



# Field Unitisation and Redetermination

**Gaffney,  
Cline &  
Associates**

## Who is Gaffney, Cline & Associates?

Gaffney, Cline & Associates (GCA) is a global consultancy that has been offering technical, commercial, and strategic advice to the oil and gas sector for over 50 years. GCA's reputation demonstrates that advice, along with its insight, is high-quality, impartial, technically based, and commercially astute. GCA is often referred to as one of the leading Reserves consultants within the industry, but in reality, GCA offers a full range of upstream, midstream and downstream technical and commercial consultancy services. These range from seismic interpretation, static and dynamic reservoir modelling, field development planning, field engineering, gas monetisation, LNG/GTL, mergers and acquisition, economics and project finance. GCA operates worldwide from three main offices in London, Houston and Singapore, and from regional offices located in Dubai, Argentina and Australia.

## Unitisation and Redetermination

Unitisation and Redetermination (U&R) can be a time consuming and costly activity for any company involved in the process. U&R requires specialist skills and experience that may not be readily available within the company. These issues can be managed by appropriate planning and training, and the use of teams skilled and experienced in Technical and Commercial U&R matters.

GCA has a wide experience in U&R projects gained over many years and in many geographical locations, and can work with your company to ensure that the U&R process achieves the best outcomes. GCA has worked with clients to advise on the process, undertake work as part of a client team (or act as the clients' team) as well as being the Expert in matters of dispute. This experience allows GCA to provide an unrivalled understanding of the U&R process which it uses to help deliver bespoke solutions to address the clients' needs. This can range from providing techno-commercial advice on the basis for tract participation (Table 1), to providing a full technical team to undertake the project on behalf of the company.

Straddle Situation	PRINCIPAL OPTIONS									
	No Unit		Unit		Unit + Redetermination(s)					
	Sole Development	Partitioned Development	Fixed Equity	Buy-Out	Asset Swap	Flexible Technical Procedures	Unitise Fluid-types Separately	Hybrid	Retroactive Unitisation	Unitisation with Pre-activity
<b>Economically Marginal</b>			X		X					
<b>Market Volatility</b>					X		X			
<b>Complex Lithology</b>			X			X		X		
<b>Hidden Pay</b>						X		X		
<b>Multiphase Fluids</b>			X				X			
<b>Cross-License Trends</b>						X		X		
<b>Small Tract Participations</b>	X			X						
<b>Predominant Unit Owner</b>			X	X						
<b>Brown-Green</b>	X			X			X		X	X
<b>Brown-Brown</b>		X					X		X	X

Modified after Worthington (2011)

## GCA U&R Experience

GCA has, for more than thirty years, been actively involved in work relating to U&R. This includes the role of the Independent Expert in matters of dispute, advisor to individual companies (or groups) and as a substitute technical and commercial team for companies or groups.

Equity determinations have long history, and were relatively frequent in Europe, and especially the North Sea. GCA has built on this experience to develop a U&R practice that now encompasses many regions; from the Americas, through Africa and Asia to Europe. This has allowed GCA to develop a techno/commercial understanding of all aspects of the U&R process and allows GCA to provide a unique offering to clients.

## GCA U&R Experience Examples

**Unitisation Study:** GCA was jointly engaged by the owners of two large gas-condensate fields in South East Asia to independently assess the tract participation, volumetrics and recovery factors. The fields consisted of three main production layers which group a large number of reservoirs that are independent pressure units. GCA provided an integrated team to conduct an assessment of the gross rock volumes, net volumes, net pore volumes, hydrocarbon pore volumes, gas initially in place, condensate initially in place and gas recovery factor. GCA acted as the independent expert and arbiter under a strict process and schedule.

**"Reserves" Redetermination, UK North Sea:** GCA carried out a detailed study to resolve "Matters in Dispute" for the redetermination of reserves in an oil field situated in the U.K. North Sea. In this regard, GCA acted as an independent expert appointed jointly by all parties after they had failed to agree on a reallocation of equity in the field.

**Training Course Provision, Europe:** For a European national oil company GCA prepared and presented a training course to provide knowledge and understanding for staff with limited experience of U&R. GCA also recommended manpower allocation and negotiating strategies to achieve corporate objectives.

**Techno-commercial Advisor, Norway:** For a Norwegian company involved in a significant oil field redetermination, GCA provided techno-commercial advice to optimise the company's negotiating position. GCA acted as technical team leader and undertook a state-of-the-art evaluation of the key petrophysical parameters utilised in calculating oil-in-place, the technical basis for the derivation of tract participation.

**Procedure Review, Australia:** For an operator involved in complex unitisation and redetermination negotiations relating to a large number of onshore oil and gas fields in Australia, GCA reviewed the draft unit procedures and suggested amendments in order to reduce ambiguity and highlight potentially problematic areas.

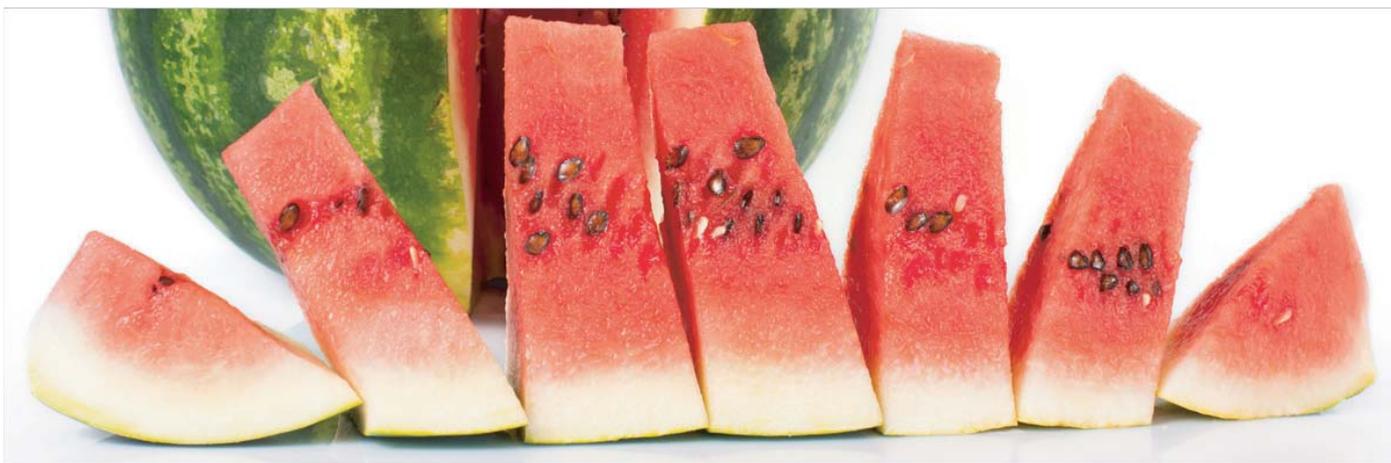
**Training Course Provision, Australia:** For a consortium of Australian companies planning to engage in unitisation negotiations, GCA prepared and presented a training course, and recommended manpower allocation and negotiating strategies designed to achieve corporate objectives.

**Commercial Advisor, Denmark:** For a Danish company involved in unitising a small offshore oil field across an international boundary, GCA provided commercial advice on the structure, basis and format of the unitisation agreement and the associated transportation and processing agreements. GCA also provided advice during the unitisation negotiation process.

**Unitisation Agreement, Nigeria:** For a European company in a redetermination of an offshore oil field in Nigeria, GCA drafted a modified unitisation agreement and developed a commercial case for the modification which was utilised by the client in negotiations with the other parties. The amended agreement superseded the earlier 'Heads of Agreement' then in place. Supporting evidence (drawn from the public domain and from GCA's previous experience) substantiating the techno-commercial basis for the amended agreement was also provided.

**Technical and Strategic Advisor:** For a large European company involved in a major redetermination, GCA provided technical and strategic advice covering the optimisation of the documentation to be submitted to the independent expert. GCA also provided strategic advice on the expert selection process and the expert's contract.

**Field Model Update and Evaluation, Norway:** For a major non-operating partner involved in an equity redetermination in Norway, GCA provided an integrated team of technical and commercial/strategy expertise to update and evaluate the client's field model and to evaluate sensitivities to the equity tract participation. GCA reviewed the operator's equity proposals and prepared a detailed rebuttal to generate the client's 'matters of disagreement'. Based on this work, GCA prepared the company's submission to the selected expert.



**Training Course Provision:** For an eight-company group involved in unitising an offshore gas condensate field in a Joint Development Area in the Timor Sea, GCA was commissioned to present a four-day training/orientation course in the principles of unitisation and redetermination.

**Strategic Advisor:** For a large European company involved in the negotiation of a unitisation agreement for a major gas field in the Far East, GCA provided strategic advice on the implications of the proposed agreement terms.

**Technical and Strategic Advisor:** GCA worked for a major European company to support their on-going U&R projects. This provided training and advice to their in-house team, including specialist technical and strategic input in support of the teams submissions.

**Redetermination Advisor, Norway:** For an international Major with a non Operating interest in a multi license development involving three large fields in Norway, GCA provided advice during the first equity redetermination. The fields include multiple pools with reservoir fluids varying from volatile oil to dry gas. GCA also assisted the client to develop a 'list of disagreements' on the Operator's proposals, and represented the client at negotiations with the Operator.

**Technical Evaluation:** GCA working for a major oil company undertook a full technical evaluation of a giant offshore gas field using the prescribed Technical Procedures in support of the unitization process. This involved the definition of the straddle and the evaluation of non-straddling reservoirs.

**Expert Witness, Australia:** For an Australian operator, GCA acted as an Expert Witness during a redetermination dispute involving onshore gas fields.

**Field Unitisation Strategy Advisor:** For a European independent GCA was retained to provide advice on a field unitisation strategy and subsequently to host a seminar to review this strategy with partners.

## GCA Offering

GCA uses its techno-commercial experience in U&R to provide to the client a range of solutions to any U&R issue. This can range from a seminar providing introductory information focusing on the technical or commercial issues as required, to providing full technical and commercial support to the client throughout the U&R project. In addition GCA has worked as the "Expert" in Matters of Disagreement.

GCA also offers a 2 to 3 day duration U&R training course that provides in-depth understanding of the processes and procedures commonly used in U&R. This provides the clients team with a clear understanding of what can happen during a U&R project and can help in the development of a "road map" to navigate this complex issue thereby assisting in maximizing the value of the process.

GCA will be pleased to discuss how it can help any client and to develop bespoke advice or training to meet the clients ongoing U&R needs and requirements.

## Additional Information

For more information about GCA's integrated services, please contact your local GCA office.

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