Upstream

What do the oil and gas reserves auditors do?

by Tomás de la Calle

Oil and gas reserves cannot be measured: they are estimated. And to come up with such estimates certain methodologies have to be used. Different institutions define them: the stock exchanges where the oil and gas companies are listed, the tax authorities of the countries where these companies operate, and so on. It is not then a universal and straightforward procedure. To cope with this there exist the reserves auditors; that is, companies that perform a role similar to the companies that audit the accounting figures of a corporation. Let´s see then in some detail what is the role and the importance of the oil and gas reserves auditors.

As we noted above the estimation of reserves is a matter of definitions whereby two are of paramount importance: the available extraction technology and the commercial viability of the project under the prevailing economic conditions.

Although the former seems straightforward since it 'just' deals with the technical feasibility to extract oil from a given reservoir, it also has to do with the cost of the pertaining technology. A classical example is offshore operations where the challenge is the water depth (like the pre-salt reservoirs offshore Rio that opened up a new frontier in Brazil.) Another example is the much in vogue shale gas that was made possible (at affordable costs) via two newly applied technologies: horizontal drilling combined with fracturing.

The second consideration, the 'commercial viability' (aka commerciality) of a project, involves six variables that can be split in two sets: tangible and intangible. Tangible refers to the items that can be touched: capex, opex, and production. Intangible refers to the variables that only 'exist' in Excel: the oil price, the discount rate, and the fiscal terms of the country.

Hence, a reserve auditor company should integrate various disciplines, among them: geology, reservoir engineering, economics, and law. While the former two disciplines will deal mostly with the tangible set, the other two will work with the intangibles.

The reserves auditors will address first all the considerations about subsurface issues (i.e. the petroleum system). They should have certain experience or knowledge about the basin they are analyzing to better reflect or model the properties of the fields. This experience will also give them a clue about the capex and opex costs applicable to such a basin and drilling depths. In other words, a good auditor should have enough acumen (and hopefully databases!) to challenge the figures and assumptions that an oil company is presenting to him.

The lawyer and the economic teams will then deal with the 'surface' issues: they should understand the fiscal terms applying to the specific project/license in a given jurisdiction (e.g. royalties, taxes, issues about the E&P contract, etc.) They should also be aware for whom the audit is (a government agency, a stock exchange, etc.) in order to properly reflect the mandatory definitions issued by such authority. For instance, the U.S. Securities and Exchange Commission (SEC) requires that the oil price to be used for a reserve estimation should be the average of the twelve months corresponding to year in which the reserves are being estimated. (The oil price to be considered for each month is that observed on the first working day.) But another authority/institution may adopt a different formula for setting the oil price in the calculations. Special attention should be devoted to the type of reserves to be disclosed; for instance, the US SEC is interested only Proved reserves (P1) while the Canadian Securities Administrators (CSA) considers both Proved and Probable reserves (2P).

Finally, the economic team will integrate all the above into an economic model to assess if the oil to be produced will be a commercial success. Here again considerations about the proper discount rate to use are dictated by the different authorities: the US SEC requires that only 10% be used, while the CSA requires that rates from 0% to 20% be used.
Interestingly enough, the Colombian stock exchange (the Bolsa de Valores de Colombia) does not have any sort of requirements regarding oil reserves disclosures for the oil companies listed there! On the other hand, the ANH requires companies to disclose their reserves and resources every year according to SPE (Society of Petroleum Engineers) rules. Such disclosures are confidential and only for the ANH's eyes; ANH adds up all the reserves and then publishes the total every year.

We have delved into our HCC proprietary database to find out popular names regarding reserves auditors and found these: DeGolyer & MacNaughton; Ryder Scott; Gaffney, Cline & Associates; GLJ; and Petrotech.