Unitisation – The Oil and Gas Industry’s Solution to One of Geology’s Many Conundrums

Friday, August 29, 2014

Geology, and nature in general, are never perfect. Given the migratory nature of oil and gas, a hydrocarbon reservoir will often straddle two or more licence or contract areas; indeed, in certain instances, a hydrocarbon reservoir may even straddle international borders.

One of the primary objectives of host governments and international oil companies (“IOCs”) is to maximise the economic recovery of petroleum from the “common” hydrocarbon reservoir. Unitisation is an approach which the oil and gas industry has developed to ensure that, to the extent possible, this is achieved.

This article presents a general overview of the principles of unitisation, how unitisation is commonly documented in the United Kingdom Continental Shelf (“UKCS”) and what issues generally need to be considered by IOCs when embarking on a unitisation, particularly in the UKCS. The article does not compare unitisation regimes in various international jurisdictions or those situations where cross border unitisations are necessary; these and other specific aspects of unitisation will be discussed in a future edition of Notes From The Field.

What is unitisation?

In essence, unitisation is the joint development of a hydrocarbon reservoir which extends across two or more licence or contract areas (if the field is governed by a production sharing contract regime) in order to ensure the efficient production of the reservoir and to maximise the economic recovery of petroleum from such licences of the contract areas. The net effect of this is that each licence group agrees that the licence or contract areas are aggregated as a “unit”, with each owner receiving a percentage interest in the unit (“unit interest”).

Graphically, a unitisation is illustrated below.

The development of the concept of unitisation

The concept of unitisation originated in the US. In the early twentieth century, the concept of unitisation did not exist and instead the concept of the “rule of capture” applied.

The rule of capture is the situation in which “the owner of a tract of land acquires title to the oil and gas which he produces from wells drilled thereon, though it may be proved that part of such oil or gas migrated from adjoining lands.”

Many cases in the US have illustrated the practical application of the rule of capture. One of the best known cases is Barnard v Monongahela Natural Gas Company where the Monongahela Natural Gas Company leased oil and gas drilling and operation rights from two adjacent landowners under separate leases. The company drilled a well in close proximity to the property of one of the landowners that was estimated to extract gas from an area that was 75% under the land belonging to the other landowner.

The landowner applied to the court for an injunction restraining the company from depleting the reservoir;
however, the court refused to grant the injunction. The court noted that:

“Every landowner or his lessee may locate his wells wherever he pleases regardless of the interests of others. He may distribute them over the whole farm or locate them only on one part of it. He may crowd the adjoining farms so as to enable him to draw the oil and gas from them. What then can his neighbour do? Nothing; only go and do likewise, he must protect his own oil and gas. He knows it is wild and will run away if it finds an opening and it is his business to keep it at home.”

One effect of this ruling, among others, was the creation of a highly competitive practice of drilling in the US, with each landowner drilling as many wells on his land as possible in order to ensure maximum production from his part of a field, even going so far as to drill on the very edge of the lease line in the hope of extracting oil or gas which may have migrated from his or her neighbour’s land.

Competitive drilling of this nature led to waste and inefficiency as a consequence of the duplication of effort and the construction of extra facilities; this led to sub-optimum recovery due to poor management of the hydrocarbon reservoir which in turn reduced revenue to the grantors of the leases.

To combat this, the concept of unitisation was developed in the US and subsequently adopted by IOCs in a number of other jurisdictions, including the UK.

**The UK approach to unitisation**

The issue of whether the rule of capture applies in the UK is uncertain, with commentators putting forward arguments to support its application or disapplication. There is an absence of case law which directly addresses this question with respect to hydrocarbons.

In the UK, the Secretary of State for Energy and Climate Change has powers to impose unitisation between licensees if it is in the national interest for the purposes of ensuring maximum recovery of petroleum and to avoid unnecessary competitive drilling. In particular, section 4 of the Petroleum Act 1998 grants the Secretary of State powers to make regulations prescribing the model clauses unless “he thinks fit to modify to exclude them in any particular case” be incorporated in any such licence.

As noted in Issue 3 of Notes From The Field, the licence in the UK takes the form of a deed under which the licensee is bound to observe the terms and conditions of the licence as set out in secondary legislation known as the “model clauses”. The model clauses applicable to a particular licence are those which are in force at the time the licence is granted.

Clause 27(2) of the model clauses applicable to seaward production licences is the relevant model clause which needs to be considered when understanding how unitisation works in the UK.

The UK government’s role in the unitisation process can be summarised as follows: If any Licensee objects to the development scheme, such Licensee has 28 days from the date of the written notice of receipt of the development scheme from the Secretary of State to refer the matter to arbitration in accordance with model clause 43.

What does this mean in practice for licensees in the UK?

The Department of Energy and Climate Change (“DECC”) has published guidance notes which explain DECC’s position with respect to unitisation; UKCS licensees who are faced with a potential unitisation should read the applicable legislation together with the guidance notes carefully.

Where a field development plan is proposed for a field which extends into an area covered by a licence with multiple licensees, DECC needs to be satisfied that “the ultimate recovery of petroleum is maximised and that unnecessary competitive drilling is avoided.” DECC encourages licensees to discuss their unitisation plans with neighbouring licensees and to propose an agreed field development plan in order to avoid delays in the application and authorisation process.

The DECC guidance notes also emphasise that the proposed field development plan can either be a “unitised development or other commercial arrangement” and that the plan should demonstrate that “there would be no risk of unnecessary competitive drilling.”

With respect to documenting the unitisation, the DECC guidance notes state that “the Secretary of State will not necessarily refuse to grant development authorisation to a particular group of licensees who have not concluded

```
an agreement with the licensees of an adjacent block on the basis that they have not concluded a unitisation agreement”.

DECC’s position in this regard is beneficial to parties seeking to enter into such an arrangement as documenting a unitisation takes significant time and effort from all parties as noted below.

**Documenting unitisation**

**The preunitisation agreement**

Before entering into a fully-termed unitisation agreement, parties may decide to enter into a preunitisation agreement. Preunitisation agreements are a useful preliminary agreement because negotiating a full unitisation agreement takes a significant amount of time and needs to tackle the complexities of unitisation to the satisfaction of a number of parties. In addition, the execution of a preunitisation agreement will allow licensees to undertake initial unitisation evaluation work.

A preunitisation agreement will define how parties to licences which contain a common hydrocarbon reservoir within the licence boundary will jointly evaluate the reservoir for the purposes of submitting a common field development plan, including a plan for unitisation.

**Key provisions of a preunitisation agreement**

The preunitisation agreement will typically cover (among other matters) the following:

- initial unit interests of the parties;
- appointment of an “operator” for conducting the preunit operations such as preparation of the work programme and budgets;
- establishment of an operating committee to review and approve all preunitisation operations;
- data exchange to allow each licensee to receive a copy of all data with respect to the other licence, subject to any confidentiality restrictions which may exist with third parties;
- technical studies to determine the extent of the field dimension and quantities of oil and gas in each block;
- preparation of a development plan for submission to the government;
- provisions governing the negotiation of a unitisation agreement by a certain date; and
- appropriate termination event provisions such as (i) the decision of a licensee not to participate in the development or (ii) upon the signature of a unitisation agreement.

Data exchange between the licence groups can be problematic, as licence groups are looking to preserve the confidentiality of their own data acquired in respect of their licence. In practice, negotiation of a confidentiality agreement between the licence groups can be a lengthy process particularly where parties fail to agree the precise purpose for the use of confidential data and subsequently request to see data which is beyond the scope of the confidentiality agreement in place for protecting the confidentiality of the data already exchanged.

One of the key nuances of the preunitisation agreement which parties need to be aware of is that the interests of the parties contained in the preunitisation agreement will not necessarily be reflected in the subsequent unitisation agreement. This is because the parties will find out more about the reservoir through geological and reservoir engineering studies which will be undertaken as finalisation of the unitisation agreement occurs, and subsequently once one or more redeterminations (discussed below) are undertaken.

**The unitisation agreement**

The purpose of the unitisation agreement is to establish the unit from the two or more licence or contract areas which contain the reservoir by unitising the licensees respective interests and to provide for the development, operation and decommissioning of the unit.

The Association of International Petroleum Negotiators (AIPN) produced a model form unitisation and unit operating agreement in 2006; this model form agreement is commonly used as the starting point for documenting
unitisation within the upstream oil and gas industry.

Commercially, the philosophies behind entering into a unitisation agreement can be expressed as either being (i) a desire to jointly develop a newly-defined unit area and to jointly share in the fortunes and misfortunes of that area as if the participants were all partners in one single licence or (ii) a desire to "render unto Caesar that which is Caesar's" and try and ensure that each licence group’s share of hydrocarbons represents the hydrocarbons originally in place in its own licenced area.

**Know your language - terminology in unitisation agreements**

The diagram below sets out key terminology which is contained in a unitisation agreement.

- The “unit area” is determined on the basis of the licensees’ understanding of the surface extent of the reservoir based upon seismic studies and exploration and appraisal drilling or by depth (i.e. the three dimensional boundaries of the reservoir obtained through subsurface data because the field itself is a three-dimensional entity).
- The “tract” is the portion of the unit area underlying the licence which is owned by the licensee and the initial tract participation will be expressed as a percentage.
- The “tract participation” is the interest of a licence group within the reservoir which is allocated to a tract. The tract participation will be expressed as a percentage and will be subject to redetermination over the life of the field.

**The structure of a unitisation agreement**

The unitisation agreement is often referred to as a “super-JOA” because the form and structure of a unitisation agreement follows the form and structure of a JOA. For example, a typical unitisation agreement will contain provisions governing the following:

- the appointment and removal of the operator (referred to in unitisation agreements as the “unit operator”);
- the authority and duties of the unit operator and conduct of unit operations;
- the formation of work programmes and budgets, including invoicing and expenditure principles;
- decommissioning; and
- assignment and withdrawal.

The unitisation agreement will also contain a number of concepts which warrant further consideration. The key concepts are outlined below:

(i) **Determination of the initial tract participation/unit interest**

The tract participation/unit interests will determine each party’s expenditure commitment in respect of unit costs, entitlement to receive hydrocarbons and voting power on matters governing the unit.

A number of methods can be used to determine the tract participations of a party:

1. Stock tank oil originally in place (STOOIP) – the total quantity of petroleum in the reservoir before production commences. Whilst this is relatively easy to estimate and agree between the parties, a key disadvantage is that no distinction is made with respect to the recoverability of reserves;
2. Gross rock volume - the total volume of strata within the unit, including the porosity;
3. Reserve estimation – the amount of hydrocarbons expected to be commercially produced; or
4. Moveable oil originally in place (MOOIP) – the oil which is capable of movement within a reservoir
even if it is not actually produced.

Once the initial tract participations have been calculated, each party’s unit interest will be determined by multiplying the party’s percentage interest under its licence by the initial tract participation for that licence. This is illustrated in the example below.

It is important to note that where the unitisation agreement provides for one or more redeterminations, the final tract participations of the licence groups will be those established at the final redetermination. The tract participations initially set out in the unitisation agreement are provisional figures.

(ii) Change in the unit area

A unitisation agreement will typically include provisions governing what happens if there is a change in the unit area. For example, the unitisation agreement may state that any change to the unit area will require the unanimous approval of the parties, except in the event of the surrender, revocation, termination or expiration of the licences.

It is also common in some UKCS unitisation agreements for provisions to be included which allow a party to the unitisation agreement to request that the unit area be amended, provided that the proposed extension area:

- is exclusively owned by the parties to the unitisation agreement;
- is reasonably expected to contain Petroleum (as defined in the unitisation agreement) within the extension area which is in pressure communication and in direct and continuous hydrocarbon contact with Petroleum in the unit reservoir; and
- is not part of an existing field.

Any such request, together with supporting evidence, is required to be submitted to all parties for consideration, with the request being submitted to an expert if the parties are unable to agree unanimously that the conditions giving rise to the extension of the unit area have been met.

(iii) Redetermination

As more geological, geophysical and reservoir engineering studies are undertaken on the unitised reservoir and, accordingly, more information is obtained about its characteristics and reserve profile (including future production profile), it is common for the information derived to be used to redetermine the initial tract participation and unit interest of the parties in line with the new data obtained.

This is an important principle because it allows for a more accurate allocation of costs and production between the parties to the unitisation agreement. However, like all matters involving technical data and interpretation, which is subjective in nature, there will still be uncertainty regarding the outcome of a redetermination.

To cater for the impact of new data with respect to the reservoir, unitisation agreements will often contain provisions governing the redetermination of the tract participation and unit participation of the parties to the unitisation agreement.

The redetermination process is likely to consume a significant amount of time and money and can often lead to disputes between the parties, thus impacting on the relationships between the parties. Given that parties are ultimately deciding upon the unit interests and, consequentially, the allocation of expenditure and production to each party, redetermination of the initial tract participation can become contentious. For example in Shell UK v Enterprise Oil plc, 6 0.1% of the Nelson field to be redetermined was estimated to be worth £800,000 (albeit this was in 1999).

A unitisation agreement will contain provisions governing when a redetermination should take place, including limits on the number of redeterminations which can take place. However some unitisation agreements (particularly certain UKCS unitisation agreements), which apply to much smaller discoveries, will fix the tract participations and unit interest so that these are not subject to redetermination, given that the costs of redetermination would override any merits with respect to redetermining the tract participations.

Typical events which may give rise to a redetermination include (but are not limited to):
• completion of the last development well pursuant to the unit development plan;
• a specified anniversary after the commencement of first commercial production;
• cumulative production has reached a certain level of unit substances estimated in the unit development plan;
• sufficient “New Data” (as defined in the unitisation agreement) has been obtained; and
• a change in the unit area and/or the unit reservoir.

Interestingly in the UKCS, parties have sought to use the redetermination process to have their unit interests reduced rather than increased due to the costs incurred with exploitation of an oil field.

An example of this was the redetermination of the Balmoral Field\(^7\), where the licensees sought to have their unit interests decreased due to the high capital costs, and consequentially losses being incurred by the licensees. Although the case itself centred on the contractual interpretation of the provisions in the unitisation agreement governing the calculating of the tract participations by the expert that was appointed, the case demonstrates that licensees in the UKCS will use the redetermination provisions in a unitisation agreement to try and seek a reduction in economic losses incurred by decreasing their unit interest.

**How does the redetermination process work in practice?**

The unitisation agreement will set out the process by which the parties need to follow once it has been agreed that a redetermination should take place. A typical example involves the following process:

1. The establishment of a determination committee by the unit operator comprising of one representative of each party to the unitisation agreement for the purposes of overseeing the redetermination process;

2. The selection and appointment of an independent expert to undertake a technical interpretation of the distribution and extent of the unit reservoir, and to carry out the redetermination;

3. The establishment of a common database containing all subsurface data, whether raw, processed or interpreted as well as other data such as production data with respect to the field for submission to the expert. Some unitisation agreements will state that the common database will need to include all data which arises within a certain distance of the “Unit Area”, which is known as the “Common Data Area”;

4. The opportunity for each party to present a written report and presentation to the expert comprising of a technical interpretation of the distribution of the unit reservoir;

5. The issuance of a preliminary report by the expert on his findings and calculation of the tract participations, including supporting evidence and the quantitative method used by the expert to calculate the tract participations;

6. The determination committee will consider the preliminary report and allow for any party to request that the expert further clarify or consider further his conclusions;

7. Further commentary may be provided by the expert to clarify any issues raised by the determination committee before the issuance of the final report by the expert. In the absence of any issues being raised by the determination committee, the preliminary report will be deemed to be the final report; and

8. In the event that a redetermination is implemented, the unitisation agreement will contain provisions governing how expenditure and production is adjusted accordingly. Mechanisms vary, however it is common for the unit operator to furnish each party with a statement showing the contribution adjustment to be paid by each party which has an increased unit interest, or to be received by each party which has a decreased unit participation. The parties will have an opportunity to review and if they feel it is necessary, dispute the adjustment using expert determination.
The redetermination process - the role of the expert

For redeterminations, the “expert” will usually be an independent company with sufficient expertise and resources to undertake the redetermination rather than an individual. Often each party will provide the determination committee with a list of candidates.

The unitisation agreement should include provisions governing the appointment of an expert and may even include a proforma contract which provides the initial basis for negotiation of the contractual relationship between the parties and the expert should the redetermination be referred to an expert. In the absence of such a proforma contract, it is critical that the parties expressly establish the terms of appointment for the expert.

Given the importance of redeterminations and to ensure the integrity of the process, engagement letters with the expert may include a warranty that the expert has not conducted any study in relation to the field in question for any of the parties to the unitisation agreement prior to a specified time period, and that the expert does not have a conflict of interest with the parties.

Although as noted above, the parties to the unitisation agreement are often accorded the right to provide an initial submission to the expert comprising their technical interpretation of the distribution of the unit reservoir to assist with the expert’s redetermination. Absence of fraud or manifest error, the expert’s determination will be stated in the unitisation agreement to be final and binding.

Where the unitisation agreement fits within the upstream contractual regime

The JOAs which apply to each licence will remain in force irrespective of any unitisation agreement which is in place. The unitisation agreement will normally include a provision stating (for example):

“The provisions of any joint operating agreement in to which all or any of the Parties have entered inter se with respect to all or any part of the Licences, to the extent that are in conflict with the provisions of this Agreement are, to the extent necessary to eliminate such conflict, and except where an intention to the contrary is specifically expressed herein, superseded by the provisions of this Agreement but such joint operating agreement shall otherwise remain in full force and effect.”

This is important because a JOA will still be relevant for the conduct of joint operations in a licence or contract area which is outside the unit area. In addition, the JOA will remain the relevant agreement governing the assignment and transfer of the underlying licence interest.

Conclusion

Unitisation offers IOCs and governments a possible method of managing a reservoir straddling two or more licence or contract areas and which can provide for the geological uncertainty associated with the reservoir by allowing parties to revisit and redetermine their unit interests.

However, unitisation itself and the documentation of the unitisation in the form of the unitisation agreement require careful thought and consideration by all parties given the difficulty and potentially contentious nature of the subject matter involved.

3. Paragraph 2.5.1 of DECC’s guidance on the content of offshore oil and gas field development plans.
5. Paragraph 2.5.1 of DECC’s guidance on the content of offshore oil and gas field development plans.