

COVER STORY

Taweelah: Abu Dhabi's power and water puzzle

FOR five frustrating years, a windswept stretch of desert on the UAE's Gulf coast has been the focus of hope for government planners and international contractors alike. The Taweelah site was chosen to house one of the Gulf's biggest power and desalination plants — one that, in scale and complexity, was designed to rival the huge installations built in Saudi Arabia and Kuwait over the past 10 years.

Plans for the \$6,000 million scheme — drafted by a partnership of West Germany's Lahmeyer International and Egypt's Dr Ali al-Saie — envisaged a complex to meet the bulk of the UAE's power needs and a significant proportion of its water requirements. They called for Taweelah to produce up to 3,000 MW of electricity and 100 million gallons of water a day.

Two factors combined to alter the blueprint, however. First, the slump in oil revenues and the subsequent exodus of overseas workers — whose arrival helped to double the UAE's population to just above 1 million between 1975-80 — forced sharp downward revisions in demand projections. A study of Abu Dhabi's consumption patterns forecast that power demand would rise to nearly 1,500 MW in 1985: in fact, peak consumption this year has been little above two-thirds of this figure.

Second, the UAE's fragmented political structure made it virtually impossible to co-ordinate the scheme, analysts say. The fact that each of the larger emirates — Abu Dhabi, Dubai and Sharjah — has its own utilities department meant Abu Dhabi's vision of a truly national power and water system came to grief over conflicting development programmes.

At the same time, there is a federal ministry overseeing utility developments in Ajman, Ras al-Khaimah, Umm al-Qaiwain and Fujairah. Adding to the confusion are the oil companies, which organise their own power needs, and the utilities put in place by the federal military authorities.

The result is that Taweelah — possibly the last great scheme planned for Abu Dhabi in the next 10 years — will go ahead, but on a greatly reduced scale. Water supply plans have been trimmed, as has projected electricity output. The scale of the reduction in output can be gauged from the fact that the station's revised

MEPhA/Steve Smith



Water use in Abu Dhabi city alone totals more than 60 million gallons a day

first-phase electricity production is less than one-tenth of the original target. Nevertheless, it will be enough to meet Abu Dhabi's requirements until the mid-1990s.

The US' General Electric (GE) was finally awarded a \$72 million contract to supply and install three 70-MW gas turbines for the scheme's first phase in July. By the time the order was let, contractors had faced four years of delays and revisions.

The first contracts for site and other preliminary work at the three-square-kilometre Taweelah site were awarded in 1981. It became apparent not long afterwards that the downward trend in expatriate employment, plus difficulties in co-ordinating the scheme, would entail a substantial revision of plans. This happened in 1982: out went the idea of a national grid, to be replaced by the more modest aim of providing power and water supplies for Abu Dhabi alone. In came a bigger consulting team: Ali al-Saie was made overall consultant; Lahmeyer was

Job	Contractor	Value
Supply and installation of three 7 million-gallon-a-day distillation units	Societe Internationale de Dessalement (Sidem — France)	\$ 160 million
Supply and installation of three 70-MW gas turbines	General Electric (US)	\$ 68.1 million, plus Dh 14.9 million (\$ 4.1 million)
Civil works	Consolidated Contractors International Company (CCC — Lebanon/Greece)	Dh 138 million (\$ 37.6 million)
Sea-water intake	Six Construct (Belgium)	Dh 83 million (\$ 22.6 million)
Electrical equipment	Merlin-Gerin (France)	\$ 15 million
Approach road	Al-Wimpey Road & Construction Abu Dhabi	Dh 61 million (\$ 16.6 million)
Offshore marine works	Dong Ah Construction Industrial Company (South Korea)	Dh 48 million (\$ 13.1 million)
Preparation of three-square-kilometre site	Swissboring Overseas Corporation (Dubai), with Sesam (France)	Dh 5.5 million (\$ 1.5 million)
Hydrographic survey for water outflows	RKS Surveys (UK)	Dh 4.5 million (\$ 1.2 million)
Test pilings	Ricoh Soil Investigations (Japan)	Dh 2.6 million (\$ 700,000)
Aerial study	Middle East Aerial Photogrammetric Surveys (MAPS — Sharjah)	Dh 187,000 (\$ 51,000)

Contracts to be let

- Pipeline from Taweelah to reservoir no 4 at Bani Yas, via the new Abu Dhabi international airport (NADIA)
- Construction of a new reservoir at NADIA — this was originally planned for Bu Muraika
- Gas pipeline from Maqta to Taweelah. This project is for Abu Dhabi National Oil Company (ADNOC)

left with responsibility for the civil works on the power side; the UK's Merz & McLellan was hired as specialist consultant for the turbines, and a second British company, Pencol, was brought in as consultant for water distribution.

At the end of 1982, the contract to supply and install distillation units with a capacity of 21 million gallons a day went to the French. Contractors' problems then began in earnest.

Bids for the order to supply the gas turbines were invited in early 1983. Re-bids followed in March, July and

TAWEELAH POWER AND DESALINATION COMPLEX: WHO DOES WHAT

It is nearly five years since the first contracts — for site preparation — were awarded for the Taweelah power and desalination complex.

The next order to be placed was for the distillation units — let to France's Sidem in late 1982. Since then, there have been seven rounds of bidding for the gas turbine supply contract, ending with an award to GE in July.

The civil works contract, which eventually went to CCC in August 1984, was also re-bid several times as WED tried to lower prices as much as possible.

The most active year for the project was 1984 — contracts were awarded for the sea-water intake, the electrical equipment contract, offshore marine works and the approach road. The client for the approach road is the public works department.

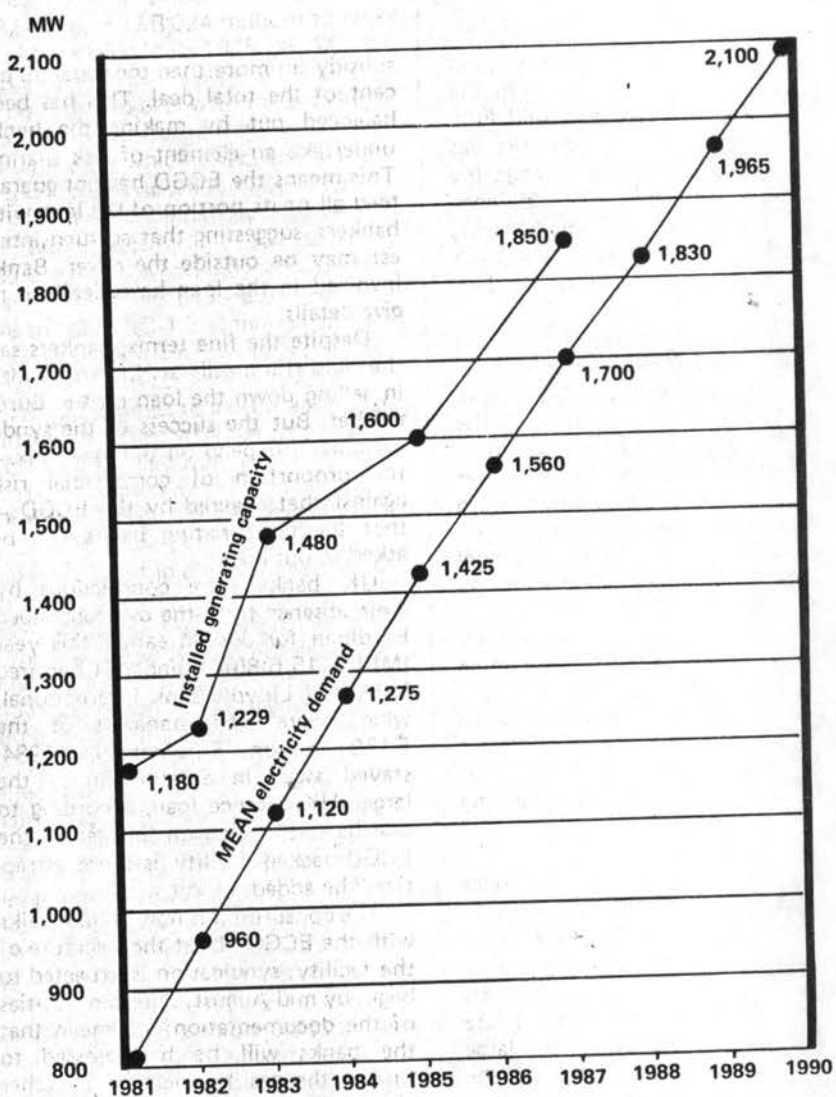
The final part of the project — for water distribution — is still being worked out by WED with UK consultant Pencol. It is not yet clear whether the water from the plant will be supplied to Al-Ain, as well as Abu Dhabi.

November 1984; tenders were reassessed in May that year. The process seemed set to continue in 1985, when rebids were invited in January and again in June. It was this last call that led to GE's award, however.

By the final round of bidding, the UK's John Brown Engineering and Italy's Fiat TTG had dropped out. Moreover, GE was selected over the heads of the lowest bidders, West Germany's Brown Boveri & Compagnie, and a joint venture of Belgium's Ateliers de Constructions Electriques de Charleroi and Japan's Toyo Construction Company.

The first phase is for completion in 30 months. But questions are already being asked about the adequacy of the planned water supplies. Abu Dhabi city has enough water for its 330,000 inhabitants, who each use about 150 gallons a day. The 180,000 or so people living outside the city each need, on average, 86 gallons a

Abu Dhabi: estimated power needs and installed capacity, 1981-90



Abu Dhabi is unlikely to embark on any big new power schemes in the next 10 years. A study done six years ago projected electricity demand at 1,425 MW in 1985, rising steadily

to 2,100 MW by 1990. However, according to local industry observers, demand this year has hovered at about 1,000 MW, even during the hot summer months

day. But to this must be added Al-Ain's huge requirement for water for agriculture, forestry and municipal landscaping, which comes to about 185 million gallons a day — or three times Abu Dhabi city's total water use.

Al-Ain gets 2 million gallons of desalinated water a day from Umm al-Nar, the emirate's biggest power and desalination complex. The rest comes from its own aquifers. But according to some estimates, the aquifers will run out of fresh water in 10-15 years and of all water in 20-30 years, at the present rate of use. If Abu Dhabi's original plan for a national water grid had gone ahead, Al-Ain would

have no problems; as it is, it may well have to revise its agricultural plans.

Taweelah's next stage calls for doubling water desalination capacity to more than 40 million gallons a day, as well as increasing power output. If it goes ahead, a pipeline may be installed to carry water to Al-Ain.

In the meantime, Al-Ain will have to learn to conserve its water — probably by changing its farming policy radically. Water reserves are under great pressure, say analysts: if consumption continues at the present rate, they could decline to critical levels.

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