

The Search for Oil Offshore Abu Dhabi*

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Introduction

In 1953, a subsidiary of British Petroleum obtained an oil concession of 31,000 square kilometers off the coast of Abu Dhabi ([Figures 1 and 2](#)) from the ruler, Sheikh Shakhbut bin Sultan Al Nahyan ([Figure 3](#)). In 1954, the famous marine explorer, Jacques Cousteau, was contracted to undertake a geological sampling survey of the seabed using his research vessel, Calypso.

At that time, Abu Dhabi was one of seven territories that formed the Trucial Coast and was relatively unknown in the West. Indeed, when Cousteau's wife first heard about her husband's survey, she asked, "Where is Abu Dhabi?" After the survey had been completed, BP went into partnership with Compagnie Française des Pétroles (CFP – later Total) and formed an operating company called Abu Dhabi Marine Areas Ltd. (ADMA), initially owning two-thirds and one-third, respectively.

Two Gulfs, One Solution

The Arabian Gulf was an uncharted sea as far as oil exploration was concerned. BP set up an offshore drilling study group, whose members visited onshore and offshore operations in the Gulf of Mexico in order to make a comparative study. It soon became apparent that methods used there could be applied – without any great alteration – to drilling in the Arabian Gulf. The drilling equipment would be the same; the structures, marine vessels and aircraft would be similar; personnel of the same type would be required; and there would be the same need for detailed advance planning and close supervision during the course of the work.

However, there the similarities ended; for it was immediately apparent that the lack of infrastructure and modern development in the Arabian Gulf region would be major obstacles to progress.

In 1955, ADMA commissioned a geophysical/seismic survey by Geophysical Service Inc. with their seismic vessel, Sonic. Later that year the company chartered the Astrid Sven, an aging 1200-ton freighter, for a further seabed survey. This vessel had an interesting past, having been used by the Germans and Japanese during World War II to refuel their submarines in the Indian and Pacific Oceans. The ship was refitted with living quarters for 30 personnel and was equipped to take borings from the seabed. A deep-sea salvage tug, Dexterous, was also chartered to act

as a tender and to help with the moorings; it maintained radio contact with the United Kingdom, which was a considerable advantage in those pre-satellite and Internet days.

While the Astrid Sven was being fitted out and loaded up with the necessary equipment, the tug sailed to the area with two BP surveyors on board. They marked three prospective drilling locations with buoys. The Astrid Sven arrived at the first location in the Arabian Gulf on Feb. 7, 1956, and began drilling, with the first test boring in 15 meters of water. Four shallow holes were drilled, and from the cores it was discovered that limestone was present to at least 6 meters below the seabed. Tidal readings and metrological observations were made.

On account of bad weather, site survey work at this location was not completed until March 11, due to waves that were more than 10 feet high. Once the weather improved, the survey was able to take borings from the other two sites, and the final marking of the sites was completed by the end of May. Although the operation took two weeks longer than it would have in the summer months, valuable information was gathered about weather conditions and the poor holding qualities of the seabed, as demonstrated by the difficulties experienced in anchoring the vessels.

When it came to considering the type of drilling rig, there were several options available, all based on the types of platforms already used in the Gulf of Mexico in depths of 15 to 30 meters. The fixed type of rig was soon rejected because there were no facilities for constructing one in the Arabian Gulf and because another would have to be built whenever a new well was drilled. The transportable rig, of the type also used off the coast of Qatar, was vulnerable in rough weather when moved between sites. The seabed and depth of waters to be drilled in the Arabian Gulf were not suitable for the submersible barge, which left only those rigs designed by the De Long Corporation of New York. In the end, the company chose a self-contained mobile type – a barge with a jack-up rig – and placed an order with De Long to design and supervise its construction on-site at a shipbuilding yard in Germany.

A Strange and Monstrous Craft

On the basis of the marine surveys, they decided to drill the first exploratory well in the vicinity of an old pearl bank named Umm Shaif; the pearl industry was in terminal decline at this time.

The nearest land to this location was the salt plug of Das Island, which was the obvious choice for an operational base, but otherwise the challenges remained. The island was about 170 kilometers northwest of Abu Dhabi town. In those days, it was the occasional haunt of fishermen and pearl divers sheltering from storms. It was far from the industrialized West – a barren, waterless and lonely place inhabited by seabirds, scorpions, turtles, and rats. Yet the prerequisites were there: a preliminary survey revealed a flat southern half where an airstrip could be built and a northern half with rocky outcrops that could be used to build a small jetty where supply vessels could dock. It was clear, however, that turning this bleak outpost into a hub of oil operations would be a major undertaking.

Once the necessary facilities and a harbor had been constructed on the island, preparations for the arrival of the new drilling platform could begin. On August 23, 1957, the 5250-ton ADMA Enterprise ([Figure 4](#)), as the drilling barge was named, left the shipyard on the Kiel Canal under tow from the tug Thames on a 12,725-kilometer voyage to the Arabian Gulf.

Everyone gathered to see her arrival at Das, for this was the moment they had worked for, but all they could do was watch an unsettled sky, a seething current and the “strange, monstrous craft” making its slow progress under tow. Finally, to the tooting of horns, the barge slowly slipped into the harbor, much to the relief of the managers and the crowd of onlookers gathered on the jetty walls.

On Jan. 4, 1958, after six weeks of almost non-stop work during which the top of the rig and extensions to the legs were fitted, the ADMA Enterprise was gently eased out of the harbor. In choppy conditions, tugs towed the platform some 40 kilometers to the location for Well No. 1 at Umm Shaif. The journey was a difficult one, more so because there were no radios on the tugs, leaving those on the platform to communicate with their crews using lamps.

Once the rig was in place and raised on its legs, the routine of drilling could begin. Ten weeks later, something remarkable happened, as resident geologist Keith Todd explained: “The routine was broken one night when one of the rig crew woke me with a tray of cuttings and the message ‘The driller says you ought to see this.’ There was no mistaking the smell of oil. There was no drama, just an awareness that, if the rock conditions were right, we could be about to change the fortunes of the region.”

Making Mud

According to John Turnbull, a petroleum engineer on the ADMA Enterprise, the first sign that something was afoot was when the well started “making mud.” While this was a typical sign of a discovery, it also brought a real risk of disaster.

The blowout preventers were closed and barite was loaded into the mud to increase its weight. The well was “killed” by pumping the heavier mud into the drill pipe; oil was bled under control from the annulus mud column. Only when the columns were balanced and checked and double-checked was it confirmed that the first oil had been struck at a depth of about 2700 meters in the Lower Cretaceous Thamama limestones, and subsequent drilling located gas in a separate reservoir below the Hith Anhydrite.

The oil quality was good (36 degrees API) but – ironically – news of the discovery was greeted with “general gloom” in BP’s London headquarters on account of a global surplus of oil at the time. However, the discovery could not be ignored, and by late November 1959, the field was ready for production.

The Monks of Das

There was much work to be done before the base could become fully functional. A building program went apace – living quarters went up first, followed by an industrial area with general, cement and chemical stores, workshops, an ice plant, a power station, an administration center, a hospital, and a mosque and kitchen for the local workers’ camp

Accommodation was basic, but there was a wide range of recreational activities, such as golf, swimming, cricket, darts and fishing. Nevertheless, it was far removed from civilization, and women were not allowed on the island; hence employees posted there were light-

heartedly referred to as “the monks of Das.” Such was the isolation of this “Alcatraz of the East” that new arrivals were warned not to attempt an escape as the sharks would have them.

On the industrial side, the producing wells were to be linked by submarine pipelines to a gathering 180-ton platform (or “hub”) in the middle of the field and then to Das Island. Separators were provided for degassing the crude oil on its arrival, and tanks were built to store it. A tanker-loading jetty was constructed 1.4 kilometers offshore. The harbor area was extended in order to accommodate a growing fleet of barges, tugs, and service craft. Meanwhile, for local fishermen, the Umm Shaif wellheads provided a convenient place to hang up their nets.

A Sea of Crude

After a period of refitting, the ADMA Enterprise was towed back to Umm Shaif in order to recommence drilling, and by January 1962, five more wells had been completed, making eight in all. The work of erecting production towers on six of these was taken on by a new self-elevating barge, which arrived in April. This barge, the ADMA Constructor, was similar in design to the ADMA Enterprise, but was fitted with a large 100-ton-capacity crane instead of a drilling rig. The barge had been built in Great Britain at a cost of £1.25 million (\$1.81 million). Its first task was to build the gathering platform.

On June 11, 1962, production began and the facilities necessary to give the Umm Shaif field an initial output of some 1.5 million tons of crude oil a year were commissioned. Four weeks later the British Signal, the first tanker to carry a full cargo of Umm Shaif oil, sailed for BP’s Aden Refinery with 33,500 tons of crude oil on board.

By April 1963, a total of 12 wells were operating or ready to join the production network in the Umm Shaif field. But this was only the start – another promising undersea structure had been located 80 kilometers to the southeast. Here a new exploratory well was drilled – the first of many in a supergiant oil field named Zakum. Two drilling rigs would now divide their time between Umm Shaif, Zakum, and occasional exploration elsewhere. More wells were opened at Umm Shaif so that, by the end of 1964, the production rate of that field had risen to 3.75 million tons a year from 22 wells.

The dream of bringing oil wealth to the region was realized, but whether Sheikh Shakhbut was convinced that it would bring happiness was uncertain. Being a conservative ruler, he may have preferred that the oil remain in the ground.

His parsimony gave rise to many apocryphal stories. In one, he was said to have kept all his money in a shoebox under his bed. However, he was a thoughtful ruler, and his resistance to change derived from a desire to protect the traditional ways. He maintained a keen interest in operations, and was often briefed by company executives and geologists on developments in the field.

Aftermath

Umm Shaif was an important discovery, revealing the potential of Cretaceous carbonate reservoirs in the region. Zakum is now the biggest oil field in Abu Dhabi and one of the largest offshore fields in the world. The ADMA partners decided to push ahead with developing the lower

reservoir layers, but declined to take part in the development of the more difficult upper reservoirs. As a result, two new companies were created: ADMA-OPCO to operate the lower field and the Zakum Development Company (ZADCO) for the upper field.

The Abu Dhabi government now has a 60-percent stake in the oil industry through the Abu Dhabi National Oil Company (ADNOC). ADMA-OPCO continues to operate the Umm Shaif field while more foreign oil companies have been admitted to offshore ventures in Abu Dhabi.

Abu Dhabi has been transformed, of course. In 1963, many local people lived in ‘arish (palm-frond) huts and there was little infrastructure. By 1971, there were roads, an international airport, telephones, and the like. Das had mushroomed into a small city, with a population of 7000. The island is still an important hub today; it also houses a gas liquefaction plant, which processes gas from the oil fields as well from the vast Khuff gas reservoirs that lie under the Abu Al Bukhoosh and Umm Shaif fields.

In 1966, Sheikh Shakhbut was succeeded by his brother Zayed and, five years later, the emirate of Abu Dhabi joined the United Arab Emirates (UAE). Nowadays, Abu Dhabi city is a modern conurbation and capital of the UAE, one of the richest countries in the world.

Acknowledgements

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Author

Quentin Morton ([Figure 5](#)) grew up in Qatar, Bahrain, and Abu Dhabi in the 1950s and 1960s. A barrister, he has written a number of books and articles on the history of oil exploration in the Middle East. His latest book, “Buraimi: The Struggle for Power and Oil in Arabia,” tells the story of the battle over energy resources in the region during the 1950s. His father, D.M. “Mike” Morton, was an exploration geologist with the Iraq Petroleum Company.

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Figure 1. Map showing the principal hydrocarbon fields of the UAE.



Figure 2. Abu Dhabi in 1949 (photos courtesy of BP Archive).



Figure 3. Arrival of Sheikh Shakhbut at Das Island, October 28, 1962.

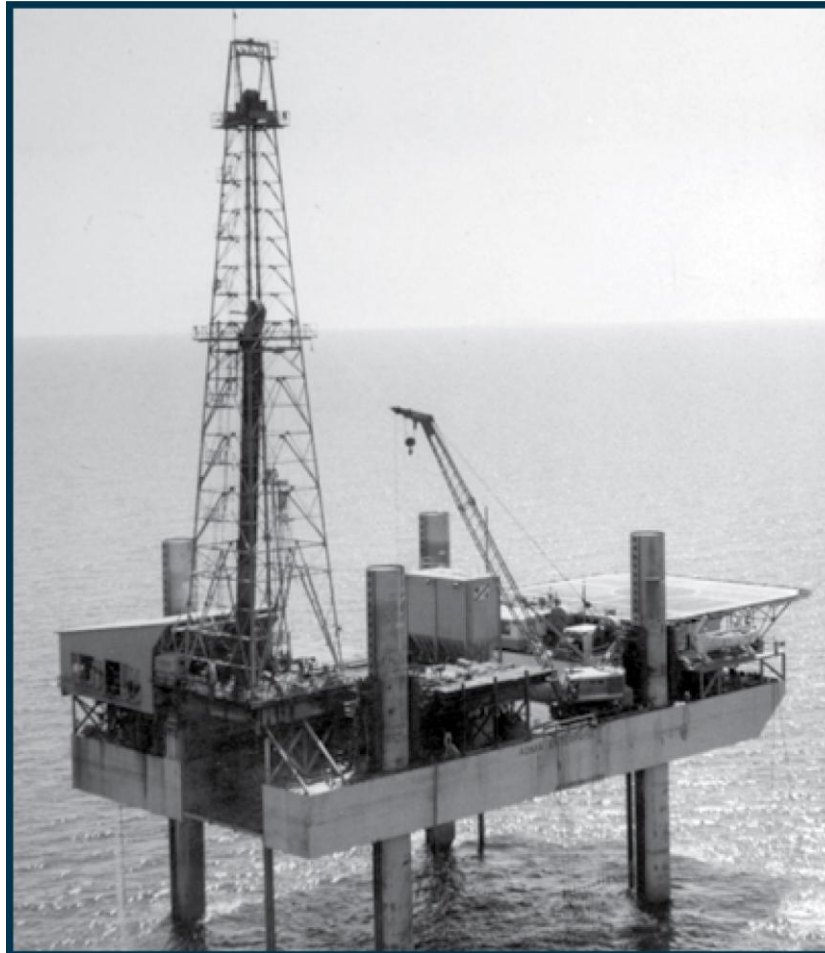


Figure 4 ADMA Enterprise in the Arabian Gulf.



Figure 5. Quentin Morton, author.