

## Drilling engineer

### Job Description

A drilling engineer develops, plans, costs, schedules and supervises the operations necessary to the process of drilling oil and gas wells, from initial well design to testing, completion and abandonment. Engineers are employed on land, on offshore platforms or on mobile drilling units, either by the operating oil company, a specialist drilling contractor or a service company.

The role can involve administering drilling and service contracts, engineering design and the planning of wells, and supervising the drilling crew on site.

Drilling engineers work with other professionals, such as geologists and geoscientists, to monitor drilling progress, oversee safety management and ensure the protection of the environment.

### Typical Work Activities

Typical work activities include:

- preparing well data sheets;
- designing and selecting well-head equipment;
- drawing up drilling programmes, taking account of desired production flow rates;
- obtaining relevant data, carrying out analysis on site and recommending immediate actions as necessary;
- carrying out full engineering analyses of rig site data and preparing regular well reports;
- monitoring the daily progress of well operations and current daily costs, comparing actual costs with cost expenditure proposals and recommending changes or improvements to rig work techniques, which could lead to optimisation of expenditure;
- liaising with specialist contractors and suppliers, such as cement companies or suppliers of drilling fluids;
- monitoring safety and ensuring the good maintenance of the well;
- adhering to environmental protection standards, in some cases through direct discussion with local governments to ensure compliance with legislative requirements;
- establishing and administering drilling and service contracts;
- co-ordinating and supervising the work of the drilling team;
- undertaking engineering design and the planning of wells (including development work);
- designing directional well paths (horizontally or multi-laterally, as appropriate);
- managing operations on behalf of small clients;
- contributing to conceptual field development design;
- working with multidisciplinary professionals to evaluate the commercial viability of the well and monitor progress during drilling;
- returning the site to its natural environmental setting if drilling is not to be pursued.

### Work Conditions

- Range of typical starting salaries: £26,000 - £32,800 (salary data collected Aug 07). These relate to international oil company graduate training programmes, with the highest figure available to holders of a relevant PhD. Salaries in smaller companies are likely to be lower.
- Range of typical salaries after 15 - 20 years in the role: £53,000 - £75,000+ (salary data collected Aug 07).
- Salary is usually performance-related. Location and assignments influence salary. Additional fringe benefits and overseas allowances may be available. Oil drilling takes place in some dangerous areas of the world - in these situations, extra payments may be made.
- In the North Sea, offshore working hours are normally 12 hours on and 12 hours off continuously for two weeks, followed by a break ashore of two to three weeks. You may be summoned to work on a rig at short notice.
- The work on offshore rigs is demanding and physically hard, often undertaken in dirty, wet and noisy conditions, and in bad weather.
- Self-employment/freelance work on contract (formerly more common) is sometimes possible. Opportunities to work in this way may increase if the demand for personnel increases.
- There is currently a low proportion of women in this profession, but the numbers are increasing.
- Living conditions on most rigs are very comfortable, described as five star hotel standard, catering for 50-100 people. Rooms are compact, but comfortable, and frequently shared with a colleague working the opposite twelve-hour shift, so you will rarely see your room-mate. All meals and laundry services are provided. Regular facilities include a gym and snooker room, with access to computers and DVDs. Alcohol is prohibited on the rig.
- The work could be difficult for entrants with a physical disability as all offshore rig personnel must pass tests of physical fitness, survival and escape from a submerged helicopter.
- Offshore operations take place in many parts of the world (high seas, remote jungles, vast deserts and mountain ranges). In some settings, you may be working for several months at a time without a break. You will need to be prepared to accept considerable disruption to your personal and home life. Communal living with the same set of people means you need to get on well with others, both in and outside the work situation.
- Travel to the different rigs by helicopter is normal, sometimes at short notice, so flexibility is required. Travel to sites in other parts of the world can be complex and difficult.

### Entry Requirements

Although this area of work is open to all engineering graduates, the following subjects may increase your chances:

- mechanical engineering;
- petroleum engineering;
- marine engineering;
- mineral engineering;
- civil/structural engineering;
- chemical/process engineering;
- electrical/electronic engineering (rarely).

A degree in geology or natural sciences may also be advantageous. A good first degree (minimum 2:1) is required for entry to major oil companies' graduate training programmes, and undergraduate masters (MEng) degrees are usually preferred. Entry with an HND alone is not possible.

A relevant pre-entry postgraduate qualification can be useful, but is not, due to the level of competition, a guarantee of a job. Any student considering postgraduate study should investigate carefully the need for and relevance of the proposed course to their intended career. An MSc in petroleum or offshore engineering, for example, may improve your chances.

Pre-entry experience is not essential, but any experience of working on rigs or in an onshore yard is likely to be useful and will demonstrate your interest and motivation.

Potential candidates will need to show evidence of the following:

- strong communication and interpersonal skills, and the ability to build and maintain relationships with a wide range of people;
- a good technical understanding of the scientific principles of other disciplines, such as geology, physics, maths and chemistry;
- a high level of numeracy and good IT skills;
- the analytical ability to think through potentially complex problems and develop solutions;
- initiative and drive;
- teamworking skills and the ability to co-operate with others;
- sensitivity to different cultures and ways of working;
- the ability to work under pressure.

Given the international nature of the work, a basic knowledge of foreign languages can be useful.

Some major oil companies and contractors offer placements during the summer vacation of your penultimate year to work on a project of operational significance. Successful completion of the project may give you an advantage in the recruitment process for a permanent post.

Major oil companies advertise vacancies almost a year in advance, but it is also worth making speculative applications to specialist companies directly. Competition is keen and recruitment is affected by oil price fluctuations. You may find initial entry to the industry easier as a Mudlogger before moving up the ranks to drilling engineer.

The exploration and extraction business is worldwide. Many of the jobs are based overseas, so major employers recruit internationally. Many applicants come from the United States and Europe, where university education lasts longer and a higher degree is the normal qualification for entry to a professional career.

Normal entry is as a new graduate or in the early stages of your career.

It is illegal for employers to discriminate against candidates on the grounds of age, gender, race, disability, sexual orientation or religious faith. For more information on equality and diversity in the job market see Handling Discrimination ([www.prospects.ac.uk/links/discrimination](http://www.prospects.ac.uk/links/discrimination)).

### Training

Formal training in areas specific to the job, as well as more general management skills, complements practical, hands-on, rig-site experience. Major oil companies have well-established graduate training programmes, which meet the requirements of the professional engineering institutions in gaining chartered engineer (CEng) status through bodies such as the Institution of Mechanical Engineers (IMechE) ([www.imeche.org](http://www.imeche.org)), the Institution of Chemical Engineers (IChemE) ([cms.icheme.org](http://cms.icheme.org)) or the Institute of Materials, Minerals and Mining (IOM3) ([www.iom3.org](http://www.iom3.org)).

A mentoring system is often available to allow new graduates to access the advice and professional support of more senior engineers. Continuing professional development (CPD) is supported at a variety of locations, allowing graduates to build networks with international colleagues. Study facilities are also available offshore on oil platforms.

If you are working for a smaller company, you may find that you will need to take responsibility for arranging and funding your own development and training, particularly if you are employed on a temporary contract basis.

Safety and survival training is obligatory. This usually takes three to five days and is carried out at specialist training facilities in Aberdeen. The course covers first aid, survival training, general safety and environmental awareness. Participants must pass an underwater helicopter escape course, which involves submersion and escape from an upturned helicopter simulator.

### Career Development

If you begin your drilling engineering career with one of the large oil companies, you will at first manage a single well under supervision. However, fairly quickly, you could become responsible for wells involving budgets of £5-10million. As you gain in experience and seniority, you could have overall supervision for the drilling and production operations on several wells, initially offshore and then moving onshore.

A typical career path could mean working for two to four years offshore or on an onshore wellsite in, for example, the Middle East, and then moving into an office-based design role, which could, in the future, mean working in an overseas office following a one month on, one month off pattern.

Career progression is usually into management in oil companies. However, in drilling contractors, engineers tend to remain in a technical role, using their expertise to access and develop the most appropriate technology for drilling in the future. Independent consultancy is another option, although you will need to work hard to balance the good times with the less prosperous periods.

Drilling is the aspect of oil exploration most affected by the economic climate, which may affect opportunities for career development. Activity is in response to the decisions of the oil companies as to where drilling will take place. North Sea sites are currently being transferred to smaller developers, as the major fields become less economic and large companies are increasingly looking to new prospects overseas.

### Typical Employers

The UK offshore oil and gas industry only began in the 1960s and so is still a relatively new area of employment. All the largest and most easily developed oil fields have now been discovered and are now past their production peak. In the UK, activity is currently located mainly off the east coast of England and Scotland, but exploration is also being carried out in the western approaches, the Irish Sea and west of the Shetlands. Oil production generally has peaked and is now declining gradually, although gas production is still rising and both will last well into the current century according to the Oil and Gas UK ([www.oilandgasuk.co.uk](http://www.oilandgasuk.co.uk)).

Oil exploration is an international activity and the work of a drilling engineer can take you all over the world, from Africa to Eastern Europe and the Middle East. Typical employers include:

- operating/producing companies, especially large international oil companies, although some are smaller and less well-known;
- engineering consultancies;
- integrated service providers, providing staff in varied disciplines;
- specialist drilling contractors, undertaking drilling work on an international scale and often operating and maintaining their own mobile drilling rigs.

In the extraction phase, it is important to recognise that recruitment, training patterns and job titles vary from company to company. For example, some employers do not distinguish at entry level between petroleum, drilling and support engineering. Instead, they prefer to recruit people with wide potential and deploy them after training where individual preference and company need coincide.

### Sources of Vacancies

- Prospects Directory;
- Prospects Finalist ([www.prospects.ac.uk/links/finalist](http://www.prospects.ac.uk/links/finalist));
- Offshore Engineer ([www.oilonline.com/oe](http://www.oilonline.com/oe));
- Oil Online ([www.oilonline.com](http://www.oilonline.com));
- Earthworks ([www.earthworks-jobs.com](http://www.earthworks-jobs.com));
- Rigzone ([www.rigzone.com](http://www.rigzone.com));
- Press and Journal ([www.pressandjournal.co.uk](http://www.pressandjournal.co.uk));
- Oil Careers ([www.oilcareers.com](http://www.oilcareers.com));
- Oil and Gas Jobs Online ([www.oilandgasjobsonline.com](http://www.oilandgasjobsonline.com));
- InfoOil Careers ([www.infooil.com](http://www.infooil.com));
- the careers sections of major oil and gas companies' websites, for details of their graduate recruitment schemes.

Speculative applications to specialist companies can be a good way into work. Check out the Drilling Engineer Association Europe (DEAe) ([www.dea-europe.com](http://www.dea-europe.com)) and also the International Association of Drilling Contractors (IADC) ([www.iadc.org/](http://www.iadc.org/)) for appropriate contacts.

You may find the Recruitment and Employment Confederation (REC) ([www.rec.uk.com](http://www.rec.uk.com)) helpful in identifying specialist agencies that handle vacancies for both temporary and permanent contracts. Select 'Oil and Gas' from the drop down menu in the 'Industry Type' search.

### Related Occupations

- Chemical development engineer
- Hydrographic surveyor
- Mechanical engineer
- Mining engineer
- Mudlogger
- Petroleum engineer

## Information Sources

### Bibliography

AGCAS and Graduate Prospects products are available from higher education careers services.

#### AGCAS Publications

[Energy and Utilities Sector](#), AGCAS Sector Briefing  
[Engineering Sector](#), AGCAS Sector Briefing  
[Handling Discrimination](#), AGCAS Information Booklet  
[Options with Chemical Engineering](#), AGCAS Options Series  
[Options with Civil Engineering](#), AGCAS Options Series  
[Options with Mechanical Engineering](#), AGCAS Options Series

#### Graduate Prospects Publications

Prospects Directory  
[Prospects Finalist](#)

#### Other Publications

*Britain's Offshore Oil and Gas*, [Oil and Gas UK](#), 2nd edition  
*Energy World*, [Energy Institute](#), 10 issues pa  
*Global Oil and Gas Directory*, [Marketing Communications Media \(MCM\)](#), Annual  
*Journal of Petroleum Technology (JPT)*, Society of Petroleum Engineers, Monthly  
*Offshore*, Pennwell Publishing (UK) Ltd, Monthly  
*Offshore Engineer*, Atlantic Communications, Monthly  
*Oil and Gas Journal*, Pennwell Publishing (UK) Ltd, Weekly  
*Petroleum Review*, [Energy Institute](#), Monthly  
*Press and Journal*, Aberdeen Journals Ltd, Daily

### Websites

*Drilling Engineer Association Europe (DEAe)*, [www.dea-europe.com](http://www.dea-europe.com)  
*Earthworks*, [www.earthworks-jobs.com](http://www.earthworks-jobs.com)  
*InfoOil Careers*, [www.infooil.com](http://www.infooil.com)  
*International Association of Drilling Contractors (IADC)*, [www.iadc.org/](http://www.iadc.org/)  
*Oil Careers*, [www.oilcareers.com](http://www.oilcareers.com)  
*Oil Directory*, [www.oildirectory.com](http://www.oildirectory.com)  
*Oil and Gas Jobs Online*, [www.oilandgasjobsonline.com](http://www.oilandgasjobsonline.com)  
*Oil Online*, [www.oilonline.com](http://www.oilonline.com)  
*Petroleum Economist*, [www.petroleum-economist.com](http://www.petroleum-economist.com)  
*Recruitment and Employment Confederation (REC)*, [www.rec.uk.com](http://www.rec.uk.com)  
*Rigzone*, [www.rigzone.com](http://www.rigzone.com)  
*Subsea UK*, [www.subseaskills.co.uk](http://www.subseaskills.co.uk)

### Addresses

*Cogent: The Sector Skills Council for Chemicals, Pharmaceuticals, Nuclear, Oil and Gas, Petroleum and Polymers*, Unit 5, Mandarin Court, Centre Park, Warrington, Cheshire WA1 1GG Tel: 01925 515 200 URL: [www.cogent-ssc.com](http://www.cogent-ssc.com)  
*Energy Institute*, 61 New Cavendish Street, London W1G 7AR Tel: 020 7467 7100 URL: [www.energyinst.org.uk/](http://www.energyinst.org.uk/)  
*Institute of Materials, Minerals and Mining (IOM3)*, 1 Carlton House Terrace, London SW1Y 5DB Tel: 020 7451 7300 URL: [www.iom3.org](http://www.iom3.org)  
*Institution of Chemical Engineers (IChemE)*, Davis Building, 165-189 Railway Terrace, Rugby CV21 3HQ Tel: 01788 578214 URL: [cms.icheme.org](http://cms.icheme.org)  
*Institution of Mechanical Engineers (IMechE)*, 1 Birdcage Walk, Westminster, London SW1H 9JJ Tel: 020 7222 7899 URL: [www.imeche.org](http://www.imeche.org)  
*Oil and Gas UK*, 2nd Floor, 232-242 Vauxhall Bridge Road, London SW1V 1AU Tel: 020 7802 2400 URL: [www.oilandgasuk.co.uk](http://www.oilandgasuk.co.uk)  
*Petroleum Exploration Society of Great Britain (PESGB)*, 5th floor, 9 Berkeley Street, London W1J 8DW Tel: 020 7408 2000 URL: [www.pesgb.org.uk](http://www.pesgb.org.uk)  
*SEMTA: the Sector Skills Council for Science, Engineering and Manufacturing Technologies*, Head Office, 14 Upton Road, Watford WD18 0JT Tel: 01923 238 441 URL: [www.semta.org.uk](http://www.semta.org.uk)  
*Society of Petroleum Engineers*, Part Third Floor East, Portland House, 4 Great Portland Street, London W1W 8QJ Tel: 020 7299 3300 URL: [www.spe.org](http://www.spe.org)  
*UK Petroleum Industry Association (UKPIA)*, 9 Kingsway, London WC2B 6XF Tel: 020 7240 0289 URL: [www.ukpia.com](http://www.ukpia.com)