and Exploration

Post Held

Marine Exploration Head (June 2000 – Jan 2002)

Main Job Functions

Head of a team of 5 marine geologists to identify, prospect and exploit the marine alluvial diamond resources off the Namibian and South African west coasts. Responsible for all geophysical and mining data acquisition, processing, archive, interpretation, mapping, resource modeling and ore reserve management.

Senior fleet manager for 4 large mining vessels whilst at sea (MV Lady-S, MV Anya, MV Spirit of Namibia, MV Shelf Explorer). Responsible for all prospecting and mining activities.

Name of Company

Ocean Diamond Mining SA Limited (ODM) / NAMCO

Type of Company

Marine Diamond Mining and Exploration

Post Held

Marine Geophysics Survey Project Leader (July 1997 – May 2000)

Main Job Functions

To head a team of 5 surveyors on board ODM's survey vessel *SV Halifax*. Responsible for all geophysical data acquisition, processing, archive, interpretation, mapping and presentation of geophysical results.

Senior Manager of ODM's in-house Geophysics Department.

Name of Company

Gal Marine (PTY) LTD

Type of Company

Marine Diamond Mining and Exploration

Post Held

Physical Oceanographer / Marine Geologist / Geophysicist (February 1997 – June 1997)

Main Job Functions

To provide computing support to the Geology Section of Gal Marine. Responsible for all geophysical research, interpretation and mapping of historical geophysical data for the White Sea, Russia.

Reason for Leaving

I was offered an exciting opportunity to head a team of geophysical surveyors for the successful marine diamond mining and exploration company, Ocean Diamond Mining.

Name of Company

Werner Marine Research (PTY) LTD. B36 Sanlam Business Park, Koeberg Road, Milnerton, 7441, Cape Town.

Type of Company

Marine Diamond Exploration

Post Held

Physical Oceanographer / Marine Geologist (March 1996 - February 1997)

Main Job Functions

To provide computing support to the Survey Section of Werner Marine Research. Responsible for all geophysical research and interpretation. Coordination of geophysical surveying results with those results obtained from Werner's Marine Geology Laboratory.

Name of Organization

University of Cape Town / World Wildlife Fund (WWF) Joint Project

Type of Organization

Rock and Surf Angling Monitoring Program from Hermanus to Cape Hangklip

Post Held

Senior Environmental Researcher (February 1995 - March 1996)

Main Job Functions

Appointed to the Line Fish Group, Zoology Department (U.C.T) as the principal researcher in monitoring rock and surf angling between Hermanus and Cape Hangklip. This project was funded by WWF through the Green Trust and was to run for a further two years. The purpose of the project was to estimate present angling pressure along this particular stretch of coast, with a view to establish whether there was a need for a coastal fish reserve in the area. Fish tagging and catch-per-unit-effort estimates were run concurrently, with collaboration with the Oceanographic Research Institute (ORI) in Durban.

Name of Company

SOEKOR. 151 Frans Conradie Drive, Parow, Cape Town, 7500

Type of Company

Offshore Oil Exploration

Post Held

Part-time Student Research Assistant (December 1988 - February 1990)

Main Job Functions

Worked for the Specialist Geology Section at SOEKOR, analyzing drilling-core samples for Foraminifera (Micropalaeontology). Involved in technical drawing and archiving data on computer.

Name of Organization

Ocean Climatology Group. Oceanography Department, University of Cape Town, Private Bag, Rondebosch, Cape Town, 7700.

Type of Organisation

Physical Oceanographic Research of the Deep Ocean.

Post Held

Member of the Ocean Climatology Research Group headed by Prof. J.R.E. Lutjeharms (November 1990 - January 1995).

Main Job Functions

My research interests were primarily concerned with the hydrography and dynamics of mesoscale features of the Agulhas Current and their impact on the surroundings. Much of this research was funded by the Foundation for Research and Development (FRD) and the Department of Environmental Affairs (DEA).

GENERAL

Present Outside Interests

I am actively involved in surfing and fishing. I have been actively surfing for the past 27 years and have been committed to the Sea Fisheries Research Institute (SFRI) fish tagging experiment in the De Hoop Nature Reserve on a part-time basis over the past 10 years.

Skills Applicable to a Career in Marine Survey Industry

Educational Background

I have successfully completed a double-major in Physical Oceanography and Environmental & Geographical Science at the University of Cape Town (B.Sc., 1990). My interest in the marine environment fueled further studies. I completed my B.Sc. (Honours) in 1991 with distinction, and continued my studies to the Masters level, which I completed in June 1995. My understanding of marine, coastal and estuarine systems is excellent. I have adapted my skills to the Marine Diamond, Offshore Oil & Gas, Offshore Renewables, Offshore Cable and Coastal Engineering industries over the past thirteen years. My experience at sea has proved invaluable. I have experience with the acquisition, processing and interpretation of huge volumes of electronic data acquired by CTD's, ADCP, Single and Multi-beam Echosounders, Side Scan Sonar, High Resolution Shallow Seismics (Chirp, Pinger, Ricker, Parametric) and Deep Seismics (Air Gun, Sparker, Boomer).

Technical Ability

During my survey years at ODM/NAMCO and subsequent years at Reson SA and MDC, I have been responsible for the installation and interfacing of the following survey hardware:

- Navigation Systems (DGPS and RTK)
- Motion Sensors (H,P,R and inertial)
- Gyroscopes
- Single-beam echosounders
- Multibeam echosounders
- Side scan sonars
- Sub-bottom profilers (Pinger, Chirp, Parametric, Sparker, Boomer)
- Sound velocity probes
- CTD probes
- Tide Gauges

Computer Literacy

I am computer literate and have had much experience with word processing packages (eg. MS Word, Lotus Word Pro), spreadsheet software (e.g. Lotus, Quattro Pro, Axum, Excel), MS Windows '95, '98, '2000, 'NT4, 'XP and 'Win7 applications (e.g. Access, PowerPoint), GIS mapping software (e.g. MapInfo, ArcView, ArcMap), and CAD (e.g. AutoCad, TurboCad, Microstations). I have extensive experience in seismic acquisition and processing software (Ensin, Dr Geo, Surfer, GeoSoft, SES-2000, GeoSuite) and electronic side scan acquisition and processing software (Triton Elics' Isis, EdgeTech Discover, GeoSuite), as well as side scan mosaicing software (Triton's Delph Map, SonarWhiz Map). I have also extensive experience in Navigation Software (HydroPro, QINSy, PDS2000, Hypack, EIVA/Navimodel) and processing of vast multibeam bathymetry datasets using QINSy Validate, QPS QLOUD, QIMERA, Fledermaus, FMGT, FMMW and Helical. Visualization of these datasets in 3D using Helical, QLOUD, QIMERA, Fledermaus and Terramodel, and charting multibeam bathymetry data using ESRI ArcGIS, CARIS GIS, Terramodel, GeoSoft, ERMMapper, Surfer and QTC (View & Impact). In short, electronic data manipulation, processing, interpretation and presentation pose no problem to me.

Research, Synthesize, Present and Publish

As a result of my academic background and subsequent employment history I have acquired the necessary skills to research a particular topic, synthesize the results and present the pertinent findings, in a logical and succinct manner.

Independent yet Multidisciplinary

My studies and experience in the multidisciplinary fields of physical oceanography, marine geophysics and hydrography have provided me with the opportunity to develop the necessary skills to not only work independently, but also extend my efforts through collaboration with the national (and international) scientific (and commercial) marine community.

Motivation and Funding

The academic environment is notorious for always lacking sufficient funding. Additional funding for research is sought from outside the "university environment". I have had experience in drawing up successful research proposals for such funding and ensured that the sponsor's requirements have been met.

In the commercial environment I have been responsible for an annual geophysical survey budget of about R5.5m for ODM and later responsible for the daily mining and exploration activities of 4 marine diamond mining vessels, contribution to an average annual production in excess of \$9.6m USD.

As principal member and sole owner of MDC, I am responsible for all commercial ventures. MDC is currently debt-free and responsible for over R15M annual turnover.

Leadership Ability

I have successfully headed a team of physical oceanographers on board the research ship SA Agulhas to Antarctica (1994 - 1995). The relative isolation of a ship environment and length of the trip results in a rather "strained" work environment - an environment that lends itself to much inter-personal tension. I believe that my ability to successfully administer control over such situations is proof of both my leadership qualities and my ability to work and socialize with people of diverse character.

In addition, my position as Geophysics Project Leader at ODM / NAMCO is further testament of my approach to my work, both in the field and in the office.

I currently am the principal member of MDC and manage an entire survey team of twelve hydrographic surveyors and survey technicians. My current responsibility as Owner and Managing Director of MDC includes marketing, sales, training and product support.

Personality

I believe that my academic record and references are proof of my determination and sound work ethic. I am a person of honest integrity and one that values the environment we have inherited.

APPENDIX

A) PUBLICATION LIST

1) Dissertations

- i) "Correspondence between the surface and subsurface expression of some mesoscale oceanic features in South African waters." B.Sc. (Honours) Thesis, University of Cape Town.
- ii) "The hydrography and dynamics of rings and eddies of the Agulhas Retroflection: February - March 1987." M.Sc. Thesis (June 1995), University of Cape Town.

2) Publications

- i) Rigg, G.M., Lucas, M.L. and Attwood, C. (1995): Biological enhancement at the edge of an Agulhas Eddy in the Subtropical Convergence. *Marine Ecology Progress Series*. (In preparation).
- ii) Lutjeharms, J.R.E., Krause, G. and Rigg, G.M. (1993): A XBT section from Cape Town to Georg von Neumayer in the fall of 1992. (In preparation).
- iii) van Ballegooyen, R.C., Rigg, G.M. and Lutjeharms, J.R.E. (1995): Eddy fluxes at the Subtropical Convergence south of Africa. *Deep-Sea Research*. (In preparation).
- iv) Rigg, G.M. and Lutjeharms, J.R.E. (1995): Modification of Agulhas Waters through the Agulhas Retroflection. *Deep-Sea Research*. (In preparation).

3) Research and Technical Reports

- i) Rigg, G.M., van Ballegooyen, R.C. and Lutjeharms, J.R.E. (1991): Calibration of Maritime Remote Sensing. Confidential Interim Report (February - March 1991), Institute for Maritime Technology (IMT), Simon's Town, Cape Town.
- ii) Rigg, G.M. and Lutjeharms, J.R.E. (1991): Comparison of Maritime Remote Sensing Data with Subsurface Hydrological Data. Confidential Interim Report (March - September 1991), Institute for Maritime Technology (IMT), Simon's Town, Cape Town.
- iii) Krause, G., Maul, A., Ohm, K., Plugge, R., Lutjeharms, J.R.E., Phillips, R., Rigg, G.M. and Valentine, H. (1993): The Expedition ANTARKTIS X/3 of RV Polarstern in 1992: Physical Oceanography. Reports on Polar Research, 121, 1983, Alfred Wegener Institute for Polar and Marine Research, 5 - 15.
- iv) van Ballegooyen, R.C., Valentine, H.R., Lutjeharms, J.R.E., Rigg, G.M., Weeks, S. (1993): Meridional heat fluxes at the Subtropical Convergence south of Africa. (In preparation).

4) Data Reports and Memoranda

- i) Rigg, G.M., van Ballegooyen, R.C., Attwood, C., Newton, S., Lucas, M. and Lutjeharms, J.R.E. (1992): Data report on the first cruise of the South African Antarctic Marine Ecosystems Study (SAAMES-1), April - May 1991. University of Cape Town Oceanography Report 92-1.
- ii) Rigg, G.M., Cooper, J., Lucas, M.I. and Lutjeharms, J.R.E. (1995): Data report on the South African Sea Ice Margin Drogue and Ocean Flux Study (24 November - 29 January). University of Cape Town Oceanography Report 95-1. (In preparation)
- iii) Rigg, G.M., Turner, J., Mendes, M. and Wigley, R. Voyage IV: Leg II, Ultra-deep Concession 20d General Cruise Report and Preliminary Findings. 26 April - 23 May. Werner Marine Research Internal Vibrocore Cruise Report WMR-04/96-GEOL-2.
- iv) Rigg, G.M., Conradie, J., Gillman, N., Kruger, N. and Neethling, C. (2000): Swallow Breakers Detailed Survey, Terrace Bay, Northern Namibia. Confidential Geophysical Survey Report. Ocean Diamond Mining, January 2000.

B) PROFESSIONAL ACTIVITIES

1) Papers Presented

- i) Mesoscale oceanographic features observed between Cape Town and Marion Island, April - May 1991. Workshop, Medical Campus, University of Cape Town.
- ii) An Agulhas Eddy in the Subtropical Convergence and its implications for biological enhancement. Joint Global Ocean Flux Study (JGOFS) Workshop, 5 - 8 April, 1994. Graduate School of Business, Waterfront Campus, University of Cape Town.
- iii) QPS Fledermaus software applications for LOS submission. United Nations Commission Law of the Sea (UNCLOS), 22-26 Sept 2008, Windhoek, Namibia.
- iv) RESON Users Conference. Presented paper "RESON Visualization for the Namibian Diamond Mining Industry". 12 March 2012. Crown Plaza, Docklands, London, UK.

2) Posters Presented

- i) Rigg, G.M. (1993): Comparison of rings and eddies of the Agulhas Retroflection. 8th Southern African Marine Science Symposium, 'Marine Science for a Sustainable Future', Club Mykonos, Saldanha Bay, Cape Town, 17 - 22 October 1993.

3) Conferences and Seminars Attended

- i) International Symposium on Benguela Trophic Functioning. University of Cape Town, 8 - 13 September 1991.
- ii) The role of remote sensing in climate change over Southern Africa. Funding for Research and Development, CSIR, Pretoria, June 1992.
- iii) 8th Southern African Marine Science Symposium, 'Marine Science for a Sustainable Future', Club Mykonos, Saldanha Bay, Cape Town, 17 - 22 October 1993.
- iv) 9th Southern African Marine Science Symposium, 'Marine Science in southern Africa. Past perspectives and future challenges', R. Leslie Building, University of Cape Town, 21 - 23 November 1996.
- v) "New Technologies for a New Century". Technical Awareness Seminar hosted by the SA Hydrographic Society, Simons Town, Cape Town 1-5 December 2003.
- vi) Reson Users Group Conference. Thistle Tower, London, 15 March 2004.
- vii) Oceanology International. Marine Exhibition and Conference, Excel, London, 16-19 March 2004.
- viii) Technical Awareness Seminar hosted by the SA Hydrographic Society, Simons Town, Cape Town 9-13 May 2005.
- ix) Aquadyne Technical Awareness Seminar. Oscarsborg, Oslo, Norway, 24 – 27 October 2005.
- x) "Hydrography for an Emerging Africa". Technical Awareness Seminar hosted by the SA Hydrographic Society, Cape Town Hotel School, Granger Bay. Tuesday 19 – Thursday 21 June 2007.
- xi) United Nations Convention on the Law of the Sea (UNCLOS). Windhoek, Namibia. 22-26 September 2008.
- xii) Hydro 9 "Enhancing Global Capacity". Hosted by the SA Hydrographic Society, Cape Town Hotel School, Granger Bay, South Africa. 10-12 November 2009.
- xiii) Energy Africa "Where African NOC's & Governments Meet the Industry". 27-30 September 2010. International Exhibition & Strategic Conference Centre, Cape Town, South Africa.
- xiv) Maritime & Coastal Security Africa 2011. Collaboration and co-operation for African maritime security. 26-28 October 2011. CTICC, Cape Town, South Africa.
- xv) Hydro 2011 Down Under. 7-10 November 2011. Esplanade Hotel, Perth, Australia.
- xvi) Shallow Survey. 6th International Conference on High Resolution Surveys in Shallow Water. 20-24 Feb 2012. Te Papa, Wellington, New Zealand.
- xvii) Oceanology International. 12-15 March 2012. Excel, London, UK.
- xviii) Hydro 12. 13-15 Nov 2012. MV Rotterdam, Rotterdam, The Netherlands.
- xix) Ocean Business 13. 9 – 11 April 2013. National Oceanography Centre, Southampton, UK.
- xx) Oceanology International. 11-13 March 2013. Excel, London, UK.
- xxi) AfricaGeo. 1-3 July 2014. CTICC, Cape Town, South Africa.
- xxii) Hydro 14. 28-30 Oct 2014. Bridge of Don, Aberdeen, Scotland.
- xxiii) Ocean Business. 14-16 April 2015. National Oceanography Centre, Southampton, UK.
- xxiv) Shallow Survey 2015, Plymouth, U.K. (14 – 18 September 2015)
- xxv) Hydro2015. 23-25 November 2015. Cape Town International Convention Centre, Cape Town, South Africa.
- xxvi) Oceanology International. 15-17 March 2016. Excel, London, UK.

4) Workshops Attended

- i) Heard Island Global Warming Experiment. Hohenort Hotel, Cape Town, 18 February 1991.
- ii) Open Ocean Workshop and Planning Meeting. Bernard Fuller Building, University of Cape Town, 30 - 31 July 1991.
- iii) Subtropical Convergence Workshop. Dean of Science Suite, PD Hahn Building, University of Cape Town, 16 September 1991.
- iv) Interbasin Exchanges in the Southern Hemisphere. International Association for the Physical Sciences of the Oceans (IAPSO), Graduate School of Business, Waterfront Campus, University of Cape Town, 28 - 31 March 1994.
- v) Biological and Physical Control of Carbon Flux at the Subtropical Convergence and other frontal systems in the Southern Ocean. Joint Global Flux Study (JGOFS) Workshop, Graduate School of Business, Waterfront Campus, University of Cape Town, 5 - 8 April 1994.
- vi) South African Aquaculture: International opportunities, local constraints. Two Oceans Aquarium, Waterfront, Cape Town, 1 December 1995.
- vii) Preliminary findings of the JAGO submersible dive off the West Coast of South Africa. Two Oceans Aquarium, Waterfront, Cape Town, 18 November 1996.
- viii) GIS Workshop. The Power of ArcView, Menzies and R. Leslie Buildings, University of Cape Town, 20 June 1997
- ix) GeoAcoustics Pinger and Side Scan Sonar Transceiver Electronics: Faultfinding and trouble shooting. GeoAcoustics Limited, Great Yarmouth, Norfolk, England, 15 – 19 November 1999.
- x) QPS Resellers Conference. 16-19 November 2008, Loosdrecht, The Netherlands.
- xi) Hydro 2011 Workshop. 7 November 2011, Fremantle, Perth, Australia. Hosted by QPS, IVS3D and ESRI.
- xii) IVS/QPS/ESRI Users Workshop. Shallow Survey. 6th International Conference on High Resolution Surveys in Shallow Water. 20 Feb 2012. Te Papa, Wellington, New Zealand.
- xiii) QPS Resellers Conference. 28-31 Jan 2013, Zeist, The Netherlands.
- xiv) QPS QIMERA Workshop. 17 April 2015, Banbury, UK.
- xv) QPS QIMERA Workshop. 18, 21 March 2016, Banbury, UK.

5) Cruises and Surveys Participated In

- RS Sardinops: Agulhas Current Cruise, 1 - 14 February 1991
Cruise Leader: Dr. L Beckley (ORI, Durban)
Activities: Temperature / Salinity and Fish Larvae Identification along the near-shore edge of the Agulhas Current, from Cape Town to the Tugela River.
- SA Agulhas: South African Marine Ecosystems Study (SAAMES-1), 4 April - 8 May 1991
Cruise Leader: Dr. M.I. Lucas (University of Cape Town)
Activities: Supervised a physical oceanographic observational programme in a multidisciplinary research cruise. A high-resolution survey of eddies at the Subtropical Convergence was acquired.
- RV Polarstern: "Fall in the Ice" (ANT X/3), 27 March - 19 May 1992
Cruise Leader: Dr. M. Spindler (Institute for Polar Ecology, University of Kiel, Germany)
Activities: Supervised physical oceanographic observational programme of the Antarctic Slope Front. The major focus of the cruise was to observe the physical, chemical and biological processes in the region of pack ice formation in Autumn in the Weddell Sea.
- SA Agulhas: Sea Trials, 6 - 12 October 1992
Cruise Leader: Prof. J.R.E Lutjeharms (University of Cape Town)
Activities: Participated in the sea trial for the newly refurbished SA Agulhas. All the hydrographic survey equipment was tested.
- Fishing Vessel: Sea Trials, 7 - 9 December 1993
Cruise Leader: Mr. S. Bernard (University of Cape Town)
Activities: The first testing of the U.C.T spectral radiometer in False Bay was undertaken. Chlorophyll-*a*, sediment and galfstoffe samples were acquired and analyzed.
- SA Agulhas: The South African Sea Ice Margin Drogue and Ocean Flux Study, 24 November 1994 - 29 January 1995
Cruise Leader: Dr. M.I. Lucas (University of Cape Town)
Activities: Assessment of possible enhanced biological activity associated with the Antarctic Slope Front.

Kommandor
 Therese
 Cruise Leader: Vibrocore sampling, 26 April - 23 May 1996
 Mr. J. Turner (Werner Marine Research)
 Activities: Vibrocore operations over Ultra-deep Diamond Concession 20D to assess the diamond potential of Concession 20D. A total of 320 acceptable vibrocores and 1085km of single beam bathymetry were obtained.

SV Halifax
 Project Leader: Voyage 4, 3 July – 14 July 1997
 Mr. G. Rigg (ODM)
 Activities: Geophysical Surveying off Albatross and Possession Island Areas, Namibia. 188 line survey kilometers completed.

SV Halifax
 Project Leader: Voyage 5, 29 July – 05 August 1997
 Mr. G. Rigg (ODM)
 Activities: Geophysical Surveying off North Long and Possession Island Areas, Namibia. 246 line survey kilometers completed.

SV Halifax
 Project Leader: Voyage 6, 19 - 31 August 1997
 Mr. G. Rigg (ODM)
 Activities: Geophysical Surveying off Hollamsbird Island, Namibia. 1010 line survey kilometers completed.

SV Halifax
 Project Leader: Voyage 7, 20 September- 05 October 1997
 Mr. G. Rigg (ODM)
 Activities: Geophysical Surveying off Halifax and North Long Island Areas, Namibia. 140 line survey kilometers completed.

SV Halifax
 Project Leader: Voyage 8, 21 October – 03 November 1997
 Mr. G. Rigg (ODM)
 Activities: Geophysical Surveying off Ichaboe Island, Namibia. 678 line survey kilometers completed.

SV Halifax
 Project Leader: Voyage 11, 02 - 10 February 1998
 Mr. G. Rigg (ODM) & Mr. R. Carter (CSIR)
 Activities: Environmental survey of tailings plume of mining vessel MV Namibian Gem off Halifax Island, Namibia. ADCP transects, CTD stations, water samples and sediment grab samples were done

SV Halifax
 Project Leader: Voyage 12, 24 February- 05 March 1998
 Mr. G. Rigg (ODM)
 Activities: Geophysical Surveying off Possession Island, Namibia. 181 line survey kilometers completed.

SV Halifax Voyage 13, 12 - 27 March 1998
Project Leader: Mr. G. Rigg (ODM)
Activities: Geophysical Surveying off Pomona Island, Namibia. 97 line survey kilometers completed.

SV Halifax Voyage 14, 09 – 24 April 1998
Project Leader: Mr. G. Rigg (ODM)
Activities: Geophysical Surveying off Pomona and Possession Island Areas, Namibia. 620 line survey kilometers completed.

SV Halifax Voyage 15, 07 – 17 May 1998
Project Leader: Mr. G. Rigg (ODM)
Activities: Geophysical Surveying off Halifax Island, Namibia. 576 line survey kilometers completed.

SV Halifax Voyage 16, 06 – 14 June 1998
Project Leader: Mr. G. Rigg (ODM)
Activities: Geophysical Surveying off Possession and Halifax Island Areas, Namibia. 239 line survey kilometers completed.

SV Halifax Voyage 17, 02 – 16 July October 1998
Project Leader: Mr. G. Rigg (ODM)
Activities: Geophysical Surveying off Halifax Island, Namibia. 584 line survey kilometers completed.

SV Halifax Voyage 18, 30 July – 11 August 1998
Project Leader: Mr. G. Rigg (ODM)
Activities: Geophysical Surveying off Halifax Island, Namibia. 464 line survey kilometers completed.

SV Halifax Voyage 19, 27 – 29 August 1998
Project Leader: Mr. G. Rigg (ODM)
Activities: Geophysical Surveying off Albatross Island, Namibia. 13 line survey kilometers completed.

SV Halifax Voyage 20, 24 - 27 September and 09 - 11 October 1998
Project Leader: Mr. G. Rigg (ODM)
Activities: Geophysical Surveying off Seal and Penguin Island Areas, Namibia. 224 line survey kilometers completed.

SV Halifax Voyage 21, 20 October - 02 November 1998
Project Leader: Mr. G. Rigg (ODM)
Activities: Geophysical Surveying off Albatross Island, Namibia. 537 line survey kilometers completed.

SV Halifax	Voyage 22, 18 - 28 January 1999
Project Leader:	Mr. G. Rigg (ODM)
Activities:	Geophysical Surveying off Albatross Island, Namibia. 176 line survey kilometers completed.
SV Halifax	Voyage 23, 14 - 23 February 1999
Project Leader:	Mr. G. Rigg (ODM)
Activities:	Geophysical Surveying off Sandwich Bay, northern Namibia. 362 line survey kilometers completed.
SV Halifax	Voyage 25, 11 – 23 April 1999
Project Leader:	Mr. G. Rigg (ODM)
Activities:	Geophysical Surveying off Terrace Bay, northern Namibia. 0 line survey kilometers completed due to weather.
SV Halifax	Voyage 27, 06 – 23 June 1999
Project Leader:	Mr. G. Rigg (ODM)
Activities:	Geophysical Surveying off Terrace Bay, northern Namibia. 217 line survey kilometers completed.
SV Halifax	Voyage 29, 08 – 19 August 1999
Project Leader:	Mr. G. Rigg (ODM)
Activities:	Geophysical Surveying off Baker Bay and Possession Island, Namibia. 206 line survey kilometers completed.
SV Halifax	Voyage 32, 01 – 08 November 1999
Project Leader:	Mr. G. Rigg (ODM)
Activities:	Geophysical Surveying off Halifax Island, Namibia. 10 line survey kilometers completed in unfavorable weather.
MV Zacharias	Voyage 01, 03 – 24 March 2000
Client Rep.	Mr. G. Rigg (NAMCO)
Activities:	Geophysical Surveying off Halifax, Long and Possession Islands, Namibia. 351 line survey kilometers completed in favorable weather. Survey equipment: Seismics (Pinger, Sparker, Kongsberg TOPAS), Bathymetry (Single beam Odom EchoTrac, Multibeam Submetrix 2000), Side Scan Sonar (GeoAcoustics).

MV Shelf Explorer	June 2000 – present (21 days at sea in rotation cycle of one trip every two months)
Senior Fleet Manager:	Mr. G. Rigg (Gemfarm)
Activities:	Management of mining and exploration activities off Namibia for NAMDEB. Responsible for managing mining and prospecting activities, DGPS positioning, mining database design and management, daily reporting.
MV Lady-S	June 2000 – present (21 days at sea in rotation cycle of one trip every two months)
Senior Fleet Manager:	Mr. G. Rigg (Gemfarm)
Activities:	Management of mining and exploration activities off Namibia for NAMDEB. Responsible for managing mining and prospecting activities, DGPS positioning, mining database design and management, daily reporting.
MV Anya	June 2000 – present (21 days at sea in rotation cycle of one trip every two months)
Senior Fleet Manager:	Mr. G. Rigg (Gemfarm)
Activities:	Management of mining and exploration activities off Namibia for NAMDEB. Responsible for managing mining and prospecting activities, DGPS positioning, mining database design and management, daily reporting.
MV Spirit of Namibia	June 2000 – present (21 days at sea in rotation cycle of one trip every two months)
Senior Fleet Manager:	Mr. G. Rigg (Gemfarm)
Activities:	Management of mining and exploration activities off South Africa for ALEXKOR. Responsible for managing mining and prospecting activities, DGPS positioning, mining database design and management, daily reporting.
SAS Protea	18 – 22 July 2005
Field Technician:	Mr. G. Rigg (Reson)
Activities:	Implementation and testing of new bottom detect algorithm for the Reson SeaBat8160 and Reson Cruise Control Software over the continental shelf break off East London, South Africa.

<p>SV Mermaid Party Chief Activities:</p>	<p>06 – 14 February 2006 Mr. G. Rigg (MDC) MOB, cal and survey Al Raha Beach Project, Abu Dhabi for Southern Gulf Surveys. Equipment spread: Trimble 4400 base and rover, Pacific Crest radios, ODOM Echotrack SBES, INNOMAR SES-2000 Compact parametric seismic system, Valeport 740 Tide Gauge, Hydro Pro2.3, ISE 2.9.</p>
<p>SV Anglian Sovereign Party Chief Activities</p>	<p>02 – 29 March 2006 Rob Bertram (NetSurvey) Multibeam hydrographic survey and wreck search over the eastern approaches of Sanday and Stronsay, Orkneys, Scotland. Client: Maritime and Coastguard Agency (MCA) and UKHO. Equipment spread: Fugro Starfix HP navigation. CSI DGPS Max. Trimble / Applanix POS MV navigation, motion and heading reference unit. Reson 7125 multibeam sonar. Navitronics SVP-60 & SVP-15 sound velocity probes. Valeport 740 Tide Gauges. Aanderaa moored tide gauge. Sonardyne acoustic release. Reson PDS2000 acquisition software. CARIS HIP / SIPS bathy processing software. Fledermaus IVS 3D CUBE editing software.</p>
<p>SV Hans M Party Chief Activities</p>	<p>30 April – 17 May 2006 Jesper Hoejdal (Dan Survey) Multibeam hydrographic survey combined with SSS, Sparker, Boomer and Grab samples over Horns Rev, Esbjerg, Denmark. Evaluation of potential wind farm site for GEUS. Client E2. Equipment Spread: Simrad EM3002 dual head multibeam echosounder. Simrad Seatex MRU5 motion sensor. AD Navigation DSC200 GPS/GLONASS L1/L2 RTK receiver and dual antenna. QINSy 7.5 acquisition and processing software. AML mini SVP. Navitronics SVP15. QPS QLOUD editing software. Post-processing of all Horns Rev MBES data in QPS QLOUD.</p>
<p>SV Anglian Sovereign Party Chief Activities</p>	<p>07 July – 04 August 2006 Rob Bertram (NetSurvey) Multibeam hydrographic survey and wreck search over the eastern approaches of Sanday and Stronsay, Orkneys, Scotland. Client: Maritime and Coastguard Agency (MCA) and UKHO. Equipment spread: Fugro Starfix HP navigation. CSI DGPS Max. Trimble / Applanix POS MV navigation, motion and heading reference unit. Reson 7125 multibeam sonar. Navitronics SVP-60 & SVP-15 sound velocity probes. Valeport 740 Tide Gauges. Aanderaa moored tide gauge. Sonardyne acoustic release. Triton Elics ISIS and Hypack Max acquisition software. CARIS HIPS / SIPS bathy processing software. Fledermaus IVS 3D CUBE editing software.</p>

MV Grampian Surveyor 10 October – 21 November 2006

Party Chief

José Alvarez (DeepOcean Subsea Services Ltd)

Activities

Senior surveyor. Dual-head Multibeam installation, calibration and ROV pre-lay, post-lay and as-laid surveys over the Tweedsmuir Field Development, Talisman Energy pipeline, Piper Alpha, North Sea Sector, UK. Equipment spread: Fugro Starfix HP navigation. Ixsea Octans 3000, TSS 440 Pipetracker, RDI Doppler, Modus IP Pressure Sensor, Reson 8125 MBES x2, Tritech Bathy and Altimeter, Tritech SOA Sonar, Kongsberg HiPAP USBL system. QPS QINSy navigation and multibeam processing software.

De Beers Marine Diamond Mining Fleet29 - 32 January 2007

Senior Surveyor

Tony Nyman (De Beers Marine Namibia)

Activities

Upgrade of QINSy navigation software from V.6.x to V.7.x on board the De Beers mining vessels *DebMar Pacific*, *DebMar Atlantic*, *Ya Toivo*, *Gariiep* and *Grand Banks*. Onboard QINSy V7.x training given to all mining vessel surveyors.

MV Grampian Surveyor 12 January – 28 February 2007

Party Chief

Andy Brakenridge (DeepOcean Subsea Services Ltd)

Activities

Senior surveyor. Spool piece Metrology over Tweedsmuir Field Development, Talisman Energy and ROV dual-head MBES pre-lay, post-lay and as-laid surveys over the Tweedsmuir pipeline, Piper Alpha, North Sea Sector, UK. Equipment spread: Fugro Starfix HP navigation. Ixsea Octans 3000, TSS 440 Pipetracker, RDI Doppler, Modus IP Pressure Sensor, Reson 8125 MBES x2, Tritech Bathy and Altimeter, Tritech SOA Sonar, Kongsberg HiPAP USBL system, Sonardyne Fusion LBL system. QPS QINSy navigation and multibeam processing software.

SV Anglian Sovereign 26 April - 07 June 2007

Party Chief

Paul Robertson (NetSurvey)

Activities

Multibeam hydrographic survey and wreck search over the eastern approach of Pentland Firth, Orkneys, Scotland. Client: Maritime and Coastguard Agency (MCA) and UKHO. Equipment spread: Fugro Starfix HP navigation. CSI DGPS Max. Trimble / Applanix POS MV navigation and heading and motion reference unit, Trimble SPS770 GPS Base Receiver. Reson 7125 multibeam sonar. Navitronics SVP-60 & SVP-15 sound velocity probes. Tidalite IV Tide Gauge. Triton Elics ISIS and Hypack Max acquisition software. CARIS HIPS / SIPS bathy processing software. Fledermaus IVS 3D CUBE editing software.

<p>SV Sir William Party Chief Activities</p>	<p>30 July - 02 August 2007 Gordon Rigg (MDC) Multibeam hydrographic survey over shallow coastal waters off Exmouth, Devon, England. Client: Halcrow. Equipment spread: Leica RTK base station. Trimble / Applanix POS MV navigation and heading and motion reference unit. Geoswath 500 kHz multibeam sonar. Navitronics SVP-15 sound velocity probe. QINSy 7.5 acquisition software. CARIS HIPS / SIPS bathy processing software. Fledermaus IVS 3D CUBE editing software.</p>
<p>SV Kashif Party Chief Activities</p>	<p>04 – 24 September 2007; 06 October – 06 November 2007. Gordon Rigg (MDC) Multibeam survey over “The World” Island Project, Dubai, United Arab Emirates. Client: Nakheel. Equipment Spread: Trimble 4700 RTK GPS, TSS DMS205 motion sensor, TSS Meridian Surveyor gyro, Reson 8101 multibeam sonar, Navitronics SVP-15 sound velocity probe. QINSy 7.5 acquisition software, QPS QLOUD processing software, Terramodel 9.8, AutoCAD 14.</p>
<p>SV Ping Survey Reporting Activities</p>	<p>20 January – 02 March 2008 Martin Wikmar (MMT) Multibeam hydrographic survey and reporting over the shallow coastal waters of the Sound of Harris, Isle of Harris, Outer Hebrides, Scotland. Client: MMT / NetSurvey / MCA. Equipment Spread: Trimble 750, Applanix POS MV 320 navigation and heading and motion reference unit, SIMRAD Kongsberg dual head EM3002, Applied Microsystems Smart SV&P. CARIS HIPS / SIPS bathy processing software. Fledermaus IVS 3D CUBE editing software.</p>
<p>SV TB Davie Client Rep Party Chief Activities</p>	<p>30 April – 25 May 2008 Gordon Rigg (MDC) Dave Murrell (Underwater Surveys) Multibeam survey over the inner shelf of Namibia, from Lüderitz to the Orange River, Namibia. Client: Namdeb. Equipment Spread: Veripos Ultra DGPS, Octans 3000, Reson 8101, Navitronics SVP15, QINSy 8.0, QLOUD 2.0 processing software.</p>
<p>MV DebMar Pacific Senior Surveyor Mine Prod. Super. Activities</p>	<p>23 June – 2 July 2009 Gordon Rigg (MDC) Edwin Harvey (De Beers Marine Namibia) Design, install and trial QINSy 3D Drill String Positioning. Client: De Beers Marine Namibia. Software: QPS QINSy V8.0 and Dredge Add-On Module. Hardware: C-Nav 2050 RTG, Trimble 7200 RTK, Seatex MRU, Anschutz Gyro, Sonardyne Fusion USBL, Valeport mini SVP.</p>

MV DebMar Pacific MV DebMar Atlantic MV !Gariiep Senior Surveyor Chief Surveyor Activities	9 October – 5 November 2009 Gordon Rigg (MDC) Dave Bansaemer (De Beers Marine Namibia) Install and commission QINSy 3D Drill String Positioning. Client: De Beers Marine Namibia. Software: QPS QINSy V8.0 and Dredge Add-On Module. Hardware: C-Nav 2050 RTG, Trimble R7 RTK, Seatex MRU, Anschutz Gyro, Sonardyne Fusion USBL, Valeport mini SVP.
SV Triad Chief Surveyor Activities	24 July – 07 August 2010 Gordon Rigg (MDC) Multibeam hydrographic routine re-survey and reporting over the shallow coastal waters of Harwich, East Anglia, UK. Client: MMT / NetSurvey / MCA. Equipment Spread: Trimble 750, Applanix POS MV 320 navigation and heading and motion reference unit, SIMRAD Kongsberg dual head EM3002, Applied Microsystems Smart SV&P. CARIS HIPS / SIPS bathy processing software. Fledermaus IVS 3D CUBE editing software.
RS Solander Senior Surveyor Activities	10 – 29 August 2010 Gordon Rigg (MDC) Fault-finding Kongsberg EM3002 DH MBES, patch test and multibeam survey for Geoscience Australia. Bonaparte Ridge, Darwin, Australia. Equipment Spread: C-Nav 2050R, Applanix POSMV 320, Kongsberg EM3002, Valeport MiniSVS, Applied Microsystems SV Plus2, CARIS HIPS, IVS3D Fledermaus Professional and FM Geocoder.
SV DP Star Client Representative Activities	14 July – 17 August 2011 Gordon Rigg (MDC) Client Representative and onboard NUTAM's dedicated geophysical survey vessel DP Star. Survey planning and data QC/QA for NAMDEB's Inner Shelf Geophysical Survey, Namibia. Equipment Spread: C-Nav 3050, TOPAS PS40, EA 400, Seatex MRU5, EM710, Applied Acoustics Squid 2000, Geospark 1000 PPS, MiniTrace 2, QINSy 8, Geosuite.

<p>SV Franklin Senior Data Processor Activities</p>	<p>19 Sept – 17 Oct 2012 Gordon Rigg (MDC) Vessel and ROV Geophysical and Multibeam surveys of the Statnet UK-Norway and Lofotrungen Cable Routes. Client: MMT. Equipment Spread: Trimble 750, Applanix POS MV 320 navigation and heading and motion reference unit, SIMRAD Kongsberg EM710, Applied Microsystems Smart SV&P, IXSEA PHINS, RESON 7125 DH ROV2. CARIS HIPS / SIPS bathy processing software. Fledermaus IVS 3D CUBE editing software. Navimodel.</p>
<p>SV Seabeam Offshore Manager Activities</p>	<p>14 – 28 March, 2012, Northern Scotland and Orkneys, UK. Gordon Rigg (MDC) Mobilize and perform multibeam and geophysical survey for SSE CMS & Orkney Nearshore HVDC cable route landfalls. Client: MMT: Equipment Spread: Kongsberg EM302DH, Applanix POSMV320, Edgetech 4200 SSS, Geometrics g-882 magnetometer, Knudsen Pinger/Chirp, GeoResources Sparker, IXSEA GAPSII, C-Nav3050, QINSy 8.0.</p>
<p>SV Seabeam Offshore Manager Activities</p>	<p>20 May – 14 June 2013, Blythe, UK. Gordon Rigg (MDC) Mobilize and perform multibeam and geophysical survey for Statnett National Grid cable route landfalls. Client: MMT: Equipment Spread: Kongsberg EM302DH, Applanix POSMV320, Edgetech 4200 SSS, Geometrics g-882 magnetometer, Knudsen Pinger/Chirp, GeoResources Sparker, Drop-CAM, IXSEA GAPSII, C-Nav3050, QINSy 8.0.</p>
<p>SV Snowgoose Offshore Manager Activities</p>	<p>05-09 Sept 2013, Lüderitz, Namibia. Gordon Rigg (MDC), Steve Britz (MDC) Mobilize and perform multibeam rig site survey for Mariana Rig. Client: Cape Diving: Equipment Spread: RESON 7125, APPLANIX POSMV320, C-Nav3050, QINSy 8.0.</p>
<p>SV Icebeam Offshore Manager Activities</p>	<p>30 Oct – 27 Nov 2013, Blythe, UK. Gordon Rigg (MDC) Mobilize and perform multibeam survey for Swedish Maritime Administration. Client: MMT: Equipment Spread: Kongsberg EM2040D, Applanix POSMV320, C-Nav3050, QINSy 8.0.</p>

<p>SV Beach Binti Senior Surveyor Activities</p>	<p>09-12 Oct 2014, Lake Tanganyika, Tanzania. Gordon Rigg (MDC), Michael Funke (MDC) Mobilize and perform single beam survey of proposed gas pipeline landfall. Client: Beach Energy: Equipment Spread: ODOM 200/33 kHz SBES, TSS DMS2-05, C-Nav3050, QINSy 8.0.</p>
<p>SV Geomari Offshore Manager Activities</p>	<p>30 Oct – 27 Nov 2014, Aland, Finland. Gordon Rigg (MDC) Mobilize and perform magnetometer and ROV cable route surveys for Kraftnat Aland. Client: MMT: Equipment Spread: Geometrics G882 TVG, Ocean Modules V8 ROV, IXSEA GAPS-III, C-Nav3050, QINSy 8.0.</p>
<p>SV Northern Wind Offshore Manager Activities</p>	<p>10 June – 08 July 2015, Raahe, Finland. Gordon Rigg (MDC) Mobilize and perform hydrographic multibeam survey for the Finish Transport Agency (FTA) on Clinton’s survey vessel Northern Wind. Client: Clinton. Equipment Spread: Kongsberg 2040 DH dual transmit, Kongsberg Seapath 330+, Valeport SVX2 and Mini-SVS, EIVA Navipac and NaviEdit.</p>
<p>MV Askari Pacific Party Chief Activities</p>	<p>19 Sep – 19 Oct 2015, Mossel Bay, South Africa. Gordon Rigg (MDC) Mobilize and perform Mohican ROV pipeline survey inspection of the F-A Satellites and South Coast Gas Development Fields. Client: PetroSA. Equipment Spread: Colour Sit Camera, Kongsberg Boom Camera, R2Sonic 2024 multibeam sonar, Valeport mini SVS & SVP, iXBlue ROVINS, Teledyne RDI Workhorse DVL, Teledyne BlueView P900-130 Imaging Sonar, Deepwater Polartack ROVII CP System, Innova Matrix MKII + Fibre Optic telemetry System, Valeport IPS Pressure Sensor, Sonardyne Ranger II, QINSy acquisition and processing software.</p>

6) Multibeam Installations and Demonstrations

SV Madiba Technician: Activities:	13 – 22 May 2002, Cape Town Harbour Mr. G. Rigg (RESA) Mob 8101 Multibeam system for De Beers Marine rental. Calibrate system and train De Beers AUV Survey Team to operate the MBES. Rental.
SV Rebecca Surveyor: Activities:	19 – 26 June 2002, Lüderitz Harbour Mr. G. Rigg (RESA) Mob 8125 Multibeam system and survey the ultra-shallow diamondiferous deposits off Lüderitz, Namibia. Work completed for NAMDEB to assist resource management of diver-based mining and exploration activities for marine diamonds. Demonstration.
SV Surveyor Surveyor: Activities:	17 – 19 July 2002, Ramsgate Harbour, London Mr. G. Rigg (RESA) 8125 Multibeam survey of the American Liberty ship wreck, Richard Montgomery, carrying 6000 tones of live munitions on board, which sank on 20 August 1944 in the entrance of Thames Estuary, Swale, London. Survey completed for the Archeological Dive Unit (ADU), University of St Andrews, UK. Demonstration.
SV Genesis Surveyor: Activities:	22 – 27 July 2002, Grand Camp Maisey Harbour, France Mr. G. Rigg (RESA) Mob 8125 Multibeam system and survey the D-Day ships, tanks, landing craft and caissons wrecks sunk off the Omaha and Utah beaches, Grand Camp Maisey, Normandy, France (Operation Neptune, 6 June 1944). Survey work performed for the US Naval Historical Center (NHC) Underwater Archaeological Branch with cooperation from the Hydrographic Center at the University of New Hampshire and the US Navy's Naval Surface Carderock Division. Rental.
MV Lady S Technician: Activities:	8 – 27 October 2002, Cape Town Harbour Mr. G Rigg (RESA) Mob 8101 Multibeam Rotation system, calibrate and train Gemfarm staff to operate. Rotation system used to visualize the seabed for dredging activities using an airlift and the vessel stationary on a 4-point mooring system. Rental.
MV Zacharias Technician: Activities:	3 – 6 December 2002, Cape Town Harbour Mr. G. Rigg (RESA) Mob 8101 Multibeam system for NAMCO. MBES system to be used for seabed mapping for the marine diamond industry. Project terminated on 6 December when NAMCO were liquidated. Purchase.

RS Algoa 15 January – 01 February 2003, Cape Town Harbour
Technician: Mr. G. Rigg (RESA)
Activities: Mob 8101 Multibeam system for De Beers Marine AUV survey team. Calibrate and train survey staff to operate the system. Rental.

SV NHC Surveyor 07 February – 15 March 2003, Port Elizabeth Harbour
Technician: Mr. G. Rigg (RESA)
Activities: Mob 8125 Multibeam system for Concor (Coega Project, Port Elizabeth). Purchase.

SAS Umhloti 06 – 14 May 2003, Simons Town Harbour
Technician: Mr. G. Rigg (RESA)
Activities: Mob 8125 and 8128 Multibeam systems for the SA Navy. Demonstration in Mine Garden off Clovelly to illustrate mine hunting ability of 8128 and objected mapping using the 8125. Demonstration.

SAS Tern 15 – 20 May 2003, Simons Town Harbour
Technician: Mr. G. Rigg (RESA)
Activities: Mob 8125 on small catamaran vessel to illustrate portability and repeatability of the 8125 MBES system. Survey demonstration over the Mine Garden, Clovelly. Additional survey demonstration over Whittle Rock and the SAS Pietermaritzburg wreck, Simons Bay. Demonstration.

SV FKNoz 29 May – 2 June 2003, Katse Dam, Lesotho
Technician: Mr. G. Rigg (RESA)
Activities: Mob 8101 on small ski boat for Subtech. Survey over helicopter crash site to locate wreckage. Additional surveys over dam wall and Mohale Inlet. Rental.

SV Seevalk 29 July – 01 Aug, 15 - 16 August 2003, Shark Alley, Gaansbaai
Technician: Mr. G. Rigg (RESA)
Activities: Mob 8125 multibeam and underwater visual camera on a police patrol boat to locate disposed human body parts for the Scorpions. Rental.

SV Palma 18 - 30 September 2003, Maputo Port, Mozambique
Technician: Mr. G. Rigg (RESA)
Activities: Mob 8125 multibeam system on Inahina's dedicated survey vessel for hydrographic surveys of all Mozambican shallow ports and approaches. Rental.

SAS Protea 20 October – 5 November 2003, Simons Town Dry Dock
Technician: Mr. G. Rigg (RESA)
Activities: Mob 8160 deepwater multibeam sonar for the SA Navy Hydrographic Department. MBES system designed to map the continental shelf break (1500 – 3000m water depth). Purchase.

SV Sea Lab Technician: Activities:	<p>28 November – 5 December 2003, Simons Town Mr. G. Rigg (RESA) Mob and demonstrate “New Technologies for a New Century” to the marine survey industry during the “Technical Awareness Seminar”. Demonstration. Equipment spread: Navigation: C&C Technologies C-Nav DGPS Fugro Starfix XP DGPS CSI Max DGPS Gyro: TSS Meridian Surveyor (H) Motion Sensors: IXSEA Octans (H, P, R, H) CODA/OCTOPUS F180 (H, P, R, H) TSS DMS205 (H, P, R) Sound velocity probes: Valeport Navitronics Tide Gauge: Valeport Single Beam Echosounder: Valeport MIDAS Surveyor Multibeam Echosounder: Reson 8125 Side Scan Sonar: Klein 3000 USBL: Sonardyne Fusion</p>
SV Alexkor1 Technician: Activities:	<p>1 - 8 April 2004, Alexander Bay Port Mr. G. Rigg (RESA) Mob Reson 8125 on Alexkor ski catamaran for ultra shallow surveys of the diamondiferous deposits off Alexander Bay. Rental. Navigation: Leica 1200 RTK CSI Max DGPS Gyro: TSS Meridian Surveyor (H) Motion Sensors: TSS DMS205 (H, P, R) Sound velocity probes: Navitronics SVP-14 Navitronics SVP-C Multibeam Echosounder: Reson 8125</p>
MV Ya Toivo Technician: Activities:	<p>14 – 21 September 2004, Atlantic 1, Namibia Mr. G. Rigg (RESA) Mob Reson 8125 on Ya Toivo sub-sea Crawler mining tool and interface to QINSy acquisition software. Purchase. QINSy and Terramodel software training on board. Navigation: Omnistar and Trimble 4000 DGPS Motion sensor & Gyro: Anshultz (H,P,R,H) USBL: Sonardyne Multibeam Echosounder: Reson 8125</p>

MV SeaWalker 26 – 29 September 2004, Oranjemund, Namibia.
 Technicians: Mr. G. Rigg, Mr. N. Herrington, Mr. M. Prowse (RESA)
 Activities: Mob Reson 8125 rotation system on SeaCore jack-up rig MV SeaWalker for real-time dredge visualization in QINSy. Demo.
 Navigation: Trimble MS860 RTK
 Motion sensor: TSS DMS2-05 (H,P,R)
 Multibeam Echosounder: Reson 8125

MV Filippo Brunelleschi

10 - 14 January 2005, Port Elizabeth, South Africa.
 Technician: Mr. G. Rigg (RESA)
 Activities: Mob Reson 8125 system on trailing suction hopper dredger for De Beers Marine real-time dredge visualization. Rental.
 Navigation: C-Nav 2050 DGPS
 Motion sensor & Gyro: TSS MAHRS (H,P,R,H)
 Multibeam Echosounder: Reson 8125

MV SeaWalker

18 – 28 January 2005, Oranjemund, Namibia.
 Technicians: Mr. G. Rigg & Mr. N. Herrington (RESA)
 Activities: Mob Reson 8125 rotation system on SeaCore jack-up rig MV SeaWalker for real-time dredge visualization in QINSy. Purchase.
 Navigation: Trimble MS860 RTK
 Motion sensor: TSS DMS2-05 (H,P,R)
 Multibeam Echosounder: Reson 8125

SAS Protea

21 – 25 February 2005, Simons Town, South Africa.
 Technician: Mr. G. Rigg (RESA)
 Activities: Mob EdgeTech 4200 FS dual frequency 100/500 kHz digital side scan sonar towfish and processor unit for the South African Navy. Interfaced to Discover acquisition software and training. Side scan mosaicing using SonarWiz Map software. Purchase.

SV Sea Lab

4 – 13 May 2005, Simons Town, South Africa
 Technicians: Mr. G. Rigg (RESA) and Mr. N. Herrington
 Activities: Mob and demonstrate Reson 8124, QINSy7.5 and PDS2000 to the marine survey industry during the “Technical Awareness Seminar”. South African Hydrographic Society. Demonstration.

Equipment spread:

Navigation: C&C Technologies C-Nav RTK
 CSI Max DGPS
 Gyro: TSS Meridian Surveyor (H)
 Motion Sensors: Applanix POSMV RTK
 (H, P, R, H, Position)
 TSS DMS205 (H, P, R)
 Sound Velocity Probes Navitronics SVP-14. SVP-C
 Multibeam Echosounder: Reson 8124

MV SeaWalker 6 – 12 June 2005, Oranjemund, Namibia.
 Technicians: Mr. G. Rigg (RESA) & Mr. W. Blankenburg (Van Der Leun)
 Activities: Mob rotary encoders, slew sensor and inclinometer for 3D excavator tool visualization in QINSy7.5. Purchase.

SV Mermaid 23 June – 1 July 2005, Abu Dhabi, U.A.E.
 Technician: Mr. G. Rigg (RESA)
 Activities: Mob Reson 8101, pre-dredge survey, data processing and data report for Southern Gulf Surveys. Client: Boskalis Abu Dhabi.

Equipment spread:
 Navigation: Trimble 4400 RTK base and rover
 CSI Max DGPS
 Gyro: TSS Meridian Surveyor (H)
 Motion Sensor: TSS DMS205 (H, P, R)
 Sound Velocity Probes Valeport Mini SVP & Valeport SVP
 Multibeam Echosounder: Reson 8101

Subtech Surveyor 27 - 29 July 2005, Durban, South Africa
 Technicians: Mr. G. Rigg and N. Herrington (RESA)
 Activities: Mob Reson 8101 and Applanix POS MV for Marine Geosolutions.

Equipment spread:
 Navigation: CNAV DGPS
 Gyro: Applanix POSMV (H)
 Motion Sensor: Applanix POSMV (H, P, R)
 Sound Velocity Probe Navitronics SVP-15
 Multibeam Echosounder: Reson 8101

SV Ingwegwe 22 – 24 August 2005, Durban, South Africa
 Technicians: Mr. G. Rigg and M. Prowse (RESA)
 Activities: Mob Reson 8125 and peripherals for NPA survey of Durban Harbor debris field.

Equipment spread:
 Navigation: Leica 1200 RTK base and rover
 Gyro: TSS Mahrs (H)
 Motion Sensor: TSS Mahrs (H, P, R)
 Sound Velocity Probe Navitronics SVP-15
 Multibeam Echosounder: Reson 8125

SV Zephyr 2 – 13 October 2005, Santa Barbara, California, U.S.A.
Technician: Mr. G. Rigg (RESA)
Activities: Mob new Reson 7125 MBES, perform sea trials and compare to 8125 for RINC R&D. Reson internal performance trials.

Equipment spread:
Navigation: CSI Vector DGPS
Gyro: CSI Vector & Applanix POSMV (H)
Motion Sensor: Applanix POSMV & TSS DMS205 (H, P, R)
Sound Velocity Probes Navitronics SVP-15, Seabird MicroCat
Multibeam Echosounder: Reson 7125 & 8125

SV Idun 22 – 27 October 2005, Aquadyne Technical Awareness Seminar, Oscarsborg, Oslo, Norway.
Technician: Mr. G. Rigg (RESA)
Activities: Mob new Reson 7125 MBES on survey vessel and demonstrate to Norwegian marine industry. PDS2000 acquisition.

Equipment spread:
Navigation: Trimble AG DGPS
Gyro: Applanix POSMV & TSS Marinus (H)
Motion Sensor: Applanix POSMV & TSS Marinus (H, P, R)
Sound Velocity Probes SAIV CTD SD204, Seabird MicroCat
Multibeam Echosounder: Reson 7125

SV Havternen 6 – 16 November 2005, RAS 7125 Dual Head Pipe Inspection Trials. Internal R&D Reson Trials, Dragor, Copenhagen, Denmark.
Technicians: Mr. G. Rigg (RESA) and Mr. D. Firth (ROL).
Activities: Mob new Reson 7125 DH MBES on survey vessel and demonstrate performance of the dual head and pipe detection algorithms. PDS2000 data acquisition.

Equipment spread:
Navigation: Ashtech Z12 RTK base and rover
Gyro: Applanix POSMV (H)
Motion Sensor: Applanix POSMV (H, P, R)
Sound Velocity Probes Seabird MicroCat & Navitronics SVP14
Multibeam Echosounder: 2x Reson 7125

SV Kashif 5 – 12 September 2007, “The World” Multibeam Hydrographic Survey. Abu Dhabi, U.A.E.

Technicians: Mr. G. Rigg (MDC) and Mr. C. Summers (MDC).

Activities: Mob Reson 8101 MBES on Southern Gulf Surveys SV Kashif for “The World” offshore island development in Dubai. QINSy 7.5 data acquisition and QLOUD data processing software.

Equipment spread:

Navigation:	Trimble 5700 RTK base and rover
Gyro:	TSS Meridian Surveyor
Motion Sensor:	TSS DMS205 (H, P, R)
Sound Velocity Probe	Navitronics 60
Multibeam Echosounder:	Reson 8101

SV Naffith 16 – 22 September 2009, “Lulu Island” Multibeam Hydrographic Survey. Abu Dhabi, U.A.E.

Technician: Mr. G. Rigg (MDC).

Activities: Mob Reson 8101 MBES on Southern Gulf Surveys SV Naffith for “Lulu Island” breakwater survey, Abu Dhabi. QINSy 8.0 data acquisition and QLOUD data processing software.

Equipment spread:

Navigation:	Trimble 7200 RTK base and rover
Gyro:	TSS Meridian Surveyor
Motion Sensor:	TSS DMS205 (H, P, R)
Sound Velocity Probe	Valeport 606
Multibeam Echosounder:	Reson 8101

SV Na Fith 7 April – 6 May 2010

Party Chief, Senior Technician and Chief Surveyor Gordon Rigg (MDC)

Activities Multibeam mobilization and cable route geophysics survey for GEMS, Abu Dhabi. Equipment Spread: C-Nav 2050M, TSS DMS205, TSS Meridian Surveyor Gyro, Deso 15 SBES, Reson 8101 MBES, Geoacoustics Pinger, Geoacoustics SSS, QINSy v8, CODA DA2000.

MV The Explorer 10 – 17 December 2010, 6 – 21 January 2011

Senior Technician and Surveyor Gordon Rigg (MDC)

Activities Mobilize, calibrate and operate Reson 7125 pan and tilt mining visualization sonar system for Namdeb, Namibia.

Equipment Spread: Reson 7125 ROV2 MBES, Applanix POSMV 320, Octans 3000, Reson SVP-70, Reson SVP-15, C-Nav 2050M, QINSy v8, IVS3D Fledermaus.

RV Ellen Khuzwayo Senior Technician and Surveyor Activities	13 – 14 April 2012, Cape Town, South Africa Gordon Rigg (MDC) Patch Test calibration of RESON 7101 ER and GAMS calibration of Applanix POSMV320 for De Beers Marine South Africa AUV team. Interfacing and QC/QA QINSy database setup. Equipment Spread: Reson 7101ER MBES, Applanix POSMV 320, Octans 3000, Reson SVP-70, Reson SVP-15, C-Nav 2050M, QINSy v8.
SV Surveyor Senior Surveyor Activities	22 January, 2012, A-berth, Cape Town, South Africa Gordon Rigg (MDC), Nick Herrington (MDC), Jaco De Beer (MDC) Perform independent sea trial of Teledyne ODOM's latest MB1 multibeam system for local Cape Town Teledyne agent, C&C Technologies. Equipment Spread: MB1, TSS DMS-10, Hemisphere VS111, C-Nav3050, QINSy 8.0, Fledermaus 7.4.
SV Abigail Senior Surveyor Activities	06 - 15 Aug 2014, Lüderitz, Namibia Gordon Rigg (MDC), Andrew Birkett (MDC), Steven Britz (MDC) Install, calibrate and perform multibeam survey of diamondiferous deposits off the southern Namibian Coast. Equipment Spread: RESON 7125, APPLANIX POSMV 320, SVP-70, Valeport SVS, C-Nav3050, QINSy 8.0, Fledermaus 7.4.
SV MaDCat Senior Surveyor Activities	06 – 11 Feb 2015, Dooring Baai, South Africa for WEPEX Gordon Rigg (MDC), Raven Brink (MDC) Install, calibrate and perform multibeam survey of diamondiferous deposits off the West Coast of South Africa. Equipment Spread: RESON 7125, APPLANIX POSMV 320, SVP-70, Valeport SVS, C-Nav3050, QINSy 8.0, Fledermaus 7.4.
SV MaDCat Senior Surveyor Activities	15 – 18 Feb 2015, Dooring Baai, South Africa for Retief Coastal Diving Gordon Rigg (MDC), Steven Britz (MDC) Install, calibrate and perform multibeam and sub-bottom survey of diamondiferous deposits off the West Coast of South Africa. Equipment Spread: RESON 7125, APPLANIX POSMV 320, SVP-70, Valeport SVS, C-Nav3050, QINSy 8.0, Fledermaus 7.4, GeoAcoustics Pinger, CODA DA, Geosuite.

MV Northern Wind	08 June – 09 July 2015, Multibeam hydrographic survey of the bay of Bothnia, Finland, for the Finish Transport Agency (FTA).
Party Chief	Gordon Rigg (MDC)
Activities	Install, calibrate and perform multibeam hydrographic survey, critical for the efficient routing and safe navigation for all types of shipping. Equipment Spread: KONGSBERG EM2040D, KONGSBERG SEAPATH 330+, FUGRO SEASTAR DGPS, IALA/SBAS DGPS, VALEPORT MIDAS SVX2, VALEPORT mini SVS, EIVA, Navimodel.
MV Askari Pacific	21 Sept – 21 Oct 2015, ROV pipeline inspection of SAPREF’s F-A Satellites and South Coast Gas Development Fields, Mossel Bay, South Africa.
Offshore Manager	Gordon Rigg (MDC)
Activities	Install, calibrate and perform ROV pipeline inspection of SAPREF’s pipelines to determine the status of the pipe, including freespan and cathodic protection. Equipment Spread: Sub-Atlantic Mohican ROV, R2SONIC 2022 MBES, VALEPORT mini SVS, IxBlue Octans, IxBlue ROVINS, Teledyne RDI Workhorse DVL, BlueView P900-130 Imaging Sonar, Deepwater Polartrack CP System, STR SeaDV Inspection Recorder and video overlay, INNOVA Matrix MKII MUX and Fibre Optic Telemetry System, Sonardyne Ranger II USBL system, VERIPOS DGPS, QINSy acquisition and processing software.

7) Computing Courses Attended

- i) Solaris Enhanced User Skills, 17 - 18 October 1996
- ii) Solaris Introduction to System Administration, 24 - 25 October 1996
- iii) MapInfo Professional Training Course, 15 - 16 April 1997
- iv) Introduction to ArcView GIS Course, 31 March – 01 April 1998
- v) PDS 2000 Professional Training Course, 8 – 12 March 2004
- vi) CARIS GIS Digital Chart Production, 3 – 7 May 2004
- vii) EIVA Navipac Online, NaviEdit & Navimodel Extended Training. 23 Feb – 05 March 2015.

8) Training Courses Presented

- i) Fledermaus Professional Software Training for the Council for Geoscience. 30 July – 1 August 2012.
- ii) QINSy Drill String Positioning Training for De Beers Marine Namibia survey staff. Quayside Hotel, Simons Town, South Africa. 12-14 August 2015.

9) Membership of Professional Societies

- i) Marine Science Society of Southern Africa (MSSSA), 1992 - 1995
- ii) South African Council for Natural Scientific Professions (SACNASP), 1997
- iii) Hydrographic Society of South Africa (HSSA), 2002 - Present

10) Tickets and Licenses

- i) CASA Yacht Skippers Ticket - Local Waters. Certificate No. 989. 19 December 1997.
- ii) Restricted Radiotelephone Operator's License (VHF, MF and HF).
- iii) OPITO APPROVED Basic Offshore Safety Induction and Emergency Training (Including EBS. FALCK, Aberdeen, Scotland. Held on 22/10/2014 – 24/10/2014). Valid until 23/10/2018.
- iv) OPITO APPROVED Escape Chute Training (Skyscape). FALCK, Aberdeen, Scotland. Held on 24/10/2014. Valid until 23/10/2018.
- v) Oil & Gas UK Medical Certificate. Valid until 27/08/2016.

C) REFERENCES

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Prof. Johann Lutjeharms	UCT Oceanography	Tel. (021) 650 3979
Mr. Roy van Ballegooyen	CSIR	Tel. (021) 887 5101
Dr. Mike Lucas	UCT Marine Zoology	Tel. (021) 650 3603

Sea Fisheries Research Institute

Mr. Colin Attwood	SFRI	Tel. (021) 402 3190
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Werner Marine Research / Gal Marine

Dr. Yoav Eytam	Gal Marine	Tel. (021) 551 9564
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