MARITIME BOUNDARY DELIMITATION

Lines in the Sea

Under the 1982 United Nations Convention on the Law of the Sea (UNCLOS) coastal states may claim rights over the resources of the sea and seabed up to 200 nautical miles (M) from their coasts, and seabed jurisdiction out to 350M where the continental margin is wider than 200M. But many boundaries are ill defined and even disputed. With the oil and gas industry operating in ever-deeper waters, the need for geodetically precise maritime boundaries has become increasingly pressing. This article explores the challenges involved.

More than 30% of the worldâ€™s oceans now fall under state jurisdiction, with overlapping maritime zones creating the need for some 430 international maritime boundaries, fewer than half even partially agreed. Many are also technically poorly defined, leading to uncertainty and politically and commercially costly disputes. All that is required to define a maritime boundary with precision is a list of turning-point coordinates referred to a geodetic datum, and an indication of the nature of the lines that run between the turning points. Yet nearly half of all boundary agreements to date fail to specify a reference datum and around a third do not define the nature of the line segments; more than a quarter define coordinates only to the nearest second of arc. What lies behind such apparent carelessness

Evolution

Until the middle of the twentieth century few coastal states were interested in controlling maritime space beyond a narrow band of territorial sea. However, as governments started to become aware of the resource potential of the continental shelf they began to make more expansive claims, resulting in considerable overlap between areas of claimed jurisdiction. A series of international agreements on the law of the sea were signed in Geneva in 1958. These included the Convention on the Continental Shelf which stated that, in the absence of agreement to the contrary, the boundary between overlapping areas of continental shelf would be the median line every point of which is equidistant from the nearest points on the baselines from which the breadth of the territorial sea of the states in question is measured.

Methods

Following enactment of the Geneva Conventions states began to negotiate their seabed boundaries. However, in the 1960s and 1970s offshore oil production was limited to very shallow waters and few governments saw much point in going to the expense of defining maritime boundaries in deep water to the nearest metre. Even if they wanted to, until the mid-1970s the median line could only be identified using graphical methods. Such methods are almost always significantly less accurâ€“ate than computational methods, as the United Kingdom found to its cost when defining its continental shelf boundary with Norway.

The southern two-thirds of the Norway-UK boundary were defined in 1965 using graphical methods and the northern third in 1978 using computational methods. When the northernmost point of the 1965 line was checked in 1978 it was found to be 331 metres closer to the UK than the true equidistant point. Since Norway was understandably reluctant to redefine an agreed boundary, the two boundary segments were joined by a 331-metre east-west line, and the UK had to accept the â€˜lossâ€™ of a small but potentially oil-rich sliver of North Sea seabed. When even the most carefully plotted graphical median line was likely to have an accuracy of Â±300 metres, it is perhaps understandable that governments werenâ€™t always particularly concerned about datums and other technical issues.
Today there can be no excuse for an imprecisely-defined boundary, and oil and gas companies often want to know the position of a boundary to the nearest metre, or even less. Commercial software tools such as CARIS LOTS make it possible for anyone to construct a median line with precision on any defined ellipsoid, and to calculate the effect of connecting turning points with a loxodrome rather than a geodesic or an arc of a great circle. Even when neighbouring states use different local datums for their mapping, it is usually possible for the technical experts on both sides either to find a mutually acceptable common geodetic reference framework (WGS 84 is becoming increasingly common in maritime boundary definition) or to agree on two sets of coordinates for the same turning points.

Ongoing Ignorance

In such a context it is disappointing that technically deficient boundary agreements are still occasionally signed. It is even more disappointing that the International Court of Justâ€“ice appears not to be equipped to provide a technically rigorous boundary definition. In its 2002 delimitation of the boundary between Cameroon and Nigeria, the Court not only failed to specify which geodetic datum should be used for the maritime boundary, it also misplaced by some 300 metres a point that was supposed to be on the median line between the two coasts. The combined impact of these two errors means that it is unclear whether the productive Bogi oilfield belongs to Cameroon or to Nigeria. If a court or tribunal cannot be guaranteed to deliver a clearly defined boundary, states may well hesitate in future to submit boundary disputes for third-party settlement.

The Median Line

It is important to stress that maritime boundary delimitation is by no means a purely technical exercise. States are free to agree any boundary alignment they choose, and UNCLOS does not specify that the median line is the default boundary for the continental shelf or exclusive economic zone. It is now widely recognised that median lines do not always produce an equitable division of maritime space; for example, in circumstances where the relevant coastlines are markedly concave or where small islands are situated a significant distance offshore of more substantial territory. This is why UNCLOS simply requires that an â€œequitable solutionâ€ be achieved. Nevertheless, most maritime boundaries are based on the median line and courts and tribunals invariably begin by examining the median line and asking whether there are any relevant circumstances that justify a departure from this. Thus every delimitation requires input from a technical

expert capable of constructing the median line and derivatives, such as a line giving â€˜reduced effectâ€™ to certain islands.

Baseline Models

Although the mathematical aspects of generating a median line are now usually handled by computer software, human judgement is still required in building the baseline models between which the median line is constructed. The normal baseline is defined in UNCLOS as the low-water line along the coast as marked on large-scale charts officially recognised by the coastal state; however, low-tide elevations may form part of the baseline only if they are at least partly situated within the territorial sea of the mainland or an island. In many cases the baseline is easily identified, but in areas where the coastline is unstable or where charts are based on very old data the task maybe more complex than at first appears. Satellite imagery and aerial photography can be useful in identifying the baseline in such contexts. When two states use different vertical datums for their charts, technical advice will need to be sought in order to identify appropriate basepoints. Straight and archipelagic baselines, which can have a significant impact on the extent of the territorial sea and other zones of maritime jurisdiction, are usually ignored in boundary delimitation; however, negotiators often want to know what impact such lines would have on the median line were they factored into the equation.

Concluding Remarks

Maritime boundary delimitation is rarely a straightforward task, especially when valuable marine resources are at stake. Although states do not have full sovereignty over maritime space beyond the territorial sea, they are understandably keen to maximise the areas over which they have sovereign rights over living and non-living resources. Population growth and rapid development in many parts of the world are fuelling an ever-increasing demand for such resources, and both governments and commercial operators are investing huge sums in deep-water exploration. Maritime boundaries are no longer only importâ€“ant close to the coast, and new disputes are likely to emerge in areas that were previously considered not to be worth fighting over. While good technical support has always been vital in ensuring that boundaries are accurately defined, in the twenty-first century boundary-makers are going to need geodetic and hydrographic expertise more than ever.

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