In various basin oil fields off their coast, the Brazilians have the distinction of having drilled in the deepest water depth on numerous occasions. A recent example was announced on 4th January 2012, of a find in the Golfinho field at a water depth of 1,520 metres, but then going a further 4,670 metres into the seabed.

In fact, the giant Brazilian oil company Petrobras has refined its expertise, and then applied it to other places in the world, including the US Gulf of Mexico. In September 2009 Petrobras announced its find in the Tiber-1 field off Texas, where the combined total distance of penetration of ocean and seabed to the oil reservoir was at that time a record 35,000 feet.

Brazil has in the last few years identified significant “new” offshore reserves located in what is called the “Sub-Salt” area, which is an oil bearing zone located off the shore of Rio de Janeiro and São Paulo states, lurking beneath a large, subterranean layer of salt several thousand feet thick in places. This poses significant technical challenges, but then offers commensurate returns of high quality crude oil in large quantities, said to be so large a reservoir (with some estimates up to 58 billion barrels) as to be termed a “game changer” regarding Brazil’s relative position in world oil production, with its exploitation likely to place Brazil in the top five oil producing nations in the world. Sub-Salt oil, responsible for just two per cent of production by Petrobras today, is projected to provide 40 per cent of its output by the year 2020. In the year 2011, of 19 major oil and gas discoveries reported in Brazil, 17 were made in the Sub-Salt areas of the Santos, Espirito Santo, and Campos basins.

But this Sub-Salt area is not without numerous additional challenges and some problems. The salt layer through which the drill string must travel is inherently unstable material, making maintenance of the well bore tricky. Then there is the oil itself beneath the salt layer, which tends to be infused in sandy formations, presenting the additional obstacle of sand removal before the oil can be pumped to the surface. Also, at such great depths the temperatures are very cold, causing the oil to be thick and viscous and thus requiring heating up in formation with injection wells. And, as with all offshore fields located up to 350 kilometres off the coast, the logistics of delivering equipment and personnel, and retrieving the oil, are somewhat daunting.
This activity has raised certain political issues and has caused Brazil as a nation to contemplate how it will handle the soon-to-come copious supplies of oil and gas and the accompanying risks of its production. The further out exploration occurs off the coast, the greater the risk that, if an accident occurs, response will take longer and will be more difficult than before. The Brazilian government has attempted to deal with this in its planning, and in the past several years has taken tighter control of these offshore areas, sometimes to the chagrin of foreign oil companies that had previously won bids, but had not yet signed formal leases to explore the areas. There is a new system in place in Brazil now, ending a concession model for exploration and creating a production sharing model, with Petrobras being given a key role and share, but other companies also entering the area and investing in equipment and buying stakes in existing block licences. New auctions of permits cannot begin until lawmakers in Brazil agree on how to divide up the royalty payments between Brazilian states, but that should be resolved in due course.

There have been other developments which should be noted. In November 2011, an incident occurred with oil leakage at the wellhead in the Frade project, located at a depth of 1,200 metres, about 370 kilometres off Rio de Janeiro. This was a site operated by Chevron, with the drilling contractor Transocean. While fortunately it appeared that none of the leaked oil reached shore in Brazil, the incident attracted significant attention, as a cautionary episode that posed a small echo to the DEEPWATER HORIZON incident in 2010.

Brazilian government officials have reacted strongly to this incident, having instituted criminal charges against various Chevron and Transocean executives, which casts serious concerns on the legal environment in which offshore operations in Brazil are conducted. Criminal charges stemming from marine pollution incidents are not unique to Brazil, and their outcome must be awaited.

While the exact circumstances are still being investigated, it is clear that the safety and environmental risks posed by such exploration are always present, and even those with the most experience in the world must take time to learn and update methods on how to avoid, prevent, or at least minimise the effects of such incidents when they occur.

Despite a few setbacks and frequent and ongoing challenges, it is clear that Brazil is moving ahead with its plans for offshore energy development, and if the current estimates are correct, it is poised to be a prominent force in the world’s energy industry for many years to come. Exactly how this will unfold is still uncertain. Emblazoned prominently on the national flag of Brazil is the country’s maxim – “Ordem e Progresso” – Order and Progress – and that motto is being applied to Brazil’s energy exploration offshore. To impose such disciplined operation in remote areas where there are such dynamic conditions and unstable geology will be the true test of the future for those working in offshore energy exploration and production in Brazil.

Sub-Salt area: the denomination is used to designate geologic layers that were formed before a salt layer accumulated above them.

Gard in Brazil: the article on these pages is based on a presentation delivered by Frank Gonynor at a Gard seminar and cocktail reception which took place at the Copacabana Palace, Rio de Janeiro on 22nd November 2011 (above). Brazil is an important market for Gard where there have been significant developments in its portfolio.