

## CURRICULUM VITAE

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**RAY HOBBS** BSc, PhD, MIMarEST, CMarEng, CEng

**A highly qualified senior geotechnical engineer with extensive, world-wide experience in site investigation, design appraisal, installation and certification of a full range of offshore structures. An active member of international code making and special-interest committees and technical advisor to industry funded research projects. Chairman of Offshore Engineering Society 2001 - 2004**

## CAREER AND ACHIEVEMENTS TO DATE

### **Independent Geotechnical Consultant (July 2000 – date)**

Projects performed as an independent consultant include, *inter alia*:

- planning and on-site supervision of offshore and nearshore geotechnical site investigations worldwide
- site supervision of pile driving in extremely hard boulder clays West of Shetland
- site supervision of offshore wind farm pile driving test in chalk
- site supervision for suction installed conductor anchor node
- expert witness in court case on jack-up failure
- review for lawyers and loss adjusters of failure of wind turbine grouted connections
- review of reports for loss adjusters regarding failure of onshore pipeline over mountainous terrain
- relief geotechnical engineer in a major oil company office in Paris for 10 weeks
- detailed QC review of reports for site investigation contractors and consultants
- review of conductor installation procedures in normally consolidated clays
- review of conductor / foundation interaction
- review and prediction of jack-up spudcan penetrations
- review of gravity base design concepts for southern North Sea platform
- review of verification aspects of foundation design for platform West of Shetlands
- review of preliminary pile design for southern North Sea platform
- review of calculation methods for pile capacity in clays
- selection of design parameters for drilled and grouted piles in Middle East
- review of remedial actions for driven piles failing to meet their target depths in India
- review of pipeline routing
- review of alternative anchoring methods
- review of pile drivability predictions
- assist in preparation of pile drivability studies
- assist in preparation of design guide and spreadsheets for gravity base foundations

Clients to date include:

ADTI, Advanced Geomechanics, Aker Kvaerner, Apache, W S Atkins, Bateman Chapman (loss adjusters), BG, BG Norge, BP, BOMEL, Centrica Renewable Energy Ltd, CNR International (UK), Coflexip Stena Offshore International, Conoco, ConocoPhillips Norge AS, Coogee Resources (Australia), Crescent Petroleum (Sharjah), Dana, DONG, EDR (Australia), Endeavour, EnCana, Fishburns Solicitors, Floyd & Associates, Fugro Engineers BV, Gardline, Gas de France, Genesis Oil and Gas, Holman Fenwick Willan (solicitors), Isis Energy, Larsen & Toubro (India), London Array Ltd, London Offshore Consultants (Middle East), London Marine Consultants, Maersk Olie og Gas AS, Maersk Oil Qatar, National Grid, NAM, NeoDrill, Noble Denton, Norwegian Geotechnical Institute (NGI), Paladin Resources (Norway), Petro-Canada Netherlands, PowerGen Renewables, Hydrosearch Associates, RPS Energy, RWE npower Renewables, Seacore, Senergy, Shell Expro, Statoil, Talisman UK, TENAS, Thales GeoSolutions (UK and Belgium), Thanet Offshore Wind, Technip, Tuscan Energy, Total, Unocal Netherlands, Valiant Petroleum, Vanguard Floating Production, Venture Production and Woodside Energy Ltd.

Current, active member of ISO and API committees for writing or updating geotechnical sections of API RP2A and ISO 19902 (fixed offshore structures), API RP2GEO and ISO 19901-4 (geotechnical & foundation design), ISO 19901-8 (marine soil investigations), ISO 19905-1(jack-ups) and other codes for offshore structures. Member of interim OGP working group updating ISO standards. Member of BSI committee on offshore structures. Contributed to ISSMGE nearshore site investigation guidelines and to SUT Offshore Site Investigation and Geotechnics (OSIG) committee guidelines. Member of SUT OSIG committee, Offshore Engineering Society committee (Chairman 2001 – 2004) and IMarEST Technical Affairs committee (from 2006 - 2009). Member of British Geotechnical Association executive committee from 2004 – 2007. Member of organising committee and technical editor for SUT International Conferences on Offshore Site and Geotechnics 1992, 1998, 2002, 2007 and 2012. Member of organising committee for SUT/OES Offshore Windfarm Site Investigation Seminar 2003. Organiser and presenter of annual OES film evening at Institution of Civil Engineers, London since 2000

### **Head of Foundations Group, Lloyd's Register Offshore Engineering (1978-2000)**

Responsible for geotechnical design appraisal and installation approval of offshore structures in a wide variety of water depths and ground conditions, under both certification and verification schemes.

Experience includes selection of design parameters from site investigation data and performance of independent calculations for

- driven or drilled and grouted pile foundations for several hundred structures at both soil and rock sites, including many with carbonate materials
- suction installed piles
- piled foundations for first tension leg platform
- foundations for concrete gravity platforms
- foundations for jack-up rigs, articulated columns, moorings, subsea frames
- foundations for jetties, linkspans
- rock fill causeway
- pipelines
- grouted pile - structure connections
- anchors.

Familiar with application and limitations of new methods for calculating axial pile capacity.

Member of peer assist team reviewing foundations options for geotechnically challenging site, west of Shetlands.

Won and executed externally funded research projects, on, *inter alia*,

- the effect of conductor and shallow well drilling on foundation soils
- review of axial pile load test data and implications for design of offshore piles in both clay and sand

- seabed scour around jacket structures
- vibrations of jacket structures during pile driving.

Executed funded research on

- the dynamic behaviour of gravity base structures
- review of foundation performance of Shell Brent B and experimental Christchurch Bay gravity base structures.

Wrote finite element program for elasto-plastic analysis of gravity platform foundations and axially loaded piles. Directed the writing of pile driving analysis program.

Acted as Lloyd's Register surveyor for the installation or repair of over 80 offshore structures, including fixed steel platforms, subsea frames, SPMs and a TLP. These were situated in the UK, Eire, Netherlands, Spain, Abu Dhabi, South Africa, India, The Philippines, People's Republic of China and Australia. Responsibilities included monitoring and approving pile installation, grouting and welding activities and issuing Inspection Release Notes.

Attended installation of geotechnical instrumentation for gravity platform and TLP.

Attended site investigations offshore UK, The Netherlands, Egypt and India, acting as client representative on some.

Project adviser for industry-funded axial load tests on large diameter driven piles

- in normally consolidated and overconsolidated clays in the UK (BP)
- in dense sand in the Netherlands (EURIPIDES).

Consultant to UK Department of Energy / HSE on same.

Member of

- Department of Energy Steering Group for Offshore Piling
- Committee for re-draft of Department of Energy Guidance Notes for Offshore Installations (Foundations and Site Investigations)
- BSI Committee on Draft for Development for Fixed Offshore Structures
- Canadian Standards Technical Committee S472
- ISO and API committees
- SUT Offshore Site Investigation and Geotechnics committee

Published and presented several papers on offshore and onshore geotechnics

### **Soils Engineer, Lloyd's Register Offshore Services (1974-1978)**

Geotechnical design appraisal and installation approval of offshore structures

## QUALIFICATIONS

Chartered Marine Engineer  
Chartered Engineer, 1978  
PhD in Engineering (Soil Mechanics), University of Manchester, 1974  
BSc in Civil Engineering, 1st Class Honours, University of Manchester, 1971

## CURRENT PROFESSIONAL MEMBERSHIPS

Institute of Marine Engineering Science and Technology (Chartered Engineer,  
Chartered Marine Engineer, Technical Affairs Committee 2006 – 2009)  
Offshore Engineering Society (committee member 2000 – present, Chairman 2001 - 2004)  
British Geotechnical Association (executive committee member 2004 - 2007)  
International Society for Soil Mechanics and Geotechnical Engineering  
Institution of Civil Engineers (graduate member)  
Various ISO and API geotechnical committees and working groups including those drafting new  
ISO 19901-8 marine soil investigation code and new ISO 19905-1 jack-up code  
Interim OGP working group developing ISO standards  
British Standards Institution committee B/525/12 on design of offshore structures  
SUT Offshore Site Investigation and Geotechnics committee

## CONTINUING PROFESSIONAL DEVELOPMENT

Regular attendee at technical meetings of Offshore Engineering Society, British Geotechnical Association, British Tunnelling Society, Society for Earthquake and Civil Engineering Dynamics, Geological Society of London, Institution of Civil Engineers, Institute of Marine Engineering Science and Technology, Royal Institute of Naval Architects, Society of Naval Architects and Marine Engineers, *etc.* Committee memberships as above.  
Attended Lloyd's Register Middle Management course and LR courses on NDE and IT

## EDUCATION

### University of Manchester

PhD in Engineering (Soil Mechanics). Numerical and centrifuge modelling of soil slopes. Included writing non-linear elasto-plastic finite element programs and using geotechnical centrifuge.  
BSc in Civil Engineering. Final year specialisations in soil mechanics and hydraulics.  
Awarded Institution of Civil Engineers Prize

### Wallingford Grammar School

GCE A levels in Mathematics, Further Mathematics and Physics  
Awarded Walter Bigg Prize for physics

## OTHER RELEVANT DATA

Current Oil and Gas UK medical certificate for working offshore  
UK and European offshore survival course certificates valid until June 2018  
OPITO offshore oil & gas industry Minimum Industry Safety Training  
Lloyd's Register non-destructive examination course certificate  
Current UK driving licence and passport

## PERSONAL DETAILS

British                      Born 16 August 1950

## **PUBLISHED PAPERS, DISCUSSIONS AND ARTICLES**

- 2012 Technical Editor: Proc. Offshore Site Investigation and Geotechnics Conference, SUT (with others)
- 2009 Discussion on: Observed Increases in Offshore Pile Driving Resistance, Proc. ICE, Geotechnical Engineering, 162, pp293-294
- 2007 Technical Editor: Proc. Offshore Site Investigation and Geotechnics Conference, SUT (with others)
- 2007 Offshore Site Investigation - Some Insights into the Role of a Client Representative, Proc. Offshore Site Investigation and Geotechnics Conference, SUT, September 2007
- 2004 Site Investigation Matters, Offshore Wind Section, UK Power, Issue 1, March, McMillan-Scott, p22
- 2002 Technical Editor: Proc. Offshore Site Investigation and Geotechnics Conference, SUT (with others)
- 1998 Technical Editor: Proc. Offshore Site Investigation and Foundation Behaviour Conference, SUT (with others)
- 1998 The Impact of Conductor and Shallow Well Drilling on the Safety of Offshore Foundations, Proc. Conference on Offshore Site Investigation and Foundation Behaviour - New Frontiers, SUT (with DWF Senner)
- 1994 Drilling and Conductor Installation Effects on Foundation Safety, Health & Safety Executive Report OTO 94 005 (with DWF Senner)
- 1994 Discussion on: Mechanisms of Shaft Friction in Sand from Instrumented Pile Test, ASCE Journal of Geotechnical Engineering, 120:8, p1449
- 1993 Foundations Problems Encountered During The Installation of Piled Offshore Structures - A Certifying Authority's Experiences, Proc. Offshore '93 Conference (with JL Price)
- 1993 Technical Editor: Proc. Offshore Site Investigation and Foundation Behaviour Conference, SUT (1992) (with others)
- 1993 A Review of Design and Certification of Offshore Piles with Reference to Recent Axial Pile Load Tests, Proc. Conference on Offshore Site Investigation and Foundation Behaviour, SUT (1992)
- 1993 The Impact of Axial Pile Load Tests at Pentre and Tilbrook on the Design and Certification of Offshore Piles in Clay, Proc. Conference on Recent Large Scale Fully Instrumented Pile Tests in Clay, ICE, London, pp 491 - 510
- 1992 Pile Driving Vibrations Database, Health & Safety Executive Report OTO-92-008 (with J Waller)
- 1989 Certification of Offshore Structures Founded on Carbonate Soil, Proc. 8th Conference on Offshore Mechanics and Arctic Engineering, Vol. 1, pp 541 - 548 (with JL Price)
- 1986 Discussion on: Reinterpretation of the West Sole Platform "WC" Pile Load Tests, Geotechnique, 35:3, pp 461 - 462
- 1984 Discussion on: Scale Effects of Ultimate Pile Capacity, Proc. ASCE, 110:GT, pp 1155 - 1156
- 1983 Discussion on: Effective Stress Capacity Model for Piles in Clay, Proc. ASCE, 109:GT, pp 1213 - 1214
- 1980 Discussion on: Installation of the Piled Foundation and Production Modules on Occidental Piper A platform, Proc. ICE
- 1979 Elasto-Plastic Finite Element Analyses of Axially Loaded Piles in Clay, Proc. Conference on Numerical Methods in Offshore Piling, ICE, London, pp 191 - 195

- 1979 Discussion on Pile Drivability, Proc. International Conference on Numerical Methods in Offshore Piling, ICE, London, pp 177 - 178
- 1979 Report on Informal Discussion: Computer Graphics in Civil Engineering, Proc. ICE, 1:66, p 806
- 1979 Discussion on the Dynamic Response of Gravity Platforms, Offshore Geotechnical Research, Proc. of Symposium held at BRE
- 1978 An Investigation into the Dynamic Response of Gravity Platforms with Emphasis on Foundation Behaviour, Department of Energy report OT-R-7840 (with AD Coates and CA Bainbridge)
- 1978 Some Applications of Numerical Methods to the Design of Offshore Gravity Structure Foundations, Numerical Methods in Offshore Engineering, Editors Zienkiewicz, Lewis and Stagg, Ch14, pp 452 - 482 (with PJ George and GGW Mustoe)
- 1977 Analytical and Field Data Studies of the Dynamic Behaviour of Gravity Offshore Structures and Foundations, Offshore Technology Conference, Paper OTC 3008 (with PGH Shaw, AD Coates and WS Schumm)
- 1976 Discussion on: Consolidation Analysis of Layered Anisotropic Foundations, International Journal of Numerical & Analytical Methods in Geomechanics, Vol.1, p 407
- 1976 Biot Analysis of Consolidation Beneath Embankments, Geotechnique 26:1, pp 149 - 171 (with IM Smith)
- 1976 Discussion on: Settlement and Stability of Embankments Constructed on Soft Alluvial Soils, Proc ICE, 2:61, pp 604 - 606
- 1975 Finite Element Analyses of Centrifuged Soil Slopes, PhD Thesis, University of Manchester
- 1974 Finite Element Analysis of Centrifuged and Built-up Slopes, Geotechnique 24:4, pp 531 - 559 (with IM Smith)

## OFFSHORE & SITE VISITS

### As Lloyd's Register engineer:

	<b>DATES</b>	<b>PROJECT</b>	<b>LOCATION</b>	<b>CONTRACTOR</b>	<b>VESSEL</b>	<b>PURPOSE</b>
1976	15/02 - 19/02	Occidental Flotta SPM	UK	Micoperi	PM 40	Lateral load test
	24/03 - 30/03	Occidental Piper A	UK	McDermott	on platform	Drilled pile installation
	24/03 - 30/03	Occidental Piper A	UK	Fugro-Cesco	on platform	Site investigation
	30/06 - 06/07	BP West Sole	UK	Wimpey	Transocean 4 jack-up	Remedial pile installation
1977	10/02 - 16/02	Shell Inde L	UK	Heerema	Thor	Platform installation
	26/02 - 14/03	Shell Castellon B5 SALS	Spain	Nautilus	Staflo	Installation, including drilled piles
	27/05 - 30/05	Chevron Ninian South	UK	Heerema	Odin	Platform installation
	06/06 - 10/06	Chevron Ninian South	UK	Heerema	Odin	Platform installation
	25/08 - 08/09	Marathon Kinsale A	Eire	Micoperi	Crawler	Platform installation, including drilled piles
1978	16/01 - 18/01	Elf Frigg CDP1 (GBS)	UK	SymineX	on platform	Geotechnical instrumentation
	09/03 - 01/04	ONGC Bombay High F	India	Nippon Steel	Kuroshio 2	Platform installation
	15/04 - 24/04	Pennzoil K13C, K13D	Netherlands	Heerema	Champion	Platform installation
1979	12/04 - 10/05	ONGC Bombay High NI	India	ETPM	TBA	Platform installation
	20/08 - 07/09	Conoco Murchison	UK	Heerema	sscv Balder	Platform installation
	15/10 - 16/11	ONGC Bombay High NK	India	ETPM	DB 502	Platform installation
1980	18/04 - 20/05	ZADCO Upper Zakum N Satellite	Abu Dhabi	ETPM	DB 502	Platform installation, including drilled piles
		Upper Zakum PC42, PS64, PS50	Abu Dhabi	NPCC	SEP 250 jack-up	Platform installation, including drilled piles
	09/07 - 10/08	ZADCO Upper Zakum S Satellite	Abu Dhabi	ETPM	DB 401	Platform installation, including drilled piles
		Upper Zakum S Sat Flare Bridge Support	Abu Dhabi	ETPM	DB 401	Platform installation, including drilled piles
	08/09 - 11/09	HGB Morecambe Bay	UK	Fugro	Mariner	Site investigation
1981	24/01 - 25/02	ONGC Bombay High SE, SI	India	Micoperi	TBA	Platform installation
		ONGC Bombay High SU, SV	India	McClelland	Hemlock	Site investigation
	05/05 - 07/05	Douglas Harbour Ro-Ro jetty	Isle of Man	Navire	onshore	Site preparation
	27/05 - 20/07	Amoco / TII Cadlao SBM	Philippines	McDermott	DB 20	Pipelines, anchor pile installation
	19/10 - 27/10	Amoco North West Hutton	UK	McDermott	sscv DB 101	Platform installation
	02/11 - 11/11	Amoco North West Hutton	UK	McDermott	sscv DB 101	Platform installation
1982	06/01 - 07/02	ONGC Bombay High SJ,	India	Micoperi	TBA	Platform installation
		ONGC Bombay High SF	India	ETPM	TBA	Platform installation
	10/03 - 26/03	Maersk Valiant jack-up, Abu Qir	Egypt	D'Appolonia	Jaramac 57	Site investigation after rapid penetration of leg
	28/05 - 01/06	Union Helm	Netherlands	Heerema	sscv Hermod	Platform installation
	10/07 - 17/08	Woodside N Rankin A	W Australia	Heerema	Thor	Pile installation
	26/10 - 09/11	Woodside N Rankin A & NRA FSS	W Australia	Heerema	Thor	Pile installation
1983	04/04 - 20/04	Conoco Hutton TLP	UK	Heerema	sscv Balder	Foundation installation for tension leg platform

	15/06 - 22/07	Woodside North Rankin A & NRA FSS	W Australia	Dawson	on NRA platforms	Remedial pile plugging
	22/10 - 06/11	Woodside North Rankin A	W Australia	Dawson	on NRA platform	Remedial pile plugging
1984	03/05 - 14/05	Conoco Hutton TLP	UK	Wharton Williams Taylor	DSV Stephaniturm	Installation of seabed instruments by divers
	29/12 - 16/01	Shell SE Inde PD, SE Inde RD	UK	Heerema	sscv Balder	Platform installation
1985	10/03 - 14/03	Shell Inde M	UK	Heerema	sscv Hermod	Platform installation
	16/05 - 22/05	Shell SE Inde PP	UK	Heerema	sscv Hermod	Platform installation
	05/07 - 15/07	Amoco Rijnveld P15B	Netherlands	Heerema	sscv Balder	Platform installation
	01/12 - 20/12	ONGC Bombay High	India	McDermott	DB17	Platform installation
1986	18/02 - 22/02	Charterhouse L1A	Netherlands	Fugro	Bucentaur	Site investigation
	22/02 - 24/02	Unocal Q1-10	Netherlands	Fugro	Bucentaur	Site investigation
	29/05 - 13/06	Total North Alwyn B	UK	Heerema	sscv Hermod	Platform installation
	03/08 - 09/09	Woodside North Rankin A	W Australia	McDermott	Hugh Gordon/on platform	Remedial foundation work
1987	19/01 - 28/02	Woodside North Rankin A	W Australia	McDermott	Hugh Gordon/on platform	Remedial foundation work
	16/04 - 26/04	Conoco S.Valiant	UK	McDermott	sscv DB101	Platform installation
	26/04 - 10/05	Conoco LOGGS Accommodation	UK	McDermott	sscv DB101	Platform installation
	16/06 - 23/06	Conoco Vulcan 1	UK	McDermott	sscv DB101	Platform installation
	26/06 - 03/07	Marathon Brae B Flare	UK	Heerema	sscv Balder	Platform installation
	05/07 - 18/07	Mobil Beryl Template, Mobil Ness Template	UK UK	TBA TBA	High Seas Driller MG Hulme Jnr	Installation of subsea frames, including drilled piles Installation of subsea frames, including drilled piles
	01/09 - 04/09	BP Large Diameter Pile Tests, Pentre	UK	McClelland	onshore	Axial pile load tests in normally consolidated clay
	18/11 - 02/12	Conoco LOGGS Accommodation,	UK	McDermott	sscv DB101	Re-Installation of platform
	02/12 - 10/12	Conoco Vulcan 2	UK	McDermott	sscv DB101	Platform installation
1988	15/02 - 19/02	BP Large Diameter Pile Tests, Tilbrook	UK	McClelland	onshore	Axial pile load tests in overconsolidated clay
	30/03 - 17/04	Conoco N Valiant 2, N Valiant 1	UK	McDermott	sscv DB 102	Platform installation
	20/04 - 28/04	Conoco LOGGS Compression	UK	McDermott	sscv DB102	Platform installation
	12/10 - 03/11	Mobil Camelot CA Hamilton N Ravenspurn WT1	UK UK	Heerema Heerema	sscv Hermod sscv Hermod	Platform installation Platform installation
1989	25/04 - 03/05	HGB Morecambe Bay DP8	UK	Heeremac	sscv DB 102	Platform installation
	06/06 - 14/06	NAM K15-FS-1	Netherlands	Heeremac	sscv Hermod	Platform installation
	19/07 - 21/08	Agip Tiffany, Toni	UK	SAGE	Mariner	Site investigation
1990	11/03 - 18/03	Phillips Audrey 2	UK	Heeremac	sscv DB 102	Platform installation
	09/04 - 14/04	Conoco Viking BA	UK	Fugro McClelland	Bucentaur	Site investigation for platform
	28/05 - 05/06	Arco Welland	UK	Heeremac	sscv Hermod	Platform installation
	07/10 - 01/11	Mossgas Mossel Bay FA	South Africa	OPIC (Saipem)	sscv Micoperi 7000	Platform installation
1991	26/07 - 09/08	BP Miller	UK	Heeremac	sscv DB 102	Platform installation
	22/09 - 07/10	Conoco Viking BA	UK	Heeremac	sscv Hermod	Platform installation
1992	28/01 - 01/02	Conoco LOGGS Riser	UK	Fugro McClelland	Pholas	Site investigation for platform
	27/03 - 14/04	Amoco CATS Riser	UK	Saipem	sscv Micoperi 7000	Platform installation
	29/04 - 04/05	Conoco Lyell Manifold	UK	Heeremac	sscv DB 102	Installation of subsea frame
	13/07 - 31/07	Amoco North Everest Amoco CATS Riser	UK UK	Saipem Saipem	sscv Saipem 7000 sscv Saipem 7000	Platform installation Deck installation



1993	06/12 - 15/12	Phillips Hewett AQ	UK	Heeremac	sscv DB 101	Platform installation
	12/04 - 21/04	Shell Nelson	UK	Heeremac	sscv DB 102	Platform installation
	02/05 - 23/05	Marathon East Brae	UK	Heeremac	sscv DB 102	Platform installation
1994	28/05 - 16/06	Conoco LOGGS Riser	UK	Seaway Heavy Lifting	Stanislav Udin	Platform installation
	08/04 - 19/04	Mobil Excalibur EA	UK	Heeremac	sscv DB 102	Platform installation
	22/04 - 28/04	Shell Galleon PM	UK	Heeremac	sscv DB 102	Platform installation
	06/05 - 21/05	Arco Yacheng Wellhead	China	OHI / HHI	OHI 5000	Platform installation
1995	05/06 - 08/06	Shell Nelson WHPU C, WHPU D	UK	Rockwater	Rockwater Semi 1	Platform installation
	01/11 - 04/11	Hamilton Liverpool Bay CALRAM	UK	Fugro	Zealous	Site investigation for drag anchors
	14/01 - 22/01	Conoco Ganymede	UK	Fugro	Nedrill 4 jack-up	Site investigation from jack-up
	19/02 - 19/03	ACT HZ 32-2, HZ 32-3	China	Heeremac	sscv Hermod	Platform installation
	12/04 - 14/04	EURIPIDES pile tests, Eemshaven	Netherlands	Fugro / Geodia	onshore	Pile load tests in sand
	29/04 - 11/05	BHP Douglas Production, Hamilton, Liverpool Bay PLEM, Hamilton North	UK	Heeremac	sscv DB 102	Platform installation
			UK	Heeremac	sscv DB 102	Platform and subsea frame installation
			UK	Heeremac	sscv DB 102	Platform installation
	04/06 - 15/06	Conoco Ganymede	UK	Seaway Heavy Lifting	Stanislav Udin	Platform installation
	16/06 - 22/06	Arco Gawain WHPS	UK	Rockwater	Rockwater Semi 1	Platform installation
1996	22/06 - 22/06	Conoco Victor NW WHPS	UK	Rockwater	Rockwater Semi 1	Survey
	22/06 - 23/06	Conoco Victor JD Piggings Skid	UK	Rockwater	Rockwater Semi 1	Installation of subsea frame
	24/06 - 26/06	EURIPIDES pile tests, Eemshaven	Netherlands	Fugro/Geodia	onshore	Pile load tests in sand
	10/03 - 24/03	Texaco Erskine	UK	Saipem	sscv Saipem 7000	Platform installation
	29/04 - 16/05	BP Andrew	UK	Saipem	sscv Saipem 7000	Platform installation
	11/06 - 21/06	BP Cleeton	UK	Seaway Heavy Lifting	Stanislav Udin	Platform installation
	15/08 - 19/08	Wintershall Windermere	UK	McDermott-ETPM	DLB 1601	Platform installation
	16/10 - 05/11	Apache Campbell	W Australia	Transfield SCS	Ron Tappmeyer jack-up	Platform repair using grouted sleeve
	08/01 - 10/01	EURIPIDES pile tests, Eemshaven	Netherlands	Fugro/Geodia	onshore	Pile load tests in sand
	09/03 - 03/04	BG Armada	UK	Heeremac	sscv DB102	Platform installation
1998	18/04 - 26/04	Reliance Jamnagar	India	Afcons	onshore	Pile grouting tests,
		Reliance Jamnagar	India	Saipem	Micoperi 61 jack-up	Pile drilling
		Reliance Jamnagar	India	Saipem	on jetty under construction	Pile drilling
1999	22/05 - 30/05	Shell ETAP Egret, Heron, Skua	UK	Coflexip Stena	DSV Marianos	Suction pile installation
	09/01 - 14/01	Petrovietnam GUP II	Vietnam	Various	onshore	Site, fabrication yard
	18/01 - 28/01	Reliance Jamnagar	India	Saipem	on jetty under construction	Pile load tests
		Reliance Jamnagar	India	Saipem	Castoro 2, Castoro 7	Pile drilling
		Reliance Jamnagar	India	Saipem	Sea Ann	Pile grouting
	09/08 - 27/08	BG ECA Neptune, ECA Cleeton CR	UK	Heerema	sscv Thialf	Platform installation

**As independent consultant:**

	<b>DATES</b>	<b>PROJECT</b>	<b>LOCATION</b>	<b>CONTRACTOR</b>	<b>VESSEL</b>	<b>PURPOSE</b>
2001	03/02 - 19/02	Crescent Petroleum RAK C-1, UAQ-3, Sharjah 2	UAE	Fugro	Khawala 151	Site investigation for jack-ups and platform
	06/03 - 16/03	NAM G16 FA1, K02, G16 FA1 - K15 FA1 G1 pipeline, K02 FA1 pipeline	UAE Netherlands Netherlands Netherlands	Fugro Fugro Fugro Fugro	Khawala 151 Bucentaur Bucentaur Bucentaur	Site investigation for jack-ups and platform Site investigation for various infrastructure Site investigation for various infrastructure Site investigation for various infrastructure
2002	03/04 - 14/04	Maersk Halfdan A, BA, B, C	Denmark	Fugro	Bucentaur	Site investigation for jack-ups and platforms
	23/05 - 09/07	Maersk Al Shaheen AF, BC, CC, DA, DB, EA, EB, EC, FA, FB, SPM2, Well AP-13	Qatar Qatar Qatar	Thales Thales Thales	DSV Enad DSV Enad DSV Enad	Site investigation for various infrastructure Site investigation for various infrastructure Site investigation for various infrastructure
	23/09 - 17/10	Soekor Sable Development	South Africa	Fugro	Bavenit	Site investigation for various infrastructure
	16/05 - 17/05	Shell Nessie	UK	Fugro	Bucentaur	Site investigation for jack-up
	19/05 - 20/05	Maersk Boje-2	Denmark	Fugro	Bucentaur	Site investigation for jack-up
	20/05 - 21/05	TotalFinaElf 29/4b	UK	Fugro	Bucentaur	Site investigation for jack-up
	22/05 - 25/05	Conoco Brodgar, Callanish	UK	Fugro	Bucentaur	Site investigation for subsea templates
	07/10 - 02/11	Maersk Olga 1-X, Dan FG	Denmark	Seacore	Normand Flower	Site investigation for jack-up and platform
	02/11 - 07/11	DONG Siri-5, Sofie-1	Denmark	Seacore	Normand Flower	Site investigation for jack-up
	07/11 - 09/11	Tuscan Energy Ardmore SAL-1, SAL-2	UK	Seacore	Normand Flower	Site investigation for single anchor leg mooring
2004	17/11 - 01/12	Encana Buzzard	UK	Fugro	Bavenit	Site investigation for platforms
	22/04 - 28/04	NAM K17, K17 to K14 FA1 pipeline	Netherlands	Fugro	Bucentaur	Site investigation for various infrastructure
	04/05 - 25/05	Petro-Canada de Ruyter GBS	Netherlands	Seacore	Kingfisher	Site investigation for gravity base structure
2005	27/09 - 21/10	BP Valhall PH	Norway	Fugro	Bucentaur	Site investigation for platforms
	23/01 - 20/02	Apache 22/07	UK	Gardline	Noordhoek Singapore	Site investigation for jack-ups
	12/06 - 23/06	Novus West Bukha - 2	Oman	Noble Denton	Millenium 1	Site investigation for jack-up and platform
	02/07 - 17/07	Paladin Aimee, Hummer	Norway	UTEC	Aurelia	Site investigation for jack-ups
	17/07 - 19/07	Venture Kittiwake SAL	UK	UTEC	Aurelia	Site investigation for single anchor leg mooring
	27/07 - 06/08	Unocal A12 CPP	Netherlands	Fugro	Bucentaur	Site investigation for platform
	14/11 - 21/01	Woodside Pluto, Angel, Vincent	W Australia	Fugro	Markab	Site investigation for various infrastructure
	27/02 - 04/03	CNR Lyell Power Buoy	UK	UTEC	Esvagt Connector	Site investigation for subsea anchor
	04/03 - 13/03	TENAS Mime, Mimming, Varg SE	Norway	UTEC	Esvagt Connector	Site investigation for jack-up
2006	15/04 - 18/04	Centrica Lynn & Inner Dowsing wind farm pile driving test	UK	Mammoet van Oord	Jumping Jack	Test pile installation from jack-up
	09/10 - 31/10	BHP Billiton Pyrenees	W Australia	Fugro	Bavenit	Site investigation for various infrastructure
	01/11 - 22/11	Woodside Pluto, Western Flank	W Australia	Fugro	Bavenit	Site investigation for various infrastructure
		Woodside North Rankin B	W Australia	Fugro	Bavenit	Site investigation for platform, alongside North Rankin A
	26/01 - 30/01	ADTI / Ithaca Manuel	UK	Fugro	Bucentaur	Site investigation for jack-up
	31/01 - 03/02	BG Norge Pi North	Norway	Fugro	Bucentaur	Site investigation for jack-up
2007	12/02 - 13/02	TENAS Yme	UK	Fugro	Commander	Vessel mobilisation in UK

	28/05 - 03/06	ADTI / Endeavour Emu	UK	Fugro	Fugro Commander	Site investigation for jack-up
	06/07 - 28/08	Aker / Reliance Krishna Godvari D6-MA deepwater field development	India, Bay of Bengal	Fugro	Bavenit	Site investigation for various infrastructure (representing Norwegian Geotechnical Institute)
	27/09 - 06/10	TENAS Aubrey, Gyda TR3, Yme Beta	Norway	Fugro	Bucentaur	Site investigation for jack-up
	06/10 - 12/10	BG Norge Bream, Mandarin	Norway	Fugro	Bucentaur	Site investigation for jack-up
	12/10 - 16/10	ConocoPhillips Trane	Norway	Fugro	Bucentaur	Site investigation for jack-up
2008	07/12 - 08/01	LAL London Array offshore wind farm	UK	Fugro Seacore	Excalibur	Site investigation for wind farm, from jack-up
	03/02 - 14/02	LAL London Array offshore wind farm	UK	Fugro Seacore	Excalibur	Site investigation for wind farm, from jack-up
	14/02 - 02/03	TOW Thanet offshore wind farm	UK	Fugro Seacore	Excalibur	Site investigation for wind farm, from jack-up
	30/06 - 03/07	BG North Calloway	UK	Fugro	Bucentaur	Site investigation for jack-up
	03/07 - 12/07	TENAS Grevling, Optimus, TMN	Norway	Fugro	Bucentaur	Site investigation for jack-up
	12/07 - 20/08	CoPNo Ekofisk, Eldfisk	Norway	Fugro	Bucentaur	Site investigation for platforms and jack-ups
2009	28/09 - 09/10	Chrysaor Solan GBS	UK, W of Shetland	Gardline	Ocean Observer	Geophysical site investigation for gravity base structure
	11/06 - 12/07	RWE npower Triton Knoll wind farm	UK	Fugro Seacore	Excalibur	Site investigation for wind farm, from jack-up
	16/11 - 21/11	ADTI / Ithaca Stella	UK	Fugro	Bucentaur	Site investigation for jack-up
	21/11 - 26/11	ADTI / Encore Catcher	UK	Fugro	Bucentaur	Site investigation for jack-up
	26/11 - 09/12	Total West Franklin	UK	Fugro	Bucentaur	Site investigation for platform, jack-up and well
	09/12 - 12/12	Gaz de France Cygnus	UK	Fugro	Bucentaur	Site investigation for jack-up
	12/12 - 20/12	Centrica York	UK	Fugro	Bucentaur	Site investigation for jack-up
		Centrica Olympus	UK	Fugro	Bucentaur	Site investigation for platform and jack-up
2010	04/06 - 08/06	Valiant Viola	UK	Fugro	Maersk Attender	Site investigation for jack-up
	14/07 - 18/08	Nexen Golden Eagle	UK	Fugro	Bucentaur	Site investigation for jack-up, platforms, subsea struct's
	29/08 - 08/10	Woodside Browse	W Australia	Benthic Geotech	Mermaid Investigator	Site investigation for platform and pipelines using PROD2 seafloor drill rig
	07/11 - 17/12	Woodside Browse	W Australia	Benthic Geotech	Mermaid Investigator	Site investigation for platform and pipelines using PROD2 seafloor drill rig
2011	04/07 - 30/07	Apache Julimar	W Australia	Fugro	Southern Supporter	Site investigation for pipelines and manifolds including environmental survey and inspection of existing pipeline
	20/12 - 05/01	Statoil Åsgard, NSGI	Norway	Fugro	Bucentaur	Site investigation for pipelines including inspection of existing pipelines
2012	12/06 - 11/07	Centrica Irish Sea Round 3 South East Area	UK	Fugro	Normand Mermaid	Regional site investigation for wind farm development
	01/08 - 06/08	Dana Pharos	UK	Fugro	Markab	Site investigation for jack-up
	06/11 - 16/11	BG Thunderer	UK	Fugro	Bucentaur	Site investigation for jack-up
2013	24/02 - 28/02	ADTI / National Grid Humber P1 carbon capture and storage well	UK	Fugro	Gargano	Site investigation for jack-up
	28/02 - 02/03	E.On Tolmount	UK	Fugro	Gargano	Site investigation for jack-up
	07/06 - 27/06	BP Clair Ridge DP platform	UK, W of Shetland	Heerema	sscv Thialf	Jacket installn & piling in extremely hard boulder clays
2014	12/06 - 17/06	NeoDrill / Centrica Ivory CAN	Norway	DOF	Normand Reach	Installation of suction-installed conductor anchor node

