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Unitisation: Is it an Approach to Reach the Most Efficient Rate in Exploitation of Common Oil and Gas Deposits?

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Abstract:

Unitisation occurs when licenses of oil and/or gas reserves pool their individual interests in return for an interest in overall unit. It is then operated by a single company on behalf of group. This happens when a field lies under different licenses with differing equity interests. This is the legal definition of unitisation, however, the very basis of the legal concept of the joint development rests on the fluid nature of petroleum or natural gas. If a deposit lies across the boundary line of two or more neighboring owners, a single owner extraction damages the potential share of the other owner or owners. It is desirable, therefore, to avoid such eventuality on the basis on some form of cooperation between them in the exploitation of the sources. Thus, the idea of unitisation arose whereby the deposit of fluid petroleum or natural gas should be treated as a single deposit if it lies across the boundary line and straddles different jurisdictions. This concept later led to on a number of international agreements on unitisation in 1960s and 1970s. Although as there are about over than twenty joint oil and gas fields between Iran and its neighboring countries, for various reasons, most of them are being exploited unilaterally, which is not compatible with the economic interests of Iran, so unitisation process and its role in agreements, particularly those of oil and gas reservoirs and summarizing the common-pool problem faced in carbohydrate productions under the rule of capture is remarkable. It defines unitisation as a solution to the problem and then describes the issues involved in arriving at an unitisation agreement.

Key-words: unitisation, common natural resources, oil and gas, rule of capture, exploitation, joint development.

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Definition:

The term "trans boundary" or "international" unitisation is used to describe an agreement between states applying unitisation procedures to a deposit located in a cross-border or overlapping claimed area. In other words, unitisation is the joint, coordinated operation of a petroleum reservoir by all the owners of rights in the separate tracts overlying the reservoir[3].

Unitisation seeks to maximize the exploitation potential of the deposit by taking its physical properties into account. It suggests that a better understanding of the underlying scientific precepts involved in exploiting a common petroleum deposit may provide more practical legal reasons for applying the unitisation principle[4].

Unitisation has been described as one of a number of legal devices seeking removes the destructive competitive element stimulated by the rule of capture, which implies that there are other devices. It simply involves supervision and coordination of petroleum exploitation for migratory deposits as a consequence of the Rule of Capture. The effect of international unitisation on a reservoir or area is to treat that area as a single entity for the purpose of secondary exploration and development.

Generally speaking, unitisation is the process whereby separate interest owners in a common reserve pool their interests to form a single unit under the sole operation of a single operator who conducts unit operations for all so that maximum efficient recovery is accomplished and production and/or revenues therefore may be shared out in accordance with the agreed basis established in the unit plan.

Unitisation Agreement:

Unitisation agreements have been defined by Taverne as agreements between two or more persons or groups having exploitation rights in common petroleum reservoirs by which these reservoirs will be exploited in an integrated manner, as a single unit.[5]

The unitisation agreement include, among others: identifying the area and limits to be unitized, private parties holding an interest, the designated unit operator, a development plan (including wells), how to secure the government’s interest (taxes or any other related legal obligation), safety and environmental measures to be taken, and determination and redetermination procedures. These provisions are particularly worthy of mention because they serve as a link between governments and licensees and specify how the licensees can proceed in order to exploit jointly a shared reservoir.

The unit operating agreement is the legal form used to document the agreement between the licensees by means of granting the operator the power to perform all of the operational tasks. It also identifies and allocates responsibilities, which includes liabilities and rights. Under normal circumstances, rights and responsibilities are equal to the respective interests of the parties in the reservoir. The Agreement requires the execution of the unit operating agreement before the unitisation agreement is approved.

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[3]- Kashani Javad (PHD), The Shared Resources of Oil and Gas in International Law, The Shahr-e-Danesh Institute of Law (Research and Study), Iran/Tehran2010, p38.
[4]- See UNCLOS, (defining the outer limits of continental shelf extension).
[5]- Albert E. Utton and Paul D. McHugh, On an Institutional Arrangement for Developing Oil and Gas in the Gulf of Mexico, RESOURCES J.(1986).

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What the governments involved do is to provide the various interest holders with common and shared policies and supervision, requiring them to appoint one unit operator which acts on behalf of the licensees and undertakes the activities of exploration and exploitation of a common reservoir under conditions already known as unitisation agreement and a unit operating agreement. A good example is operation in the Gulf of Mexico.

Unitisation agreement is to be negotiated between operators and subsequently proposed to each of the governments. The governments may then approve, modify, or reject the proposal.

Great care and attention must be taken to determine the amount of hydrocarbons allocated to each licensee. This is because according to the hydrocarbons allocated to each licensee, the companies in the unitisation agreement and in the unit operating agreement provide for investment.

After an unitisation agreement is effective, in order to proceed with the exploitation of a shared reservoir, the agreement must be more detailed. In order to conduct petroleum operations for specific sections, the unit operating agreement provides for a single operator to conduct operations and make decisions.

As unitisation agreements usually involve large prospects, big sums of money, and as unitisation is at an early stage of a field's development, it is useful to consider three stages to unitisation, as follows:

a) The pre-unitisation agreement (entered into at the time of discovery (or appraisal) of a common reservoir, generally before commerciality is declared);

Due to the complexity of unitisation and the time consumed negotiating a full unitisation agreement, participants involved may enter into a pre-unitisation agreement to allow preliminary work to be conducted while negotiations are proceeding. This preliminary work often consists of joint technical studies to determine the extent of the field or reservoir to be unitized and the quantities of oil and gas in that field or reservoir that underlie each block. Pre-unitisation agreements sometimes appoint an initial unit operator to conduct this work and, regardless of whether an initial unit operator is appointed, will generally authorize the party conducting the work to charge the applicable costs to all parties based on an interim allocation.

There is no standard form for of pre-unitisation agreements as the size and scope of such agreements varies enormously; two examples illustrate this difference. The first example, for an unitisation in Indonesia, in fourteen pages covered the following main subjects:

- Reimbursement of certain data acquisition costs;
- Drilling of a jointly-funded well to determine the field extent near the block boundary and payment of the costs of that well;
- Exchange of data;
- Principle on which unit interests will be calculated;
- Premium for one block to participate in the unit;
- Principles for the unitisation agreement;
- Principles governing certain downstream activities;

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- Further drilling to be conducted on one of the blocks by the block operator; and
- Confidentiality and dispute resolution.

The unitisation agreement (usually coincident with an agreed development plan);

b) Once a unit is formed, each separately owned tract that participates in the unit will be entitled to an undivided percentage of unitized production obtained in any unit operation, regardless of the tract from which it is produced, and will be liable for that same undivided percentage of costs and liabilities incurred in any unit operation, regardless of the tract to which they relate. That undivided percentage is described as the "tract interest." The unit parties will endeavor to have the allocation of production and costs by tract interest.

c) Redetermination of participation factors (as specified in the unitisation agreement) as more data becomes available from field development and production.

An unitisation agreement can be difficult to negotiate and implement because of the complex issues involved, the layering of several sets of agreements of overlapping subject matter, the prospect of revisions to the economic and voting interests of the parties during the life of the agreement, and the general absence of regulatory guidelines. Notwithstanding such difficulties, unitisation is best served by a carefully written agreement that addresses the relevant issues clearly, because the costs of resolving disputes over a flawed agreement far exceed the costs of achieving a carefully written agreement.

The Role of Joint Commission:

The joint commission is responsible to make or accept the determination or redetermination of the productivity of a trans-boundary reservoir and also to either approve modifications or reject the unitisation agreement and the unit operating agreement when the executive agencies of each government fail to agree.

In case the joint commission disagrees on the solution of determination/redetermination, an expert will intervene for determination. In other situations, if the joint commission fails to resolve the questions related to the unitisation or operating agreements, each government may get help through consultations, mediation or arbitration alternatively.

Joint development agreement

Joint development and trans-boundary unitisation are designed to preserve the unity of such a deposit in these circumstances, while respecting the inherent, sovereign rights of the interested states.

Trans-boundary unitisation and joint development are among several possible legal outcomes. However, this requirement alone cannot be used to bring pressure to bear on a state, in the form of international legal sanctions, if it decides to remain aloof from the idea of joint development as its preferred outcome.

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Choosing a joint development agreement covers substantially all of the area offering any significant prospect of hydrocarbon production. It also recommends the unitisation of deposits found lying across the line.

It has to be noted that in some joint development zones the two countries may establish a joint management body with a single set of petroleum regulations and fiscal terms, and the unitisation of a reservoir that crosses a license boundary, but lies wholly within the zone, would then be analogous to a sole-country unitisation.

Noting that unitisation is the most common cooperative form of petroleum exploitation, the geographical scope of the alleged substantive rule concerning joint development has also been questioned.. "What might be reasonable and obligatory in one part of the world might not necessarily be considered so in other parts with different conceptions of law."[6] Yet the sheer number and geographical variety of joint development and trans boundary unitisation agreements concluded to date appear to negate this assertion.

The Joint Development Zone (JDZ) is generally established as a temporary solution for a specified period of time, without prejudice to subsequent delimitation, but it can be a permanent solution in place of a delimited boundary[7]. Even where the border has been delimited, a JDZ may be created as part of the boundary settlement, but this is a less common alternative because states where boundaries are delimited tend more towards the unitisation of specific fields[8].

Although a joint development zone will solve certain problems associated with boundaries, it will not remove the need to deal with the situation where a petroleum deposit crosses a boundary. In fact, since the perimeter of a JDZ is inevitably longer than the section of boundary that would otherwise be present, the likelihood of unitisation being required is in a sense even greater than in the case of conventional boundary.

A JDZ covers a large geographical area which can contain several fields and contract areas. If separate contract areas held by different contractors are found to extend over a petroleum deposit within the JDZ, a unitisation agreement will naturally be entered into among the different license holders in that particular field. Additionally, a field may cut across the boundary of the JDZ and intrude into the exclusive territorial area of a State as is the case with the Greater Sunrise Field Unitisation Agreement; where the field will be subject to a cross border unitisation agreement between the JDZ and the State.

The Concept of Cross-Border Unitisation

It is important to draw a distinction between "cross-border unitisation" and "joint petroleum development." Both cross-border unitisation and joint petroleum development are cooperative practices designed to preserve the unity of the deposit while respecting the inherent, sovereign rights of the interested states. By contrast, joint petroleum development

[6]- See, e.g., Agreement Relating to the Unitisation of the Sunrise and Troubadour Fields, Austl.-Dem. Rep. Timor-Leste, Mar.2003,

[7]- IAN TOWNSEND-GAULT & WILLIAM STORMONT, Offshore Petroleum Joint Development Arrangements: Functional Instruments? Compromise? Obligation?, in THE PEACEFUL MANAGEMENT OF TRANS-BOUNDARY RESOURCES (Gerald Blake et al. eds., 1995).

[8]- See ZDENEK SLOUKA, INTERNATIONAL CUSTOM AND THE CONTINENTAL SHELF 89 (1968).

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agreements refer to arrangements between two states to develop and share in agreed proportions the petroleum found within a geographic area whose sovereignty is disputed[9].

However, cross-border unitisation in the strict sense covers situations where a common reservoir is underlying the delimited boundary between two states, and it involves the treatment of an identified deposit -that is, a specific petroleum reservoir or field- as a single deposit[10].

If countries share a common hydrocarbon reservoir across an established border, and are unable to agree on a definitive unitisation agreement after making reasonable efforts to cooperate, international law does not require them to unitize the reservoir. Most countries, however, prefer a cooperative approach rather than unilateral approach for economic and political reasons, not necessarily legal reasons. Unitisation takes place for a reservoir underlying two or more countries that have a delimited border between them. Such unitisation will typically involve two or more different licensees.

Any cross-border unitisation will need to be agreed to at two levels:

(1) The impacted states will need to reach an agreement and

(2) The respective license holders will need to enter into a unit operating agreement.

The purpose of the first agreement is to set out the rights and obligations of the states. The North Sea continental shelf has several examples of cross-border unitisation agreements. The first example is the 1976 unitisation treaty between the United Kingdom and Norway for the Frigg gas field[11].

Subsequent agreements for the Murchison and Statfjord fields[12], signed in 1979, were largely based on the Frigg Agreement[13].Until relatively recently; the only other example of a cross-border unitisation in the North Sea was the Markham field agreement of 1992, between the United Kingdom and the Netherlands[14]. There are also instances of cross-border unitisations in other parts of the world.

It is noteworthy that unitisation treaties between states generally follow the same practice used in domestic unitisation agreements and provide for two distinct binding dispute resolution mechanisms.

Some examples of bilateral unitisation agreements can now be found in different parts of the globe, both across delimited borders and across the boundary of JDZs[15]. Common practice

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[9]- William T. Onorato, Apportionment of an International Common Petroleum Deposit, 26 INT'L & COMP. L.Q. (1977) pp. 332-333

[10]- See id. (Explaining that unitisation is a simple process used to promote a "maximum efficient recovery" in both production and revenue according to a plan between "separate interest owners").

[11]- Agreement Relating to the Exploitation of the Frigg Field Reservoir and the Transmission of Gas There from to the United Kingdom, May 1976.

[12]- Agreement Relating to the Exploration of the Murchison Field Reservoir and the Off take of the Petroleum There from, Oct. 1979.

[13]- G. Campbell, Unitisation: A UK State Perspective on UK and Median-line Fields, 1 OGLTR 5 (1983).

[14]- Jim Ross, Unitisation Lesson from the North Sea, SPETT NEWS (Soc'y for Petroleum Eng'rs, Trin. & Tobago), Sept. 2003.

[15]- Examples of Cross-border Unitisation of Offshore Petroleum Fields have been identified.

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has been to subject most disputes to arbitration, except for disputes over technical issues, such as the redetermination of the apportionment ratio, which are subject to expert determination[16].

It has to be noted that the rule of customary international law requiring unitisation is not yet established. Unitisation is a specialized form of cooperative development where a strong degree of political consensus is a prerequisite for its implementation[17]. There needs to be a procedural requirement to cooperate under international customary law, cross-border unitisation and joint. International law cannot force a state to accept the idea of unitisation with regard to exploitation of common petroleum deposits if the state is not willing to do so.

The Concept of Joint Petroleum Development Agreements

The joint petroleum development agreement refers to an arrangement between two states to develop and share jointly in agreed proportions the petroleum found within a designated zone of seabed and subsoil of the continental shelf or EEZ, to which both states are entitled under international law[18]. By contrast, a cross-border unitisation arises in a situation dealing with the treatment of an identified deposit, that is a specific petroleum reservoir or field that lies across a delimited boundary line[19] . Nevertheless, before such a zone is created, the states must be able to:

(i) Accept pooling together of sovereign rights over the area or zone;

(ii) Have a consensus ad idem on all the major policy matters ab initio; and

(iii) Never lose sight of the paramount objective-exploring for and producing oil and gas[20].

Unitisation Treaties

Agreements in the North Sea

There are four examples of field-specific agreements between states regarding the exploitation of straddling petroleum reservoirs by way of unitisation in the North Sea[21] . It

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[16]- See, e.g., Agreement relating to the Unitisation of the Sunrise and Troubadour Fields, Austl.-Dem. Rep. Timor-Leste, Mar. 2003.

[17]- Ian Townsend Gault, Petroleum Development Offshore: Legal and Contractual Issues, in PETROLEUM INVESTMENT POLICIES IN DEVELOPING COUNTRIES Nicky Beredjick & Thomas Walde eds., 1988).

[18]- See HAZEL FOX ET AL., JOINT DEVELOPMENT OF OFFSHORE OIL AND GAS--A MODEL AGREEMENT FOR STATES FOR JOINT DEVELOPMENT WITH EXPLANATORY COMMENTARY (1989) (discussing a model agreement utilized when parties claim conflicting sovereign rights because of disagreement over rights to oil and gas resources in a designated zone).

[19]- See William T. Onorato, Apportionment of an International Common Petroleum Deposit, 26 INT'L & COMP. L.Q. (1977). Pp.333-36

[20]- see note 5 , pp. 70-71

[21]- In addition, in a recent Exchange of Notes between the United Kingdom and Norway, an agreement has been reached to not unitize two fields with minor extensions across the border (one with a small extension into Norway and the other with a small extension into the United Kingdom) in a quid pro quo arrangement. Secretary of State for Foreign & Commonwealth Affairs, Exchange of Notes between the Government of the United Kingdom of Great Britain and Northern Ireland and the Government of the Kingdom of Norway Concerning the Play fair and Boa Petroleum Fields, Oct. 2004 .

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should be noted that these unitisation agreements got their legal force from the bilateral delimitation agreements signed between

The United Kingdom and Norway on March 10, 1965. The agreement contained a commitment to cooperate in the development of petroleum deposits that straddle the boundary between the two states. In the case of the U.K.-Norway unitisation treaties, there were also deeds signed between the licensees and their respective governments binding the licensees to uphold the obligations placed on them by the treaty because they were not parties to the treaty itself[22] ; and between the United Kingdom and the Netherlands on October 6, 1965.

The most important example, in terms of oil volume and associated gas, is the Statfjord Agreement. The Statfjord Agreement, and the Murchison agreement of the same year, largely followed the pattern of the earlier Frigg Agreement[23] . The other example of unitisation across an international boundary in the North Sea was the Markham agreement.

If any single petroleum reservoir extends across the dividing line and the part of such reservoir, which is situated on one side of the dividing line, is exploitable, wholly or in part, from the other side of the dividing line, the two states are obliged, in consultations with the licensees, if any, to seek to reach agreement as to the manner in which the petroleum reservoir shall be most effectively exploited and the manner in which the proceeds deriving there from shall be apportioned[24]. There is no specific obligation to cooperate through unitisation; however, this is the approach that has been adopted as the best possible option for the exploitation of the cross-border petroleum deposits in all of the agreements between states concerning the North Sea[25].

Iran and Unitisation Agreement

In some jurisdictions unitisation is either voluntary or compulsory while in others it is just subject to the freedom of contract. Whichever way, unitisation is gradually moving from choice to obligation.

These situations gradually permit the notion that unitisation is somewhat of an obligation and not merely a contract that ensues from volition.

There is support among leading international scholars and practitioners for the proposition that a country may, if it is unable to reach a unitisation agreement with a neighboring country, unilaterally exploit a cross-border reservoir, though it should be noted there is no international convention or court decisions directly upholding such proposition[26].

[22]- G. Campbell, Unitisation: A UK State Perspective on UK and Median-line Fields, 1 OGLTR 5 (1983)
[23]- Peter D. Cameron, The Rules of Engagement: Developing Cross-Border Petroleum Deposits in the North Sea & the Caribbean, INT'L & COMP. L.Q. (2006), p. 572.
[24]- U.K-Norway Delimitation Agreement, art.4.
[25]- There is now a specific obligation to unitize cross-border fields between the U.K. and Norway pursuant to a 2005 Framework Agreement. Two other fields (Blane and Enoch) have subsequently been unitized. See Framework Agreement Between the Government of the United Kingdom of Great Britain and Northern Ireland and the Government of Norway Concerning Cross-Boundary Petroleum Cooperation, and Press Release , Government News Network, First Strike for UK Norway Deal (July 2005)
[26]- UNITISATION OF CONTRACT AREAS: IS IT AN OBLIGATION DEFEATING THE STABILITY OF INTERNATIONAL PETROLEUM AGREEMENTS?
Anozie Ikechukwu Awambu, University of Dundee, 2008

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In one case study that supports the application of the rule of capture in a cross-border reservoir context, a scholar and practitioner, Rodman Bundy, described a situation in which an oil company was producing oil from an Abu Dhabi offshore field called the Sassan field that straddled a delimited international boundary between Iran and Abu Dhabi. William Onorato, former Vice-President (Legal) for Standard Oil Company of California, supports the view that on considerations of pure sovereignty, it is indeed possible for a country to abandon title to property through failure to maintain a minimum of sovereign rights in the face of rival activity. Thus, if a country were notified that its neighbor intended to produce from a common reservoir, but for some reason took no action, the country taking no action would risk losing a claim to any property in the common reservoir[27].

In the Abu Dhabi-Iran example, Abu Dhabi actually increased its production from the field when Iran's production was shut down. Indeed, even when Abu Dhabi curtailed its overall production in compliance with Organization of Petroleum Exporting Countries (OPEC) quotas, it made a deliberate decision to exclude the field from any prorated decrease.

Clearly, this exacerbated the migration problem from Iran's point of view. Yet Abu Dhabi apparently took the position, with which Bundy agreed, that Iran had no cause of action against Abu Dhabi under international law. It should be noted that the delimitation agreement between the countries provided neither country would drill within 125 meters of the boundary without the other country's approval. The delimitation agreement also contained an obligation to "endeavor to reach agreement as to the manner which the operations on both sides of the boundary could be coordinated or unitized". Article 2 of the Iran- UAE Agreement of 13 August 1974.

Qatar's North Field straddles that country's median line with Iran, where it is known as South Pars. Qatar is said to be aggressively developing the North Field without having a unitisation or other joint development arrangement in place with Iran. Qatar's production in the North Field is reducing Iran's ultimate liquids recovery28. It is uncertain whether Iran may ultimately decide to voice an objection under international law to such activities.

Further, although not directly on point, ICJ decisions have upheld the rights of a country to explore for hydrocarbons in disputed territorial waters. These decisions suggest that a country with a delimited boundary would have inherent sovereign rights to produce hydrocarbons from a reservoir extending across a delimited boundary after exercising its duty to cooperate —but is unable to reach a unitisation agreement.

Interlicensee Unitisation Agreements

In addition to the unitisation treaty between two states, there will also be an agreement between the licensees on each side of the border[29]. These agreements are not in the public domain but are similar to a typical unitisation and unit operating agreement found in domestic

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[27]- William Onorato, Apportionment of an International Common Petroleum Deposit, 26 INT'L & COMP. L.Q. 324, 329 (1977)

[28]- Cross-Border Petroleum Reservoir Development Tactics, Law360, Center for Security Studies, New York, May 23, 2012

[29]- Agreement Relating to the Exploitation of the Frigg Field Reservoir and the Transmission of Gas There from to the United Kingdom, May 1976, 1098 U.N.T.S. 4. , Art.1 (2).

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unitisations, except that they must be consistent with the terms of the treaty. Hence, they will be subject to the approval of both states[30].

The primary differences will be the requirement for certain key issues like selection of operators, approval of the development plan, initial apportionment ratio and any redeterminations thereof, and changes to the unit area to be subject to the approval of both states and the licensees.

Alternatives to Unitisation

An alternative to the unitisation is the joint-venture, as was the case between France and Spain. Each country retains its sovereignty and jurisdiction of a common area where the companies can operate together to obtain the products belonging to one country or the other.

Other variations on full unitisation exist such as fixed interest agreements and cross-license agreements.

Fixed interest is an attempt to avoid the difficulties of redeterminations in tract participation and fix the percentage interests of the parties at the commencement of development, but it is essential for the parties to agree on the technical details without drilling a development well. This is of course a high risk option which may have negative financial implications on the parties, which is why it is preferred in the case of small developments.

Cross licensing on the other hand involves the license holder taking a cross assignment of each other's interests and becoming parties to the entire unitised area. This option also requires that the parties agree on the sharing ratio of reserves and it is of course rare.

The above options to unitisation have clearly shown that they are only useful in cases of small developments. Oil and gas developments are by nature highly capital intensive with huge upfront costs which is a major incentive for oil and gas companies coming together under a co-operative arrangement to mitigate their risk and minimize their costs.

Situations arise however where parties choose to not to unitise or regulate. This is a fall out of the difficulties involved in negotiating Unitisation, complicated and expensive redetermination of tract participation, a key component of Unitisation.

How useful these approaches will be and whether the benefits will outweigh unitisation can be ascertained upon a close scrutiny of the different alternatives.

No Unitisation

Unitisation will be unnecessary where:

- A field extends beyond its block into an unlicensed territory, the natural thing to do is to make an out of rounds application and if granted, both fields can be developed by the same owners.
- A small part of a field crosses into a licensed field and unitisation is not necessarily the option. This happens because of the huge Capital involved in oil exploration and exploitation, which necessitates interest holders to enter into co-operation Agreements

[30]- Id. Art.5

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like the Joint Operating Agreement (JOA) to mitigate their risk and minimize their financial contributions.
- One group purchases the adjourning field extending into its block from another group and develops it on its own without the necessity of Unitisation.

This arrangement looks simple, but it can only be attractive to either group if the extension into the adjoining block is a small one. If the extension is sizeable, commercial considerations are likely to favour unitisation in view of the huge economics of exploration and exploitation.

Rule of Capture

The Rule of Capture is said to be the cornerstone of the oil and gas law and has "been an integral part of oil and gas law since the completion of the first commercial oil well in Pennsylvania in the 1840s"[31]. As evinced in the above quotation, the rule allows an owner of an adjoining land to exploit underground minerals which straddles boundaries of a neighbouring land subject matter of a different ownership. The rule, whose evolution was principally an 'ownership' concept, albeit oil and gas issues have gone beyond ownership, still poses great challenges to oil and gas development- both nationally and internationally. Given the absence of international law requiring unitisation or joint development if countries, after cooperation, do not reach an agreement with respect to a cross-border reservoir, there is a logical question of what rights a country has to exploit the portion of the reservoir located in its delimited territory. Some commentators emphasize the sovereign rights of a country to explore for and exploit natural resources in its sovereign territory, and have suggested that the "rule of capture" applies to such situations[32]. We view this line of reasoning as supportable based on the scholarship and publicly available practice examples, though it should be pointed out that there is no international convention or International Court of Justice decision directly addressing the rule of capture.

Although there is support for the application of the rule of capture in the international context, most countries instead prefer a cooperative approach, primarily for practical economic reasons. A country may be interested in a cooperative approach because:

- It prevents its neighboring countries from unilaterally extracting petroleum from the common petroleum reservoir.
- It lowers their extraction costs and achieving maximum production rates; and

Countries may also be incentivized to cooperate in situations where it is the only viable way to protect their sovereign rights to the petroleum in place, without prejudicing their rights against one another.

[31]- Kramer, B.M, et al, The Rule Of Capture – An Oil And Gas Perspective

[32]- affirming the applicability of an inferred rule of capture under international law but noting that within the North Sea context, UK and Norwegian domestic regulations had replaced this rule with that requiring the unit(isation) or cooperative development of adjoining license tracts. See also Rodman R. Bundy, Natural Resource Development (Oil and Gas) and Boundary Disputes, in PEACEFUL MANAGEMENT OF TRANSBOUNDARY RESOURCES at pp.23- 24 (Gerald H. Blake et al. eds., 1995); cf. A group of lawyers specializing in the international law of the sea and energy at the Third Workshop on Joint Exploration and Development of Offshore Hydrocarbon Resources in Southeast Asia, held in Bangkok from February 25 to March 1, 1985, broadly agreed that no international rule of capture exists, citing a handwritten memorandum entitled "Summary Thoughts" by Jon Van Dyke, chairman of the final session.

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Calculation the Shares

The procedure to calculate the shares between the states are usually dealt with through a procedure known as "unitisation" which requires a deep knowledge of the reservoirs. Previous to that,

- The two Governments must agree that the petroleum filed is a trans-boundary reservoir which should be exploited.
- The reservoir shall be exploited as a single unit.
- The two Governments shall individually grant the authorizations required by their respective national law.
- In the event that a trans-boundary reservoir is to be exploited as a single unit by making use of a host facility, the two Governments shall agree the most appropriate procedures to exploit that trans-boundary reservoir.

Any of this type of agreements can include simple or complex clauses depending on the detail of activities that are allowed.

In the Norway-UK agreement on the Frigg field, each government requires the acknowledgment of the counterpart to establish a contract with the licensees of the neighbor country to appoint a common operator.

Unitizing Oil and Gas Fields around the World:

A Comparative Analysis of National Laws and Private Contracts;

Unitisation of oil and gas fields is commonplace in the United States where private ownership of minerals has often resulted in fractionalized ownership of the oil and gas in a common reservoir Sole-Country Unitisation: which takes place wholly within one country; the reservoir does not extend beneath state borders, but it does extend underneath the boundaries of different license areas, usually with different licensees. This unitisation will be governed by the laws and regulations or contract provisions (if any) of the country where the reservoir is located.

When two or more groups unitize, they often sign a unitisation agreement, which is essentially a "super Joint Operating Agreement" combining all of the acreage in the reservoir and defining how cooperative development will proceed among the licensees. The host country generally must approve the terms of the unitisation agreement. Unitisation has the following effects under the typical licensing, concession, or production sharing agreement:

- Unitized shares of production and costs are allocated to each block.
- Generally, cost recovery, profit oil, and royalties continue to be calculated on a block basis, using the shares of production and costs allocated to each block. In some instances where one of the blocks is not yet licensed or is held entirely by the national oil company, unitisation will be accomplished by giving the licensees from the other block rights over both blocks, perhaps at cost recovery and profit oil splits and royalty rates that vary from the splits and rates agreed under the agreement for the licensees' original block.

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- Taxes, if ring-fenced by block, continue to be ring-fenced but will use the shares of production and costs allocated to each block for purposes of determining income and expenditures.
- Domestic supply obligations continue to be calculated on a block basis.
- Any remaining minimum work obligations continue to apply on a block basis.

Conclusion

In this paper unitisation is briefly presented as a solution to approach the maximum efficient rate in exploitation of common carbohydrate deposits and as the results shows, it is all because of its benefits.

There are many advantages to unitisation. First, unitisation facilitates the exploration of a large area where common geological and reservoir characteristics exist.

Unitisation increases the economic practicability of exploration and production through

The sharing of risks and costs with partners;

Providing more options for strategic well locations thus maximizing efficient reservoir recovery and minimizing waste; and

Consolidation of facilities, pipelines and access roads.

Strategic well and facilities placement also minimizes surface disturbance causing less environmental degradation. Yet another benefit of unitisation is the ability to operate a unitized area as a Single lease.

Unitisation is an effective way to operate efficiently and minimize waste and disturbance. As with any form agreement, the Unit Agreement and Unit Operating Agreement should be thoroughly reviewed as they contain the parties' rights, duties and obligations. The parties may also desire to modify or include additional provisions and undoubtedly these agreements will continue to evolve.

The fundamental principle of unitisation has been widely adopted in the world. Outside the United States, unitisation is commonly undertaken at the time of initial field development, and may be supplemented by a redetermination of the relative interests of the parties later in the field's life.

A rule of international customary law requiring unitisation is not yet established because states are only obligated to negotiate, but not to reach a successful conclusion. Where states decide to cooperate, cross-border unitisation and joint development agreements are among several possible legal outcomes.

In conclusion, the evolving trend in international practice is moving toward unitisation in situations where common petroleum reservoirs straddle the boundary between ownership interests of two or more parties. This trend is true regardless of whether these parties are foreign oil companies or government oil companies in one state or if the parties are two or more separate sovereign states. The practicalities, motivations, operational efficiencies, and near-term viability of unitisation or joint development will continue to drive oil companies and sovereign nations alike to the same ultimate conclusion: unitisation of a common reservoir makes the most sense.

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