

# Directorate of **POWER and**



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حكومة ابو ظبي

دائرة الماء والكهرباء

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محطات التشغيل

1986

operating

results

JAEA  
33.9100953  
62  
OPERES  
1986

1900

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1900年

CENTRE FOR ARAB GULF STUDIES

UNIVERSITY OF EXETER

- 8 NOV 1990

# 1986 OPERATING RESULTS

1986 OPERATING RESULTS

# 1986 OPERATING RESULTS

REPORT # TS / GP & MS / 16 / 87 / 2



NOTES ON OPERATING RESULTS

1986

Weather

1. 1986 was notable for a warm spring and a wet December.

Comparison with the long term temperature means showed January through to April and September through to December close to normal. May, July and August were all slightly above normal.

Rainfall was slightly above average for the year at 54.4 mm recorded at Bateen Airport. Rain fell in the months of January, February, April and December. December rainfall was the highest at 29.5mm since records were kept.

Demand

2. Power demand growth registered an increase of 6.9% for the system (Abu Dhabi - Al Ain combined). Abu Dhabi peak demand increased by 9.4% while Al Ain's growth was at 10.3% (Page 12).
3. Energy demand in Abu Dhabi went up by 8.7% and in Al Ain by 12.9%. Overall increase in energy demand was up by 9.8% (Page 14).

A net total of 1,097.616 GWh of energy was exported to Al Ain in 1986 compared to 854.044 GWh in 1985 and 776.640 GWh in 1984. An increase of 28.52% over 1985. (Page 14 & 49).

The net energy imported by Al Ain represents 73.9% of its total energy demand.

4. Water production increased by 13.8% over 1985 by seawater desalination plants.

Water export to Al Ain amounted to 2,088.79 million gallons i.e 5.72 MG a day. This is a significant increase from 1985 when the average daily water export to Al Ain was only 1.65 MG. (Page 49.)

The actual increase in water usage in Abu Dhabi (ie excluding water exported to Al Ain) was 5.7% over that of 1985.

5. There was no blackouts in 1986. The system availability excepting a few minor incidents was excellent throughout the year.

#### Capacity

6. Steam Turbo Generator Unit No.7 at Umm Al Nar West having an output of 160 MW was added to the system in the month of December increasing System Generation Capacity from 1261 MW to 1421 MW. The generating capacity will be augmented further when Unit No.8 at Umm Al Nar West is expected to be commissioned in the month of October 1987.(Page 62).
7. Total water production capacity increased from 64 MG in 1985 to 79 MG in 1986 when units 7.2, 8.1 and 8.2 at Umm Al Nar West each with a capacity of 5 MG were commissioned in March, May & July, respectively.(Page 63)

#### Fuel

8. The specific fuel cost decreased from Dh 49.12 to Dh 15.94 mainly because of reduction of natural gas price. The gas price was reduced from Dh 12.60 per million Btu in 1985 to Dh 4.00 per million Btu in 1986. Furthermore, the gas oil price was also reduced twice, once in July from Dh 3.50 to Dh.3.20 per gallon, then again in September when it was further reduced to Dh 2.90 per gallon (Page 16,25).
9. In keeping with the national objective, consumption of all liquid fuel including Al Ain were brought down. In actual quantities of gas oil consumption in 1986 went down by 53.3% of 1985 consumption. Crude oil and Fuel oil likewise registered a fall of 0.9% and 61.4%, respectively. (Page 15).

#### Personnel

10. Total number of employees stood at 1833 by the end of 1986, a rise of only 28 employees for 1985. Excluding Abu Dhabi Workshop, Training Centre and Umm Al Nar Stores personnel, these figures are 1427 and 1401 for 1986 and 1985 respectively.
11. Total employee benefit (salary,allowances etc) went down from Dhs 122,766,840 in 1985 to 121,900,914 in 1986, inspite of the increase in number of employees from 1805 to 1833. However, the total labour cost went up from Dhs 127,673,990 to Dhs 146,440,134. The increase in cost is basically due to the maintenance contracts awarded to outside parties which went up from Dhs 4.9 million in 1985 to Dhs 24.5 millions in 1986. (Page 3,31 & 76)

12. Employee productivity improved for power plants from 0.78 persons/MW in 1985 to 0.73 persons/MW in 1986 - an improvement of 6%. Likewise for Desalination Plants the figures were 12.73 persons/MGD and 10.04 persons/MGD respectively- an improvement of 21%. Further, the operating efficiency also went up from a total heat utilisation of 49.21% in 1985 to 51.42% in 1986. That is, there has been an overall improvement in performance over 1985.

Production Costs (Abu Dhabi Area Only)

13. Because of the drastic reduction in natural gas price (item 8) the hitherto top most expenditure of FUEL dropped down to the second position and the depreciation occupied the highest place. Depreciation accounted 43.9% of the total cost whereas fuel accounted 38.2% of the total.
14. Plant DEPRECIATION costs was Dh 467,500,541 which constituted 43.9% of the total cost. A change in method or policy of depreciation allocation can substantially lower the unit cost of production. (Page 3 & 33).
15. The total OPERATION cost for Abu Dhabi area for 1985 was Dh 1,064,266,643 as compared to Dh 1,754,977,322 for 1986, a decrease of expenditure by 39.4%. This appreciable reduction was, as mentioned before, due to improvement in performance as well as the reduction of Natural gas and gas oil prices. During the same period the growth of electricity generation has been 12.3% and water production 13.8%. (Page 3 & 4)
16. The TOTAL unit production cost of energy decreased from Dh 0.2573/kWh to Dh 0.1253/kWh. Production cost of water decreased from Dh 31.01/1000 gals to Dh 20.02/1000 gals. (Page 3 & 4)
17. Total heat utilisation increased from 49.21% to 51.42%. (Page -17)
18. Overall, the system was operated more economically than in 1985 which resulted in a net saving of 626.73 Giga kcal. This is equivalent to Dhs 29.36 million based on 1985 fuel price. A savings of over Dh 80,000 per day !! (Page -18)







LIST OF FIGURES

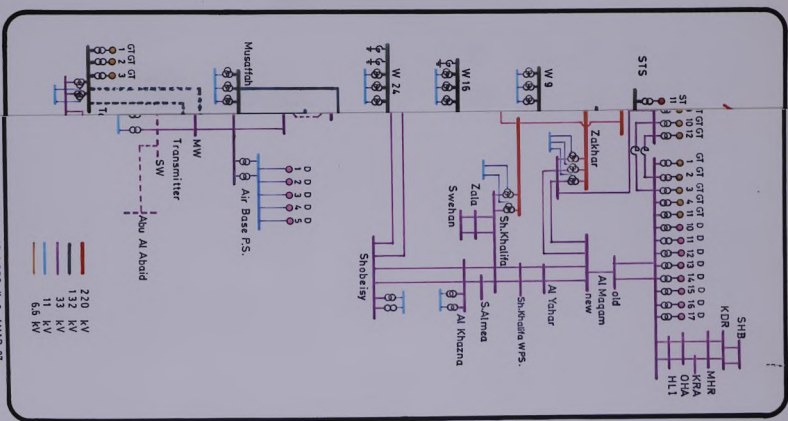
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Operating Results  
The following table sets forth the operating results of the Company for the periods indicated. All amounts are in millions of dollars, except per share amounts.

	1997	1996
Operating income	\$1,234	\$1,123
Operating expenses	(1,000)	(950)
Operating profit	\$234	\$173
Income tax expense	(50)	(40)
Net income	\$184	\$133
Basic earnings per share	\$1.84	\$1.33
Diluted earnings per share	\$1.78	\$1.28



## OPERATING RESULTS





PERFORMANCE INDICATORS FOR ABU DHABI GRID (EXCLUDING AL AW)

1982 - 1986

	1983	1984	1985	1986
<b>Electricity</b>				
1. Peak Demand on Abu Dhabi grid (MW)	718.0	723.3	777.0	850.0
2. Total Energy Generated - million kWh	3,672.3	4,306.6	4,661.9	5,236.7
3. Total Energy Distributed - million kWh	3,240.1	3,841.8	4,186.8	4,767.2
<b>Water</b>				
1. Total Water - produced million gals	15,511	16,837	17,905	20,380
2. Total Water - supplied million gals	15,119	16,228	17,445	19,941
<b>Production Cost</b>				
1. Fuel price in Dirhams per million k cal	51.90	48.33	49.12	15.94
2. Total Production cost (Dhs) of Electricity per kWh exported	0.3079	0.2926	0.2865	0.1377
3. Total Production cost (Dhs) of water per 1000 gals	32.59	29.77	31.01	20.02
<b>Manpower Productivity</b>				
1. Total number of employees in all Power Stations	1,743	1,798	1,805	1,833
2. Total number of employees in Power Stations connected to the Grid	1,670 <sup>1</sup>	1,763	1,805	1,833
3. Employees associated with Electricity	879	1,002	990	1,040
4. Employees associated with Water	778	761	815	793
7. Rated Power Generation capacity MW	955	1,282	1,261	1,421
8. Rated water production capacity MGD	63	59	64	79
9. Employees per MW of rated capacity	0.92	0.78	0.78	0.73
10. Employees per MGD of rated capacity	12.35	12.90	12.73	10.04
<b>System Heat Utilization</b>				
1. Electricity (excluding auxiliaries for water)	15.29%	15.84%	16.44%	16.67%
2. Water (including electrical consumption for auxiliaries)	36.53%	32.90%	32.71%	34.15%
3. Total Heat Utilization	51.82%	48.74%	49.21%	51.42%
4. Total losses	48.18%	51.26%	50.79%	48.58%

1. For costing purpose 22 persons from central and workshop are allocated to Saadiyat area.

TOTAL AND UNIT COST OF PRODUCTION  
 -----  
 (Excluding Isolated Generation & AI in Power Station)  
1985

Cost Item	Proportion of cost between		Total Production Cost		Production Cost (Dhs)	
	Electricity	Water	Dhs	%	Electricity	Water
1. Fuel	72.93%	27.07%	1,130,703,552	64.45%	824,653,484	306,050,068
2. Labour (persons)	990	815	127,674,831	7.3%	67,995,426	59,679,405
3. Material	44.60%	55.40%	40,721,966	2.3%	18,162,028	22,559,938
4. Depreciation	63.36%	36.64%	455,876,973	26.0%	288,838,473	167,038,500
Total			1,754,977,322	100.0%	1,399,649,411	555,327,911
			Electric Energy distr'd	kWh	4,186,796,015	-
			Water produced	MG	-	117,905.68
			Unit cost of Production		Dh 0.2865/kWh	Dh 31.01/1000gal

1986

Cost Item	Proportion of cost between		Total Production Cost		Production Cost (Dhs)	
	Electricity	Water	Dhs	%	Electricity	Water
1. Fuel	72.28%	29.72%	406,646,987	38.2%	285,794,474	120,852,513
2. Labour (persons)	1040	793	146,440,134	13.8%	80,863,488	65,576,646
3. Material	60.91%	39.09%	43,678,981	4.1%	26,605,850	17,073,131
4. Depreciation	56.27%	43.73%	467,500,541	43.9%	263,057,578	204,442,963
Total			1,064,266,643	100.0%	656,321,390	407,945,253
			Electric Energy distr'd	kWh	4,767,224,262	-
			Water Produced	MG	-	120,380
			Unit cost of Production		Dh 0.1377/kWh	Dh 20.02/1000gal

\* Without SDS



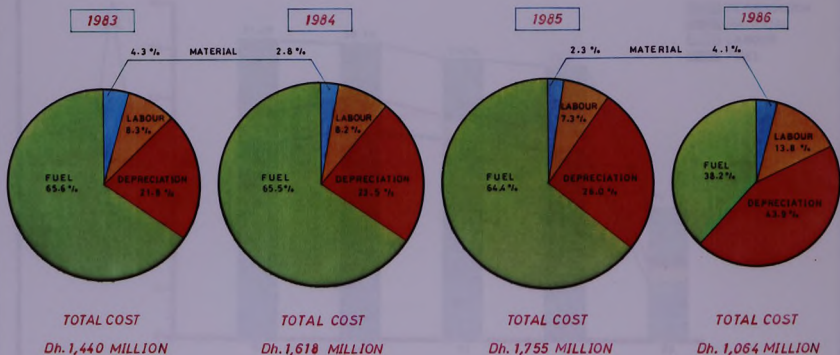
STATIONWISE COST OF PRODUCTION

ABU DHABI GRID - 1986

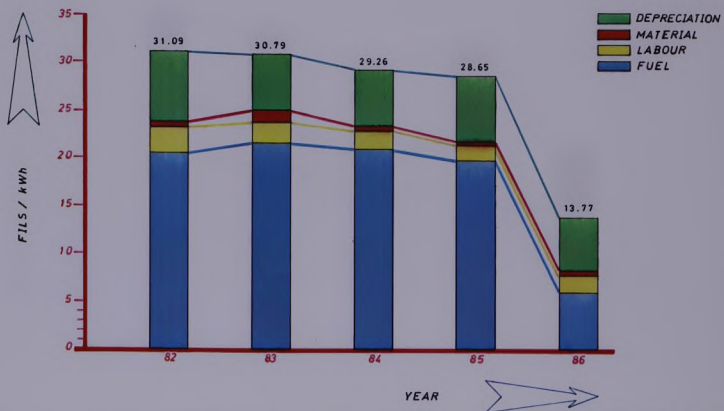
Station	GR	SR	UNR	UNW	UNB	9410	SPB/SPS	RYB	SPS	TOTAL	
<b>ELECTRICAL ENERGY :</b>											
Production kWh	720,016,000	607,970,450	1,072,994,450	1,680,427,775	--	695,467,000	1,051,000	456,977,000	1,776,000	5,236,679,675	
Internal consumption:											
kWh	30,230,906	130,044,942	50,656,701	203,328,284	--	49,068,000	31,530	5,951,250	143,800	469,455,413	
Energy distribution :											
kWh	689,785,094	477,925,508	1,022,337,749	1,477,099,491	--	646,399,000	1,019,470	451,025,750	1,632,200	4,767,224,262	
<b>WATER :</b>											
Production MG	669.19	3,533.64	4,465.99	11,687.68	6.92	--	16.24	--	--	20,379.66	
Supply MG		4,160.95		15,763.85		--	16.26	--	--	19,941.06	
<b>COST APPORTIONMENT TO ELECTRICITY:</b>											
Fuel Dh	62,464,040	19,685,966	68,344,692	74,281,983	--	34,090,291	230,676	25,976,844	719,982	285,794,474	
Materials Dh	4,207,202	9,483,937	2,176,840	8,063,190	--	74,379	160,659	2,439,613	N/A	24,805,850	
Personnel Dh	16,383,831	16,058,088	10,066,260	21,338,526	--	3,914,659	2,157,057	9,427,138	1,517,929	80,863,488	
Depreciation Dh	<u>32,061,754</u>	<u>29,095,257</u>	<u>48,048,505</u>	<u>78,192,567</u>	--	<u>41,285,824</u>	<u>6,327,988</u>	<u>24,493,299</u>	<u>3,552,384</u>	<u>263,057,578</u>	
Total Dh	115,116,827	74,323,308	128,636,297	181,076,266	--	79,365,153	8,876,350	62,336,894	5,790,295	656,321,390	
<b>COST APPORTIONMENT TO WATER :</b>											
Fuel Dh	5,518,912	20,316,169	18,487,068	74,819,002	--	--	1,711,362	--	--	120,852,513	
Materials Dh	3,933,785	2,442,910	4,753,184	5,462,947	--	--	280,305	--	--	17,073,131	
Personnel Dh	16,850,793	12,862,440	12,782,556	20,604,236	--	--	2,476,621	--	--	65,376,644	
Depreciation Dh	<u>18,290,478</u>	<u>34,294,305</u>	<u>36,998,895</u>	<u>114,066,499</u>	--	--	<u>792,786</u>	--	--	<u>204,442,363</u>	
Total Dh	44,593,968	70,115,824	73,021,703	214,952,684	--	--	5,261,074	--	--	407,945,253	
<b>UNIT COST OF PRODUCTION:</b>											
<b>Electricity:</b>											
Gross - fils/kWh	15.99	12.22	11.99	10.82	--	--	11.41	844.56	13.64	326.03	12.53
Net - fils/kWh	16.69	15.55	12.58	12.31	--	--	12.28	870.68	13.82	354.75	13.77
<b>Water:</b>											
Gross - Dh/1000 gals	66.64	19.84	16.35	18.39	--	--	323.96	--	--	20.02	

Year	1983	1984	1985	1986
Revenue	1,440	1,618	1,755	1,064
Operating Expenses	1,100	1,200	1,300	800
Operating Profit	340	418	455	264
Depreciation	218	225	280	438
Labour	83	82	73	138
Fuel	654	655	644	382
Material	43	28	23	41

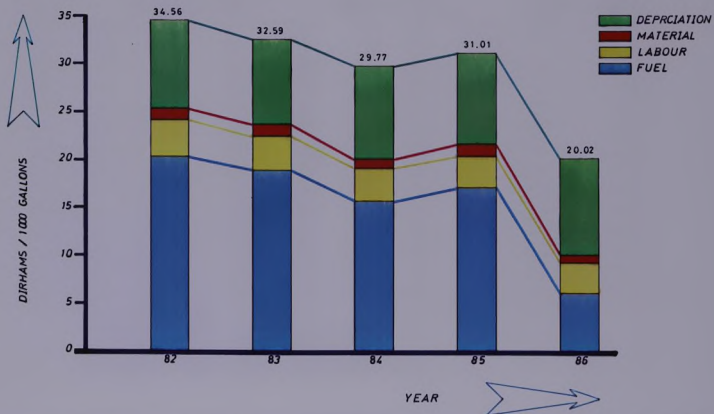
## TOTAL PRODUCTION COST ELECTRICITY & WATER



## ELECTRICITY PRODUCTION COST PER UNIT



### WATER PRODUCTION COST PER UNIT



PER CAPITA ANNUAL ELECTRICITY CONSUMPTION\*

ABU DHABI, AL AIN & COMBINED

Y A R	A B U D H A B I			A L A I N			C O M B I N E D		
	Population:	Electric Energy Distributed:	Per Capita Annual Consumption:	Population:	Electric Energy Distributed:	Per Capita Annual Consumption:	Population:	Electric Energy Distributed:	Per Capita Annual Consumption:
		GWh *	KWh		GWh *	KWh		GWh *	KWh
1974	105,000	347.322	3,372	39,500	51.451	1,303	142,500	398.773	2,798
1975	127,800 @	497.059	3,889	50,700 @	78.058	1,540	178,500@	575.117	3,222
1976	141,400	653.498	4,622	56,600	118.051	2,086	198,000	771.549	3,897
1977	157,000	938.999	5,981	61,900	189.373	3,059	218,900	1,128.372	5,155
1978	175,200	1,085.533	6,196	67,800	255.731	3,772	243,000	1,341.264	5,520
1979	206,800	1,379.090	6,669	83,100	379.228	4,564	289,900	1,758.318	6,065
1980	243,000 @	1,698.784	6,991	101,700@	529.602	5,207	344,700@	2,228.386	6,465
1981 \$	262,900	1,985.246	7,551	110,000	664.704	6,043	372,900	2,649.950	7,106
1982 \$	284,500	2,268.473	7,974	119,100	802.567	6,739	403,600	3,071.040	7,609
1983 \$	307,800	2,526.100	8,207	128,800	948.397	7,363	436,600	3,474.497	7,958
1984 \$	333,100	2,759.329	8,284	139,400	1,059.179	7,598	472,500	3,818.508	8,081
1985 \$	360,400	2,999.591	8,323	150,800	1,163.922	7,718	511,200	4,163.513	8,145
1986 \$	389,900	3,302.647	8,470	163,200	1,319.970	8,088	553,100	4,622.617	8,358

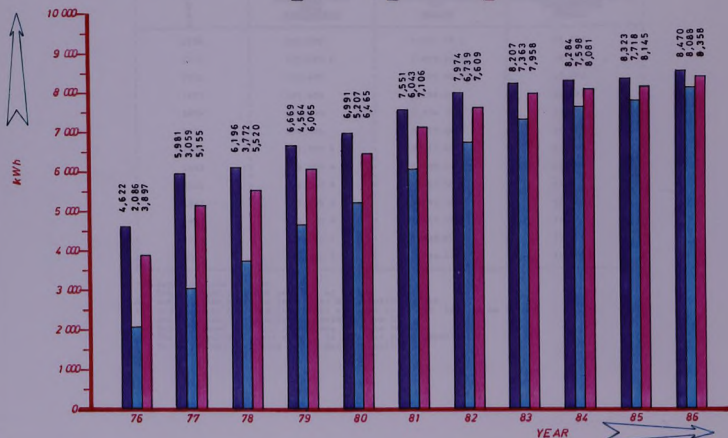
\*. Table revised in 1986.

.. Actual electric energy exported from power stations less 10% as distribution loss for Abu Dhabi & 7% for Al Ain

@. Actual Census figures, others are estimate only.

\$ The population figures from 1981 to 1986 are provisional, based on 1985 census which is estimated as average growth of 8.2%.

## PER CAPITA ANNUAL ELECTRICITY CONSUMPTION (ABU DHABI, AL AIN AND COMBINED)



PER CAPITA ANNUAL WATER CONSUMPTION\*

ABU DHABI CITY NETWORK

<u>Y</u>	<u>ABU DHABI CITY</u>	<u>WATER CONSUMPTION</u>	<u>PER CAPITA ANNUAL WATER</u>
<u>E</u>	<u>CITY</u>	<u>10<sup>6</sup></u>	<u>CONSUMPTION</u>
<u>A</u>	<u>POPULATION</u>	<u>GALLON</u>	<u>GALLON</u>
<u>E</u>			
1974	103,000	1,717.76 *	16,677
1975	127,800 †	1,852.33 *	14,494
1976	141,400	2,383.04 *	16,853
1977	157,000	3,498.43 *	22,283
1978	175,200	4,764.72 *	27,196
1979	206,800	7,197.20 †	34,803
1980	243,000 †	10,043.40 †	41,331
1981	262,900 *	11,920.60 †	45,343
1982	284,500 *	13,651.50 †	47,984
1983	307,800 *	14,363.32 †	46,664
1984	333,100 *	14,944.09 X	44,864
1985	360,400 *	15,999.81 X	44,395
1986	389,900 *	16,959.66 X	43,497

\*. Table revised in 1986.

†. Actual water produced less 10% as losses

‡. Actual water supplied less 5% as Distribution losses.

X. Actual water supplied less water exported to Al Ain, less 5% as losses.

‡. Saadiyat water production is included from 1984.

§. Actual Census figures, others are estimate only.

¶. The population figures of 1981 to 1986 are provisional.

¶. To be revised when 1985 census data is available.

## PER CAPITA ANNUAL WATER CONSUMPTION

(ABU DHABI AREA)





ANNUAL OPERATING RESULT FOR ABU DHABI P & D STATIONS

1984 - 1986

1.0 LOAD STATISTICS

	Units	1984	1985	1986
<b>1.1 Peak Load Registered</b>				
System	MW	973.3	1,063.0	1,136.0
Date		July 22nd	Aug 5th	Jul 27th
Time		15:00 hrs	15:00 hrs	16:00 hrs
% increase over previous year		1.6%	9.2%	6.3%
Abu Dhabi Area	MW	723.3	777.0	850.0
Date and time		July 22nd	Aug 5th	Aug 9th
Time		15:00 hrs	14:00 hrs	15:00 hrs
% increase over previous year		0.7%	7.4%	9.4%
Al Ain Area	MW	261.0	291.0	321.0
Date and time		July 2nd	Aug 5th	May 25th
Time		14:00 hrs	15:00 hrs	14:00 hrs
% increase over previous year		3.2%	11.5%	10.3%
<b>1.2 Minimum Load Registered</b>				
System	MW	212.0	229.0	248.0
Abu Dhabi	MW	150.0	166.0	181.0
Al Ain	MW	40.0	50.0	60.0
<b>1.3 (a) System Availability at the time of peak demand</b>				
	MW	1,130.0	1,240.0	1,292.0
<b>(b) Total Spinning Capacity at time of peak demand</b>				
	MW	1,067.0	1,150.0	1,207.0
<b>(c) Spinning Reserve</b>				
	%	13.57	8.18	9.15

ANNUAL OPERATING RESULT FOR ABU DHABI P & D STATIONS

1984 - 1986

2.0 ENERGY GENERATION

2.1 Energy Generation by Fuel  
DPS, GTS, STS, UWE, UWM, 9 & 10, BVS, SPS & AIN :

	Units	1984	1985	1986
1. Natural Gas	KWh	3,969,991,315	4,523,359,365	5,016,181,954
2. Crude Oil	KWh	614,015,512	516,591,500	566,221,800
3. Gas Oil	KWh	111,086,873	82,942,918	32,251,091
4. Fuel Oil	KWh	32,468,175	965,852	10,191,300
<b>Total</b>		<b>4,727,561,875</b>	<b>5,123,859,635</b>	<b>5,624,846,145</b>

2.2 Energy Generation by Station

	KWh		KWh		KWh	
1. DPS	2,621,000	0.05 %	2,599,000	0.05 %	1,776,000	0.03 %
2. GTS	738,828,000	15.63 %	667,938,000	13.04 %	720,016,000	12.80 %
3. STS	586,596,926	12.41 %	667,347,150	13.02 %	607,970,450	10.81 %
4. UWE	888,712,450	18.80 %	1,115,688,412	21.77 %	1,072,994,450	19.08 %
5. UWM	1,482,494,600	31.36 %	1,359,442,700	26.53 %	1,680,427,775	29.88 %
6. 9 & 10	327,339,200	6.92 %	373,774,000	7.29 %	695,467,000	12.36 %
7. BVS	254,614,960	5.39 %	270,841,953	5.29 %	456,977,000	8.12 %
8. SPS	25,364,250	0.53 %	4,233,540	0.08 %	1,051,000	0.02 %
9. AIN	420,990,489	8.91 %	461,994,880	9.02 %	388,166,470	6.90 %
<b>Total</b>	<b>4,727,561,875</b>	<b>100.00 %</b>	<b>5,123,859,635</b>	<b>100.00 %</b>	<b>5,624,846,145</b>	<b>100.00 %</b>

2.3 Total Energy Generation by Area  
Abu Dhabi Area  
Al Ain Area

Abu Dhabi Area	KWh	4,306,571,386	4,661,864,755	5,236,679,675
Al Ain Area	KWh	420,990,489	461,994,880	388,166,470

ANNUAL OPERATING RESULT FOR ABU DHABI P & D STATIONS

-----  
 1984 - 1986  
 -----

2.0 ENERGY GENERATION (Cont)

2.4 Auxiliary Consumption

	Units	1984	1985	1986
1. DPS	kWh	181,400 6.9 %*	184,900 7.1 %*	143,800 8.1 %*
2. GTS	kWh	36,384,400 4.9 %	27,919,740 4.1 %	30,230,906 4.2 %
3. STS	kWh	122,802,345 20.9 %	137,964,763 20.6 %	130,044,942 21.3 %
4. UNW	kWh	55,485,501 6.2 %	54,449,482 4.8 %	50,656,701 4.7 %
5. UNW	kWh	223,017,310 15.0 %	210,237,752 15.4 %	203,328,284 12.1 %
6. 9 & 10	kWh	22,046,500 6.7 %	39,288,000 6.8 %	49,068,000 7.0 %
7. BYE	kWh	4,087,909 1.6 %	4,897,097 1.8 %	5,951,250 1.3 %
8. SPE	kWh	760,930 3.0 % <sup>†</sup>	127,006 3.0 % <sup>†</sup>	31,530 3.0 % <sup>†</sup>
9. AIN	kWh	33,679,239 8.0 % <sup>†</sup>	36,959,590 8.0 % <sup>†</sup>	31,053,318 8.0 % <sup>†</sup>
Total	kWh	498,445,534 10.5 %	512,028,330 10.0 %	500,508,731 8.9 %

\* as % of station's generation

† Saadiyat auxiliary consumption is not available. 3.0% of generation is taken as approximation

- Al Ain actual figures are not available, 8 % is recommended by station.

2.5 Energy Export to Al Ain

Total energy exported to Al Ain	kWh	775,556,000	854,100,000	1,097,848,000
Total energy imported from Al Ain	kWh	912,000	56,000	232,000
Net energy exported to Al Ain	kWh	776,444,000	854,044,000	1,097,616,000

2.6 Area Energy Demand

System	kWh	4,727,561,875	5,123,859,635	5,624,846,145
Increase over previous year		9.2 %	8.4 %	9.8 %
Abu Dhabi Area	kWh	3,529,927,386	3,807,820,755	4,139,043,675
Increase over previous year		8.9 %	7.9 %	8.7 %
Al Ain Area	kWh	1,197,634,489	1,316,038,880	1,485,782,470
Increase over previous year		9.2 %	9.9 %	12.9 %

ANNUAL OPERATING RESULT FOR ABU DHABI P & D STATIONS

1984 - 1986

3.0 FUEL CONSUMPTION (GRID)

		Units	1984	1985	1986
3.1 Natural Gas	GTS	mil Soft	20,115.83	16,116.75	14,815.61
	SFS	mil Soft	7,863.03	8,431.96	9,003.33
	UNE	mil Soft	18,197.16	19,755.40	19,765.53
	UW	mil Soft	22,824.41	28,095.55	32,589.58
	9 & 10	mil Soft	3,017.12	5,893.39	7,261.17
	BYS	mil Soft	2,592.59	3,455.02	5,892.31
	Total	mil Soft	74,610.14	81,748.07	89,327.53
3.2 Crude Oil	GTS	gals	NIL	NIL	164,100.00
	SFS	gals	781,355	6,973,000	2,971,780
	UW	gals	36,380,014	12,166,292	22,914,015
	AIN	gals	40,506,509	40,703,821	33,262,701
	Total	gals	77,667,878	59,845,113	59,312,596
3.3 Gas Oil	SFS	gals	357,778	286,260	203,800
	GTS	gals	170,152	181,883	1,121,209
	UNE	gals	1,176,875	5,236,215	381,507
	9 & 10	gals	16,533	20,031	141,410
	BYS	gals	4,253,510	53,294	138,768
	SFS	gals	1,921,963	348,472	67,057
	SIS	gals	552,865	459,522	452,827
	AIN	gals	2,606,380	3,392,671	1,175,802
	Total	gals	11,056,456	7,978,378	3,722,380
3.4 Fuel Oil	UNE	gals	39,901	1,784,019	34,865
	9 & 10	gals	2,332,684	129,414	703,699
	Total	gals	2,372,585	1,913,433	738,564

1984 - 1986

ANNUAL OPERATING RESULT FOR ABU DHABI P & D STATIONS

1984 - 1986

3.0 FUEL CONSUMPTION (GRID)

3.5 Fuel Cost (Excluding Al Ain Power Station)

	Units	1984	1985	1986
1. Natural Gas	Dhs	1,011,294,762	1,098,758,534	386,095,962
2. Crude Oil	Dhs	13,413,517	7,030,325	9,440,680
3. Gas Oil	Dhs	27,213,452	18,496,036	8,710,012
4. Fuel Oil	Dhs	7,693,427	6,218,657	2,400,333
Total	Dhs	1,059,615,178	1,130,703,552	406,646,987

3.6 Heat Value (Excluding Al Ain Power Station)

1. Natural gas	giga kcal	20,073.112	91.6 %	21,976.577	95.47 %	24,325.602	95.35 %
2. Crude Oil	giga kcal	1,498.554	6.8 %	770.303	3.35 %	1,047.777	4.11 %
3. Gas Oil	giga kcal	248.260	1.1 %	188.484	0.82 %	106.194	0.42 %
4. Fuel Oil	giga kcal	104.002	0.5 %	83.812	0.36 %	32.349	0.12 %
Total	giga kcal	21,923.928	100.00 %	23,019.176	100.00 %	25,511.922	100.00 %

3.7 Specific Fuel Cost

lh/ml kcal	48.33	49.12	15.94
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ANNUAL OPERATING RESULT FOR ABU DHABI P & D STATIONS

1984 - 1986

3.0 FUEL CONSUMPTION (GRID)

3.8 Electrical energy consumed by Distiller for 1984, 1985 & 1986

	Units	1984	1985	1986
GTS (Weir)	0.0145 kWh/gal	mil kWh	15.828	* 9.115
STS (Sidem)	0.0263 kWh/gal	mil kWh	89.045	99.739
UNE (Sidem)	0.0088 kWh/gal	mil kWh	43.728	43.063
UM (IHL)	0.0127 kWh/gal	mil kWh	93.637	108.869
Total	mil kWh	242.238	260.786	290.373
Average Electricity Consumption	kWh/gal	0.0144	0.0146	0.0142

3.9 Gross Heat Utilization (Excluding Al Ain Power Station)

Elec : (2.2 - 3.8) x 859.85 kcal/kWh	giga kcal	3,473.117	15.84 %	3,784.268	16.44 %	4,253.082	16.67 %
Water : Energy consumed as per Manufacturers Guarantee plus 3.8 x 859.85	giga kcal	7,213.587	32.90 %	7,544.436	32.77 %	8,865.020	34.75 %
For 1984, 1985 & 1986							
GTS (Weir)	296.513 kcal/gal						
STS (Sidem)	421.423 kcal/gal						
UNE (Sidem)	417.104 kcal/gal						
UM (IHL)	431.600 kcal/gal						
STS (FFS A c)	1099.000 kcal/gal						
& ( 1265.000 kcal/gal) for 1986							
Total heat utilization	giga kcal	10,686.704	48.74 %	11,328.704	49.21 %	13,118.102	51.42 %
Total heat loss	giga kcal	11,277.224	51.26 %	11,690.472	50.79 %	12,393.820	48.58 %

ANNUAL OPERATING RESULT FOR ABU DHABI P & D STATIONS

1984 - 1986

3.10 Heat Rate		3.0 FUEL CONSUMPTION (GRID)			
(a) Per kWh Generation		Units	1984	1985	1986
1.	DPS	kcal/kWh	5,640	4,527	4,786
2.	CTS	kcal/kWh	6,708	6,025	5,218
3.	STS	kcal/kWh	2,217	2,329	2,079
4.	UNE	kcal/kWh	3,287	3,832	3,963
5.	UMS	kcal/kWh	2,937	3,145	2,904
6.	9 & 10	kcal/kWh	2,797	2,776	2,895
7.	EYS	kcal/kWh	3,428	3,438	3,525
8.	SPS	kcal/kWh	3,131	3,383	2,861
9.	AIN	kcal/kWh	4,130	3,848	3,573
	Average	kcal/kWh	3,730	3,602	3,400
(b) Per Imperial gallon of water produced					
1.	CTS	kcal/gal	428	507	496
2.	STS	kcal/gal	250	262	369
3.	UNE	kcal/gal	311	254	258
4.	UMS	kcal/gal	443	439	421
5.	SDS	kcal/gal	1,110	1,099	1,265
	Average	kcal/gal	364	354	379

ANNUAL OPERATING RESULT FOR ABUHAIBI P & D STATIONS

1984 - 1986

4.0 WATER PRODUCTION & SUPPLY

4.1 WATER PRODUCTION

	Units	1984	1985	1986
GTS (Weir)	mil gals	1,091.56	6.48 % 628.62	3.51 % 669.19
STS (Sides)	mil gals	3,969.74	20.11 % 3,792.37	21.18 % 3,533.64
UNE (Sides)	mil gals	4,969.05	29.51 % 4,893.58	27.33 % 465.99
UNW (IH)	mil gals	7,373.01	43.79 % 8,572.34	47.87 % 11,687.68
UNS (Sanskura)	mil gals	0.00	0.00 % 4.58	0.03 % 6.92
SDS (A Ch. & F Field)	mil gals	17.29	0.11 % 14.33	0.08 % 16.24
<b>Total</b>	<b>mil gals</b>	<b>16,836.65</b>	<b>100.00 % 17,905.82</b>	<b>100.00 % 20,379.66</b>
Total water exported to Al Ain this year	mil gals	497.79	603.30	2,088.79
Average daily water production	mil gals	46.00	49.06	55.83

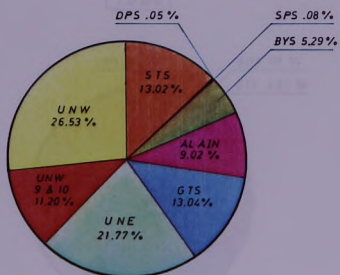
4.2 WATER SUPPLY

GTS & STS	mil gals	4,431.60	4,309.17	4,160.95
UNR & UNW & UNS	mil gals	11,780.00	13,121.31	15,763.85
SDS	mil gals	16.81	14.72	16.26
<b>Total</b>	<b>mil gals</b>	<b>16,228.41</b>	<b>17,445.20</b>	<b>19,941.06</b>
Average daily water supply	mil gals	44.34	47.80	54.63



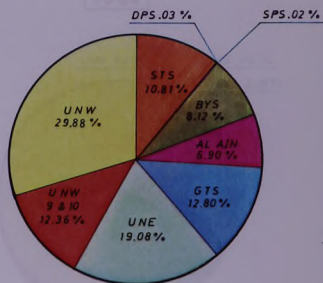
## ELECTRICAL ENERGY GENERATION BY STATION

**1985**



**TOTAL : 5,123.860 x 10<sup>6</sup> kWh**  
**PEAK MONTH PRODUCTION**  
**AUG - 647.884 x 10<sup>6</sup> kWh**

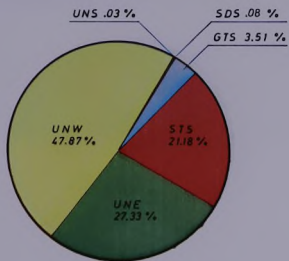
**1986**



**TOTAL : 5,624.846 x 10<sup>6</sup> kWh**  
**PEAK MONTH PRODUCTION**  
**JULY - 685.829 x 10<sup>6</sup> kWh**

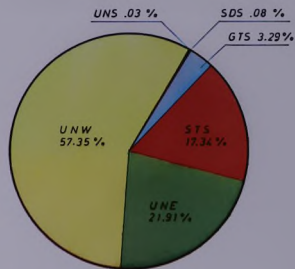
## WATER PRODUCTION BY STATION

1985



TOTAL : 17,906 x 10<sup>6</sup> GALLONS

1986



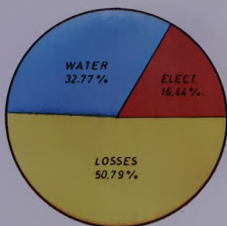
TOTAL : 20,380 x 10<sup>6</sup> GALLONS

## HEAT UTILIZATION

(FOR ABU DHABI AREA ONLY)

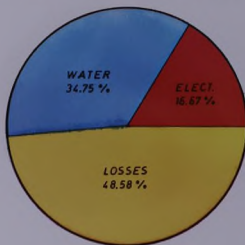
1985

TOTAL HEAT 23,019 X 10<sup>9</sup> kcal  
OVERALL HEAT UTILIZATION 49.21 %  
EFFICIENCY POWER GENERATION 16.44 %



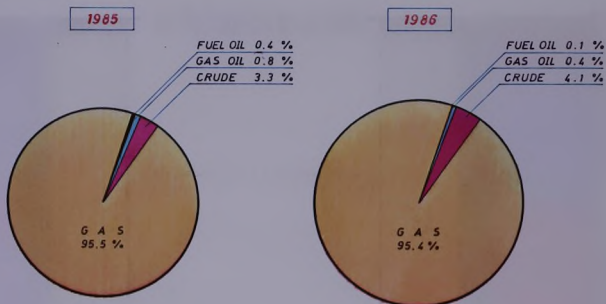
1986

TOTAL HEAT 25,512 X 10<sup>9</sup> kcal  
OVERALL HEAT UTILIZATION 51.42 %  
EFFICIENCY POWER GENERATION 16.67 %



## HEAT ENERGY CONSUMPTION BY FUEL

(EXCLUDING ALAIN)



TOTAL: 23,019.176 X 10<sup>9</sup> kcal

TOTAL: 25,511.922 X 10<sup>9</sup> kcal

## ENERGY BALANCE DIAGRAM

(EXCLUDING AL ADN)

1985

1986



FUEL PRICE RATES FOR DIFFERENT STATIONS

1986

MONTH	NATURAL GAS		GAS OIL						CRUDE OIL				FUEL OIL						
	PRICE DHS/1000	CAL VALUE 1000 BTU	U.A.R. MU.A.N. DHS/1000	A.B.P.S. DHS/1000	S.P.84. DHS/1000	AL- DHS/1000	SWELAN- DHS/1000	K-CAL/GAL DHS/1000	U.A.R. DHS/1000	A.B.P.S. DHS/1000	AL- DHS/1000	K-CAL/GAL DHS/1000	U.A.R. DHS/1000	A.B.P.S. DHS/1000	AL- DHS/1000	K-CAL/GAL DHS/1000	U.A.R. DHS/1000	A.B.P.S. DHS/1000	AL- DHS/1000
JAN	2.00	1,049.21	3.90	3.90	3.90	3.90	3.90	3.90	4.00	3.90	3.90	41,708.67	0.36	0.38	0.42	240,221.77	3.25	3.25	43,800.40
FEB	2.00	1,061.27	3.90	3.90	3.90	3.90	3.90	3.90	4.00	3.90	3.90	41,708.67	0.36	0.38	0.42	240,221.77	3.25	3.25	43,800.40
MAR	2.00	1,061.00	3.90	3.90	3.90	3.90	3.90	3.90	4.00	3.90	3.90	41,708.67	0.36	0.38	0.42	240,221.77	3.25	3.25	43,800.40
APR	2.00	1,065.00	3.90	3.90	3.90	3.90	3.90	3.90	4.00	3.90	3.90	41,708.67	0.36	0.38	0.42	240,221.77	3.25	3.25	43,800.40
MAY	4.00	1,070.00	3.90	3.90	3.90	3.90	3.90	3.90	3.60	3.90	3.90	41,708.67	0.36	0.38	0.42	240,221.77	3.25	3.25	43,800.40
JUN	4.00	1,069.00	3.90	3.90	3.90	3.90	3.90	3.90	3.60	3.90	3.90	41,708.67	0.36	0.38	0.42	240,221.77	3.25	3.25	43,800.40
JUL	4.00	1,091.80	3.20	3.20	3.42	3.20	3.20	3.30	3.20	3.20	3.20	41,708.67	0.36	0.38	0.42	240,221.77	3.25	3.25	43,800.40
AUG	4.00	1,096.00	3.20	3.20	3.20	3.20	3.20	3.30	3.20	3.20	3.20	41,708.67	0.36	0.38	0.42	240,221.77	3.25	3.25	43,800.40
SEP	4.00	1,089.00	2.90	2.90	2.90	2.90	2.90	3.00	2.90	2.90	2.90	41,708.67	0.36	0.38	0.42	240,221.77	3.25	3.25	43,800.40
OCT	4.00	1,077.00	2.90	2.90	2.90	2.90	2.90	3.00	2.90	2.90	2.90	41,708.67	0.36	0.38	0.42	240,221.77	3.25	3.25	43,800.40
NOV	4.00	1,080.00	2.90	2.90	2.90	2.90	2.90	3.00	2.90	2.90	2.90	41,708.67	0.36	0.38	0.42	240,221.77	3.25	3.25	43,800.40
DEC	4.00	1,089.00	2.90	2.90	2.90	2.90	2.90	3.00	2.90	2.90	2.90	41,708.67	0.36	0.38	0.42	240,221.77	3.25	3.25	43,800.40

\* Indicates fuel price changes.

CRUDE OIL TRANSPORT CHARGES FOR DIFFERENT STATIONS FOR THE YEAR 1986

FROM	TO	PRICE DHS/GAL	PRICE DHS/1000
U.A.N REFINERY	ABU DHABI	0.0250	0.8750
JABAL DHANA	ABU DHABI	0.1100	3.8500
HAFESAN	AL AIN	0.0900	3.1500
U.A.N REFINERY	AL AIN	0.0700	2.4500
JABAL DHANA	AL AIN	0.1400	4.9000

FUEL CONSUMPTION FOR ALL STATIONS

1984

* MONTH *	* GAS TURBINE STATION *			* STEAM TURBINE STATION *			* UMM-AL-QASR EAST *			* UMM-AL-QASR WEST *			* UNIT NO 9 & 10 *			* MONTH *
	W.GAS 10 <sup>6</sup>	CRD.OIL 10 <sup>6</sup>	FUEL.OIL 10 <sup>6</sup>	W.GAS 10 <sup>6</sup>	CRD.OIL 10 <sup>6</sup>	FUEL.OIL 10 <sup>6</sup>	W.GAS 10 <sup>6</sup>	CRD.OIL 10 <sup>6</sup>	FUEL.OIL 10 <sup>6</sup>	W.GAS 10 <sup>6</sup>	CRD.OIL 10 <sup>6</sup>	FUEL.OIL 10 <sup>6</sup>	W.GAS 10 <sup>6</sup>	CRD.OIL 10 <sup>6</sup>	FUEL.OIL 10 <sup>6</sup>	
* JAN *	315.86	WIL	4.091	652.08	16.720	1,323.27	5,710	WIL	1,182.55	1,384.579	234.60	WIL	WIL	WIL	* JAN *	
* FEB *	966.29	WIL	WIL	541.40	WIL	706.49	5,279	2,420	1,910.95	1,925.389	279.17	WIL	WIL	10,236	* FEB *	
* MAR *	652.40	WIL	2,895	626.86	33,000	1,321.73	4,610	4,839	2,032.24	392.205	703.59	1,289	28,154	WIL	* MAR *	
* APR *	1,171.01	WIL	8,011	494.43	WIL	951.43	48,724	8,139	2,704.92	WIL	650.54	WIL	75,009	WIL	* APR *	
* MAY *	1,988.18	WIL	WIL	767.07	440	1,422.28	34,083	WIL	3,144.25	2,916.858	839.20	WIL	28,156	WIL	* MAY *	
* JUN *	1,822.74	RA.1001	445,882	787.95	463,320	1,864.50	29,334	WIL	3,375.17	1,780.548	844.06	WIL	WIL	WIL	* JUN *	
* JUL *	1,972.70	RD.0001	344,341	915.32	951,280	2,419.07	28,837	330	3,106.60	2,081.718	648.10	74,130	3,027	WIL	* JUL *	
* AUG *	1,475.44	WIL	98,014	1,032.63	117,060	2,449.86	113,272	724	3,445.15	2,470.032	677.49	WIL	91,001	WIL	* AUG *	
* SEP *	1,594.00	WIL	12,490	850.20	608,740	2,007.63	16,896	WIL	3,262.91	997.700	847.80	WIL	128,175	WIL	* SEP *	
* OCT *	1,144.63	WIL	1,420	949.08	342,100	2,109.80	41,574	12,648	2,969.37	669.806	892.83	65,991	8,135	WIL	* OCT *	
* NOV *	888.49	WIL	1,665	459.00	439,540	1,464.95	10,178	WIL	2,552.88	1,005.180	422.77	WIL	278,921	WIL	* NOV *	
* DEC *	653.45	WIL	WIL	247.11	1,740	1,473.87	42,894	5,743	2,783.47	WIL	220.82	WIL	2,519	WIL	* DEC *	
* TOTAL *	*114,815.61	184,1001,121,209	*9,003.33	2,971,780	19,765.53	381,507	34,865	132,589	581,22	914,015	17,241.17	143,410	703,699	WIL	* TOTAL *	
* FUEL *															* FUEL *	

continued to next page

FUEL CONSUMPTION FOR ALL STATIONS

MMB

* MONTH *	* MONTHS *						TOTAL INDIVIDUAL FUEL CONSUMPTION					
	W.GAS	GAS.OIL	CRU.OIL	COAS.OIL	GAS.OIL	GAS.OIL	W.GAS	CRUDE.OIL	GAS.OIL	FUEL.OIL	MONTH	
* 10 <sup>6</sup> *	* GAL *	* GAL *	* GAL *	* GAL *	* GAL *	* 10 <sup>6</sup> *	* GAL *	* GAL *	* GAL *	* GAL *		
JAN	215.19	60,784	1,340,045	47,840	520	1,240	44,406	3,943.65	9,361,344	166,642	JAN	
FEB	303.32	19,280	1,037,838	22,028	39,850	14,732	32,893	4,707.06	3,003,227	134,262	FEB	
MAR	247.63	2,958	727,431	15,473	4,030	1,081	26,243	5,404.51	1,157,436	48,888	MAR	
APR	521.14	2,761	2,355,539	36,076	3,900	2,853	35,594	6,693.92	2,355,539	137,019	APR	
MAY	400.74	2,413	7,046,928	243,007	91,270	6,025	53,188	8,781.72	10,064,226	449,984	MAY	
JUN	750.83	345	3,367,948	448,036	33,310	3,180	49,626	9,425.25	6,303,736	1,209,713	JUN	
JUL	492.43	2,071	5,141,745	104,004	13,440	7,371	35,282	9,844.22	9,454,743	411,832	JUL	
AUG	481.18	26,231	3,248,314	53,403	3,940	5,843	37,573	9,981.85	5,855,404	338,882	AUG	
SEP	639.82	6,514	3,173,799	21,080	2,340	5,590	47,906	9,131.74	4,780,239	143,016	SEP	
OCT	564.49	7,372	3,165,917	48,592	4,030	5,550	36,773	8,429.20	4,137,820	231,247	OCT	
NOV	340.72	4,788	972,286	23,183	2,470	4,301	47,219	6,530.67	2,417,024	93,804	NOV	
DEC	314.21	3,278	384,893	22,440	2,400	8,925	35,924	5,992.94	384,651	116,081	DEC	
TOTAL	15,492.31	138,748	133,242,701.11	1,75,802,203,800	67,057	492,827	89,327.53	59,312,596	3,722,380	738,564	TOTAL	
FUEL											FUEL	



FUEL CONSUMPTION COST ( DIRHAMS ) FOR DIFFERENT STATIONS

YEAR 1986

MONTH	OSM TURBINE STATION			STEAM TURBINE STATION			RAMTAS			AL - AIR			S.D.S
	NATURAL GAS	CRUDE OIL	GAS OIL	NATURAL GAS	CRUDE OIL	GAS OIL	NATURAL GAS	CRUDE OIL	GAS OIL	GAS	CRUDE OIL	GAS	
JAN	1,266,638.13		23,754.90	2,734,067.11	6,353.60		902,157.24	237,065.40		823,218.90		186,654.00	177,624.00
FEB	4,135,450.64			2,317,040.41			1,248,124.67	75,192.00		452,491.96		85,959.20	133,972.00
MAR	2,774,004.80		11,280.50	2,665,408.72	32,540.00		1,138,212.88	11,575.20		305,521.02		61,124.70	145,372.00
APR	4,988,502.60		31,242.90	2,959,123.80			2,220,269.40	10,267.90		989,326.28		140,694.40	142,376.00
MAY	8,505,410.40			3,283,059.60			167.20	2,571,167.20		8,445.50		2,268,109.76	920,524.50
JUN	7,910,421.60	31,928	2,240,587.00	3,332,403.00	175,225.60		3,258,602.20	1,207.50		1,466,246.76		1,568,126.00	178,653.60
JUL	9,615,175.44	30,400	1,178,330.22	3,997,385.50	781,486.40		3,023,880.30	6,486.40		2,159,532.90		332,812.80	116,430.60
AUG	7,278,480.16		317,444.80	4,485,744.72	44,482.80		2,959,045.92	83,939.20		1,372,491.88		172,169.60	121,950.80
SEP	6,765,224.00		36,801.00	3,703,471.20	123,321.20		2,787,055.92	18,890.40		1,332,995.58		206,132.00	143,718.00
OCT	5,022,634.44		4,118.00	4,164,563.04	129,998.00		2,476,982.12	21,393.20		1,329,485.14		198,916.80	110,319.00
NOV	3,618,968.00		4,828.00	2,846,880.00	147,032.80		1,471,910.40	13,485.20		408,240.12		67,232.70	143,657.00
DEC	2,844,253.96			2,783,211.16			668.80	1,370,876.76		9,506.20		161,654.22	65,134.00
TOTAL													
BY FUEL	64,055,996.17	62,358	13,844,597.82	38,872,858.26	11,129,276.40		25,478,490.01	498,354.40		13,970,334.42		4,005,430.70	13,713,361.90
TOTAL													
BY STATION			67,982,951.99		40,002,124.66		25,976,844.41			17,975,765.12			13,713,361.90

Continued to next page

FUEL CONSUMPTION COST ( DOLLARS ) FOR DIFFERENT STATIONS

YEAR 1956

MONTH	DOM-AL-BAR EAST			DOM-AL-BAR WEST			9 & 10			D.P.G.		
	NATURAL GAS	GAS OIL	FUEL OIL	NATURAL GAS	CRUDE OIL		NATURAL GAS	GAS OIL	FUEL OIL	NATURAL GAS	GAS OIL	FUEL OIL
JAN	5,548,259.39	22,304.10	WIL	5,000,171.24	2,658,448.44		983,640.26	WIL	WIL	2,028.00	5,049.00	
FEB	3,024,435.33	20,588.10	7,865.00	8,178,502.32	493,140.04		3,194,769.43	WIL	34,437.00	1355,805.00	58,288.00	
MAR	5,619,995.96	18,014.10	115,726.75	8,441,084.48	141,193.80		2,451,684.88	5,027.10	91,507.00	15,717.00	4,324.00	
APR	4,653,943.80	190,023.60	126,451.75	11,522,959.20	WIL		2,771,300.40	WIL	243,779.25	15,210.00	11,412.00	
MAY	6,087,358.40	119,283.50	WIL	13,542,990.00	1,078,868.88		3,551,776.00	WIL	91,507.00	1319,445.00	21,690.00	
JUN	8,091,930.00	101,469.00	WIL	14,648,237.80	644,507.28		3,643,220.40	WIL	WIL	1136,585.00	11,448.00	
JUL	10,564,562.50	92,278.40	1,072.50	13,940,191.52	1,181,418.48		2,830,382.32	237,236.00	9,837.75	49,408.00	24,884.30	
AUG	10,727,748.64	362,790.40	2,359.50	14,945,731.60	889,211.52		2,943,885.26	WIL	295,753.25	12,608.00	19,631.70	
SEP	8,875,916.28	48,398.40	WIL	14,210,535.24	359,172.00		3,653,016.80	WIL	329,068.75	4,786.00	16,770.00	
OCT	9,233,414.40	120,564.60	141,106.00	13,029,595.54	241,130.16		3,937,738.04	191,379.90	26,451.75	11,687.00	16,770.00	
NOV	7,201,224.00	29,216.20	WIL	11,027,145.60	361,884.80		3,826,266.40	WIL	906,493.25	7,163.00	12,993.00	
DEC	6,418,217.52	124,392.60	118,729.75	12,124,795.32	WIL		961,891.92	WIL	8,186.75	7,540.00	26,775.00	
TOTAL	85,467,026.22	1,251,423.00	1113,311.25	140,851,939.80	8,249,045.40		31,369,652.01	433,617.00	2,287,021.75	7719,982.00	1230,676.00	
BY FUEL												
TOTAL												
BY STATION	86,831,760.47			149,100,985.20			34,090,290.76		719,982.00	1230,676.00		

Continued to next page

TOTAL FUEL CONSUMPTION COST ( GIDGAMS ) FOR DIFFERENT FUEL

YEAR 1986

MONTH	TOTAL INDIVIDUAL FUEL CONSUMPTION COST				TOTAL
	NATURAL GAS	CRUISE OIL	GAS OIL	FUEL OIL	
JAN	16,535,093.47	3,488,020.94	654,470.40	WIL	20,677,584.81
FEB	20,148,322.40	1,145,832.00	528,394.30	42,302.00	21,864,850.90
MAR	23,820,374.52	459,254.82	272,444.40	107,233.75	24,669,309.69
APR	28,516,099.30	985,226.28	561,228.80	220,233.00	30,313,385.38
MAY	37,985,761.60	4,047,145.84	1,580,865.30	91,507.00	43,305,279.74
JUN	40,995,585.00	2,518,327.44	4,239,279.10	WIL	47,664,189.54
JUL	42,951,677.58	3,732,837.78	2,037,946.72	10,910.25	48,723,372.33
AUG	43,361,156.40	2,306,386.20	1,088,774.40	288,112.75	47,054,429.95
SEP	40,039,219.44	1,523,488.78	478,056.00	579,048.75	43,010,872.97
OCT	37,864,929.60	1,700,813.30	675,142.40	67,557.75	40,308,443.25
NOV	28,232,494.40	937,257.72	277,183.40	906,493.25	30,333,428.97
DEC	26,105,246.84	162,323.02	361,119.80	26,916.50	26,635,405.96
TOTAL	384,095,962.40	23,411,014.22	12,715,442.82	2,400,333.00	424,622,752
TOTAL			424,622,752		424,622,752

CALCULATION OF MANPOWER COST

1986

1. (a) HOUSING COST :-

GRADE	THREE BED	TWO BED
Special	90,000	50,000
1/1	75,000	45,000
1/2	65,000	40,000
2/1	50,000	35,000
2/2	40,000	30,000
2/3	35,000	30,000
2/4 or below	30,000	25,000

(b) NO. OF EMPLOYEES :-

GRADE	MARRIED		SINGLE
	3 CHILDREN OR MORE	2 CHILDREN OR LESS	
Special	13	17	1
1/1	2	1	-
1/2	5	1	-
2/1	7	5	-
2/2	23	27	1
2/3	31	43	3
2/4 OR BELOW	292	406	48

Total Housing Cost :- Dh 26,845,000

2. SALARY :-

Total Salary Per Month for 1833 Employees :- Dh 6,952,131  
 Total Annual Salary including Gratuity, Unused Leave etc. :- Dh 92,115,736  
 ( equivalent to 13.25 months salary )

3. AIR FARE :-

Air fare :- Dh 2,940,178

4. MISCELLANEOUS :-

Maintenance Contract, etc. :- Dh 24,539,220

5. TOTAL MANPOWER COST :-

Housing	:- Dh 26,845,000
Salary	:- Dh 92,115,736
Air fare	:- Dh 2,940,178
Miscellaneous	:- Dh 24,539,220
<b>Grand Total</b>	<b>:- Dh146,440,134</b>
No of Employees	:- 1833
Average Cost per employee per year	:- Dh 79,891

ALLOCATION OF MANPOWER BETWEEN WATER AND ELECTRICITY 1986  
 ( Final allocation including APS, UAN, Workshop and Central )

	ELECTRICITY	WATER	TOTAL
DPS	19	-	19
GTS	214	202	416
STS	201	161	362
UNE	126	160	286
UNW	286	239	525
9/10	49	-	49
EYS	118	-	118
SPS	27	-	27
SDS	-	31	31
TOTAL	1,040	793	1,833

1986 DEPRECIATION COST

STATION	CAPITAL COST APPORTIONED TO		TOTAL capital cost	DEPRECIATION		TOTAL DEPRECIATION
	ELECTRICITY	WATER		ELECTRICITY	WATER	
IGTS	294,738,361	153,270,734	448,009,095	33,458,527	16,893,663	50,352,190
ISTE	283,158,250	336,108,328	619,266,578	29,095,265	34,294,315	63,389,580
IUNE	206,357,878	362,658,319	569,016,197	28,283,270	36,998,900	65,282,170
IUNE	159,253,673		159,253,673	19,765,243	---	19,765,243
IUNM	821,172,570	694,978,964	1,516,151,534	83,727,903	70,795,042	154,522,945
IUN47/8	---	548,987,402	548,987,402	---	37,736,132	37,736,132
I9/10	399,167,529	---	399,167,529	41,285,824	---	41,285,824
I2P3	58,592,805	---	58,592,805	6,327,988	---	6,327,988
I2P8	32,129,444	---	32,129,444	3,552,384	---	3,552,384
I8YS	195,925,512	---	195,925,512	24,493,299	---	24,493,299
I8DS	---	7,550,000	7,550,000	---	792,786	792,786
TOTAL	12,458,046,022	2,096,003,747	14,554,049,769	269,989,703	1197,510,838	467,500,541



**STATISTICAL  
OPERATING DATA**

PEAK DEMAND REGISTERED ( MW )

1976 - 1986

	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986
ABU DHABI CITY	181.7	237.0	301.7	380.2	472.7	555.7	627.0	718.0	723.3 <sup>0</sup>	777.0	850.0
BANIYAS	2.9	6.1	12.8	19.0	21.5 <sup>0</sup>	-	-	-	-	-	-
SAADIYAT ISLAND	1.5	2.8	3.0	4.6	-	5.6	6.6	7.5	8.8 <sup>0</sup>	-	-
TOTAL OF ABU DHABI AREA	186.1	245.9	317.5	403.8	499.8	562.3	634.5	726.8	723.3	777.0	850.0
TOTAL OF AL AIN AREA	41.6	58.3	80.1	110.2	157.0	186.0	218.0	252.0	260.0	291.0	321.0
TOTAL ALL AREA	227.7 <sup>*</sup>	304.2 <sup>*</sup>	397.6	514.0 <sup>*</sup>	656.8	748.3	852.5 <sup>*</sup>	966.8 <sup>*</sup>	973.0	1063.0	1136.0
% INCREASE OVER PREVIOUS YEAR	38.6%	33.6%	30.7%	29.3%	27.8%	13.9%	13.9%	13.4%	0.7%	9.2%	6.9%

0 - From June 1981 onwards, and from August 1984 onwards is connected to Abu Dhabi Grid.  
 \* - Peak at Al Ain occurred in a different month.  
 + - AL AIN is interconnected to Abu Dhabi since April 1983.



## HISTORY OF PEAK POWER DEMAND

AL AIN, ABU DHABI AND COMBINED



1970 - 1986

## HISTORY OF MAXIMUM AND MINIMUM LOAD ( MW )

ABU DHABI

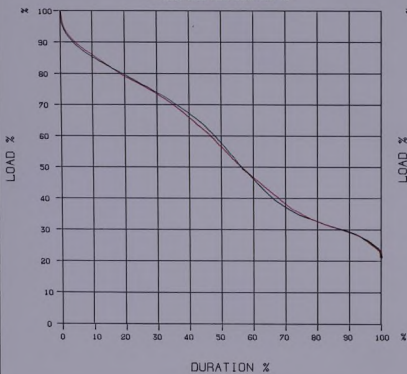
YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC	ANNUAL	% CHANGE
1970	Maximum 5.7	5.9	8.2	12.7	18.0	21.4	25.4	27.2	26.1	23.1	20.0	13.7	27.2	86.3%
	Minimum 2.2	2.4	2.5	2.1	2.4	5.9	6.1	77.7	4.2	77.7	5.5	5.6	2.1	-90.9%
1971	Maximum 12.4	15.4	15.4	23.1	31.0	32.4	36.1	38.0	38.2	32.0	24.7	20.0	38.2	40.4%
	Minimum 5.1	5.1	5.7	7.4	10.4	15.1	17.5	15.9	15.9	12.1	8.6	8.4	5.1	142.9%
1972	Maximum 16.8	16.8	20.0	28.8	40.4	47.8	51.1	53.0	51.8	48.8	38.4	24.4	53.0	38.7%
	Minimum 5.6	7.3	8.2	10.4	13.0	23.3	26.8	24.0	26.8	16.0	13.0	10.3	5.6	9.8%
1973	Maximum 21.4	22.8	31.3	51.0	58.8	62.5	70.0	74.8	72.0	69.2	46.2	30.4	72.0	45.3%
	Minimum 10.8	10.5	11.8	15.1	24.0	31.6	36.9	37.6	26.0	17.0	19.0	15.4	10.5	87.8%
1974	Maximum 29.8	30.4	42.1	58.9	78.9	88.2	97.4	99.4	104.8	102.6	63.2	44.8	104.8	36.1%
	Minimum 14.4	15.1	15.0	19.3	27.7	41.6	42.8	45.5	54.9	28.4	25.2	19.7	14.4	37.1%
1975	Maximum 38.8	38.5	49.2	76.2	109.7	121.8	130.9	137.4	134.9	126.9	78.8	56.8	137.4	31.1%
	Minimum 20.2	19.8	20.3	24.0	39.2	60.6	76.5	78.9	76.5	40.4	33.0	20.7	19.8	37.5%
1976	Maximum 49.4	49.5	57.9	100.3	150.2	164.2	172.5	181.7	177.9	159.4	120.9	69.4	181.7	32.2%
	Minimum 25.2	23.5	23.8	28.8	45.4	74.6	91.7	99.1	91.9	65.8	36.6	23.3	23.3	17.7%
1977	Maximum 68.0	66.5	123.0	157.9	204.7	220.1	237.0	235.4	234.8	215.1	188.8	106.4	237.0	30.4%
	Minimum 31.7	34.6	40.1	41.1	87.1	110.5	129.6	130.0	116.3	103.7	63.4	52.6	31.7	36.1%
1978	Maximum 91.4	88.0	138.0	205.7	236.7	273.2	288.0	301.7	274.8	260.6	198.3	135.9	301.7	27.3%
	Minimum 49.2	48.0	48.7	67.0	73.8	135.4	129.8	190.8	157.1	118.6	86.1	69.5	48.0	51.4%
1979	Maximum 113.1	133.0	163.3	254.0	332.0	366.2	380.2	376.8	352.5	334.5	254.6	157.7	380.2	26.0%
	Minimum 58.0	64.3	70.6	87.9	109.1	184.0	196.1	204.5	203.7	157.9	96.0	74.6	58.0	20.8%
1980	Maximum 133.6	149.0	250.0	336.3	391.2	415.6	472.7	461.3	432.2	415.4	292.0	204.0	472.7	24.3%
	Minimum 70.3	74.0	85.7	131.8	175.9	220.7	253.7	270.1	256.6	184.9	140.2	107.0	70.3	21.2%
1981	Maximum 197.5	188.5	268.0	405.0	485.0	502.0	552.7	551.0	530.0	491.0	334.0	267.5	552.7	17.6%
	Minimum 100.9	95.0	99.5	129.0	161.0	256.0	331.9	338.0	292.5	189.0	160.0	143.0	95.0	35.1%
1982	Maximum 221.0	218.0	271.0	414.0	557.0	592.0	604.0	627.0	605.0	539.0	400.0	277.0	627.0	12.6%
	Minimum 128.0	107.0	120.0	144.0	235.0	342.0	390.0	340.0	333.5	268.0	177.0	146.0	107.0	12.6%
1983	Maximum 245.0	241.0	261.0	421.0	624.0	647.0	688.0	718.0	681.0	639.0	420.0	319.0	718.0	14.5%
	Minimum 137.0	135.0	139.0	166.0	249.0	385.0	410.0	432.0	356.0	290.0	219.0	160.0	135.0	26.2%
1984	Maximum 274.0	278.0	435.0	553.0	629.0	657.0	723.3	710.0	672.0	666.0	434.0	366.0	723.3	0.7%
	Minimum 157.0	150.0	166.0	244.0	256.0	378.0	414.0	424.0	369.0	271.0	238.0	186.0	150.0	11.1%
1985	Maximum 292.0	303.0	470.0	568.0	701.0	709.0	756.0	777.0	744.0	728.0	507.0	369.0	777.0	8.2%
	Minimum 174.0	166.0	169.0	243.0	309.0	409.0	431.0	480.0	431.0	328.0	268.0	195.0	166.0	10.7%
1986	Maximum 317.0	331.0	427.0	574.0	786.0	814.0	824.0	820.0	783.0	740.0	582.0	395.0	820.0	9.4%
	Minimum 189.0	181.0	206.0	289.0	345.0	481.0	478.0	518.0	475.0	392.0	276.0	207.0	181.0	9.0%

## LOAD DURATION CURVE

GENERATION PLANNING & MANAGEMENT SERVICE  
WATER & ELECTRICITY DEPARTMENT  
ABU DHABI

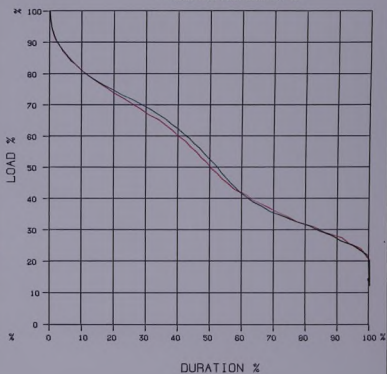
### FOR ABU DHABI SYSTEM

- \*YEAR 1985 PEAK LOAD 777 MW
- \*YEAR 1986 PEAK LOAD 850 MW



### FOR AL-AIN SYSTEM

- \*YEAR 1985 PEAK LOAD 291 MW
- \*YEAR 1986 PEAK LOAD 321 MW



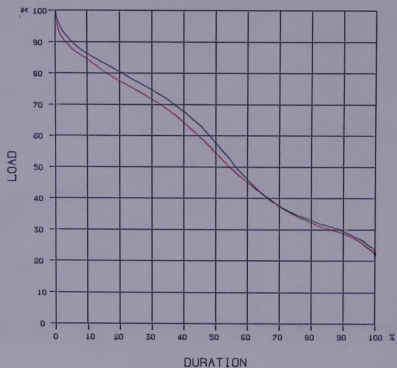
LOAD DURATION CURVE

GENERATION PLANNING & MANAGEMENT SERVICE  
WATER & ELECTRICITY DEPARTMENT  
ABU DHABI

### LOAD DURATION CURVE

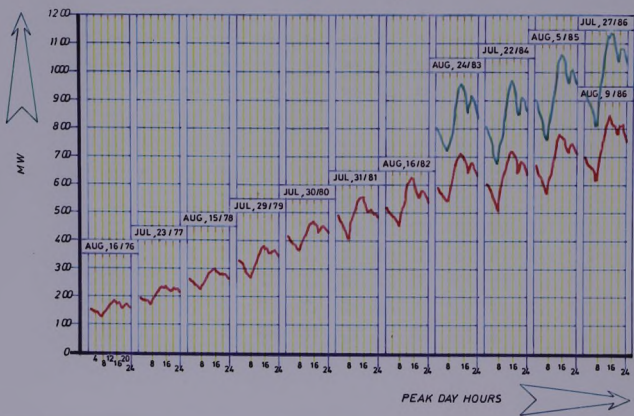
FOR THE TOTAL SYSTEM

- YEAR 1985 PEAK LOAD 1062MW  
- YEAR 1990 PEAK LOAD 1136MW



# DEMAND CURVE OF PEAK DEMAND DAY 1976-1986

ABU DHABI AND COMBINED



HISTORY OF MAXIMUM AND MINIMUM LOAD ( MW )

1974 - 1986

ALL YEAR

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC	ANNUAL	% CHANGE
1974 Maximum	5.7	6.1	7.3	10.3	11.6	14.0	15.9	<u>17.1</u>	16.8	15.6	8.0	7.9	17.1	
Minimum														
1975 Maximum	8.8	8.6	8.7	14.0	21.3	23.0	24.8	25.5	<u>24.9</u>	25.0	12.2	10.1	26.9	57.3%
Minimum														
1976 Maximum	11.8	11.5	11.6	18.5	27.0	37.6	39.4	38.2	41.6	32.3	21.9	18.0	41.6	54.4%
Minimum	3.0	4.0	4.8	4.5	6.0	10.0	11.0	12.5	<u>10.8</u>	7.6	5.5	7.0	3.0	
1977 Maximum	23.7	19.2	24.3	36.3	46.7	51.5	56.1	<u>58.3</u>	58.0	46.9	37.8	24.1	58.3	40.1%
Minimum	7.8	7.7	7.3	9.0	15.0	17.2	18.0	<u>24.0</u>	18.0	16.0	12.0	11.8	7.3	143.3%
1978 Maximum	24.9	24.8	37.4	55.2	65.2	72.4	71.6	<u>80.1</u>	79.1	64.0	39.5	32.5	80.1	37.4%
Minimum	10.0	10.2	11.2	15.6	14.0	23.0	17.0	<u>30.8</u>	26.4	20.5	15.6	14.2	10.0	37.0%
1979 Maximum	34.2	36.7	41.0	75.8	92.5	99.3	107.8	<u>110.2</u>	105.5	95.2	56.2	42.7	110.2	37.6%
Minimum	14.8	13.3	16.3	19.5	23.2	29.3	40.5	<u>44.1</u>	42.5	29.7	23.4	20.9	13.3	33.0%
1980 Maximum	42.9	45.3	91.0	108.2	125.0	134.8	<u>157.0</u>	145.8	141.0	128.1	84.0	64.5	157.0	42.5%
Minimum	17.5	21.0	23.3	29.7	35.3	52.3	<u>61.8</u>	65.0	55.0	37.5	32.9	25.4	17.5	31.6%
1981 Maximum	65.0	65.2	88.0	137.9	158.0	172.0	<u>186.0</u>	177.1	171.6	144.0	86.0	78.0	186.0	18.5%
Minimum	23.0	31.5	31.0	41.5	29.0	65.0	<u>87.0</u>	88.5	73.0	44.0	38.0	35.0	23.0	31.4%
1982 Maximum	80.0	75.0	100.5	158.0	191.0	207.0	<u>218.0</u>	207.0	197.0	183.0	122.0	92.0	218.0	17.5%
Minimum	34.0	36.0	36.5	42.0	68.0	99.0	<u>97.0</u>	100.0	87.5	76.0	41.0	40.0	34.0	47.0%
1983 Maximum	84.0	89.0	100.0	160.0	213.0	241.0	<u>243.0</u>	232.0	237.0	210.0	124.0	112.0	243.0	15.6%
Minimum	40.0	44.0	42.0	42.5	78.0	98.0	139.0	<u>133.0</u>	104.0	72.0	60.0	51.0	40.0	13.7%
1984 Maximum	100.0	104.0	174.0	218.0	247.0	255.0	<u>260.0</u>	256.0	241.0	200.0	129.0	110.0	260.0	3.2%
Minimum	52.0	52.0	90.0	80.0	90.0	129.0	<u>140.0</u>	130.0	110.0	82.0	46.0	40.0	40.0	0.0%
1985 Maximum	110.0	114.0	180.0	210.0	264.0	268.0	<u>280.0</u>	291.0	286.0	263.0	161.0	130.0	291.0	11.0%
Minimum	50.0	59.0	52.0	72.0	92.0	136.0	158.0	<u>151.0</u>	142.0	90.0	80.0	60.0	50.0	25.0%
1986 Maximum	129.0	128.0	170.0	229.0	<u>321.0</u>	315.0	319.0	314.0	292.0	276.0	180.0	142.0	321.0	10.3%
Minimum	60.0	61.0	66.0	86.0	<u>108.0</u>	172.0	170.0	140.0	158.0	132.0	82.0	62.0	60.0	20.5%

HISTORY OF MAXIMUM AND MINIMUM LOAD ( MW )

1980 - 1986

COMBINED

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC	ANNUAL	% CHANGE
1980 Maximum	176.5	194.3	241.0	444.5	516.2	550.4	629.7	607.1	573.2	543.5	376.0	268.5	629.7	
Minimum	87.8	95.0	109.0	161.5	210.8	273.0	335.5	335.1	311.6	222.4	173.1	132.4	87.8	
1981 Maximum	260.5	250.7	256.0	542.9	443.0	676.0	743.7	728.1	701.6	635.0	420.0	345.5	741.7	17.8%
Minimum	123.9	124.5	130.5	170.5	190.0	321.0	411.5	427.5	365.5	233.0	198.0	178.0	323.9	41.1%
1982 Maximum	301.0	293.0	371.5	572.0	748.0	799.0	822.0	836.0	806.0	722.0	522.0	349.0	836.0	12.4%
Minimum	162.0	143.0	156.5	186.0	301.0	441.0	487.0	460.0	421.0	344.0	218.0	186.0	343.0	13.0%
1983 Maximum	331.0	332.0	356.0	566.0	827.0	883.0	920.0	958.0	907.0	835.0	530.0	428.0	958.0	14.9%
Minimum	189.0	181.0	189.0	317.0	331.0	483.0	576.0	565.0	460.0	359.0	286.0	220.0	181.0	26.6%
1984 Maximum	372.0	380.0	607.0	758.0	864.0	906.0	973.3	962.0	900.0	800.0	550.0	475.0	973.3	1.6%
Minimum	217.0	212.0	218.0	322.0	346.0	505.0	559.0	554.0	478.0	363.0	300.0	242.0	212.0	17.1%
1985 Maximum	405.0	413.0	649.0	773.0	961.0	973.0	1028.0	1053.0	1007.0	962.0	663.0	465.0	1063.0	9.2%
Minimum	230.0	229.0	236.0	325.0	413.0	545.0	595.0	654.0	577.0	446.0	348.0	268.0	229.0	16.0%
1986 Maximum	442.0	451.0	597.0	795.0	1097.0	1122.0	1136.0	1126.0	1063.0	1008.0	762.0	529.0	1136.0	6.9%
Minimum	260.0	248.0	276.0	388.0	455.0	680.0	656.0	670.0	649.0	527.0	365.0	279.0	248.0	8.3%

\* - Excluding BYS upto 1980 and EPS upto 1983.

REU DUBAI AREA

YEAR	JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER	ANNUAL	% CHNG
1974	15,319	14,388	19,511	25,647	40,359	49,566	54,999	59,853	54,429	42,283	30,490	23,339	430,185	
1975	19,407	16,745	20,983	31,043	55,231	78,904	88,340	84,434	68,898	42,617	38,749	38,375	598,345	39.1
1976	23,531	22,877	26,455	40,237	75,093	90,195	101,039	114,160	107,344	89,374	48,978	36,585	778,048	30.0
1977	33,084	32,230	30,105	46,674	112,222	127,049	137,440	153,247	134,271	124,861	83,100	57,779	1,118,745	43.8
1978	45,675	45,018	41,284	111,268	181,339	149,423	175,791	187,449	163,005	142,183	94,172	69,609	1,349,066	22.4
1979	62,078	58,047	76,343	118,402	168,739	211,438	222,413	225,007	204,338	185,048	112,263	80,775	1,793,911	25.9
1980	73,487	74,708	108,417	163,183	211,423	243,490	289,447	285,384	260,318	239,700	147,438	109,893	2,195,606	27.4
1981	104,573	91,724	117,318	180,810	242,537	293,476	343,000	344,139	318,293	262,425	178,492	131,500	2,612,509	19.0
1982	125,682	105,891	130,399	192,811	308,609	346,783	385,089	374,922	343,801	297,442	184,242	142,562	2,947,785	12.8
1983	137,584	120,777	146,143	192,219	332,380	384,159	410,842	424,172	385,807	320,083	215,720	173,163	3,282,368	10.0
1984	159,766	143,222	196,526	280,859	345,381	386,717	441,283	431,050	392,895	320,125	223,704	185,920	3,589,927	8.9
1985	179,266	165,333	218,800	311,511	415,116	463,280	488,903	441,838	385,857	272,078	194,778	148,871	3,807,821	7.9
1986	180,602	171,439	211,825	292,226	434,787	466,566	500,815	502,147	460,473	421,886	287,230	209,150	4,139,056	8.7

HISTORY OF ELECTRICAL ENERGY DEMAND (MWH) 1974-1986

YEAR	JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER	ANNUAL	% CHNG
1974	15,319	14,388	19,511	25,647	40,359	49,566	54,999	59,853	54,429	42,283	30,490	23,339	430,185	
1975	19,407	16,745	20,983	31,043	55,231	78,904	88,340	84,434	68,898	42,617	38,749	38,375	598,345	39.1
1976	23,531	22,877	26,455	40,237	75,093	90,195	101,039	114,160	107,344	89,374	48,978	36,585	778,048	30.0
1977	33,084	32,230	30,105	46,674	112,222	127,049	137,440	153,247	134,271	124,861	83,100	57,779	1,118,745	43.8
1978	45,675	45,018	41,284	111,268	181,339	149,423	175,791	187,449	163,005	142,183	94,172	69,609	1,349,066	22.4
1979	62,078	58,047	76,343	118,402	168,739	211,438	222,413	225,007	204,338	185,048	112,263	80,775	1,793,911	25.9
1980	73,487	74,708	108,417	163,183	211,423	243,490	289,447	285,384	260,318	239,700	147,438	109,893	2,195,606	27.4
1981	104,573	91,724	117,318	180,810	242,537	293,476	343,000	344,139	318,293	262,425	178,492	131,500	2,612,509	19.0
1982	125,682	105,891	130,399	192,811	308,609	346,783	385,089	374,922	343,801	297,442	184,242	142,562	2,947,785	12.8
1983	137,584	120,777	146,143	192,219	332,380	384,159	410,842	424,172	385,807	320,083	215,720	173,163	3,282,368	10.0
1984	159,766	143,222	196,526	280,859	345,381	386,717	441,283	431,050	392,895	320,125	223,704	185,920	3,589,927	8.9
1985	179,266	165,333	218,800	311,511	415,116	463,280	488,903	441,838	385,857	272,078	194,778	148,871	3,807,821	7.9
1986	180,602	171,439	211,825	292,226	434,787	466,566	500,815	502,147	460,473	421,886	287,230	209,150	4,139,056	8.7

HISTORY OF ELECTRICITY DEMAND AS % OF PEAK MONTH DEMAND 1974-1986

YEAR	JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER	ANNUAL	% CHNG
1974	25.59	24.04	32.60	42.85	67.43	82.81	91.89	100.00	90.94	70.64	50.95	38.99		
1975	32.62	19.33	24.87	38.09	63.75	84.15	95.06	100.00	95.68	72.68	44.73	32.75		
1976	22.36	24.04	23.17	35.25	65.78	79.01	88.51	100.00	94.20	78.29	48.90	32.05		
1977	22.98	21.04	22.63	43.55	73.34	83.66	89.50	100.00	88.81	81.32	54.12	37.63		
1978	24.36	24.44	32.69	59.35	64.72	79.72	93.77	100.00	86.95	73.84	51.30	37.13		
1979	27.60	26.15	33.73	52.71	74.95	93.97	98.80	100.00	89.93	82.24	49.89	35.00		
1980	23.43	23.89	36.76	59.27	73.41	84.04	100.00	98.80	92.76	79.27	51.00	37.96		
1981	30.29	26.65	34.09	52.54	70.48	82.38	99.67	100.00	90.73	76.31	51.87	44.02		
1982	32.79	27.48	34.04	50.33	60.68	90.52	100.00	98.29	89.74	80.23	48.13	37.21		
1983	22.43	24.43	24.48	45.32	78.34	90.57	96.86	100.00	90.81	75.48	50.86	40.88		
1984	28.19	28.92	44.95	63.61	77.18	86.23	100.00	97.63	88.99	74.77	52.93	42.11		
1985	34.56	30.15	41.64	53.29	79.00	85.96	95.94	100.00	90.37	79.90	56.34	40.33		
1986	35.97	34.22	42.07	58.22	86.59	92.91	99.73	100.00	91.70	84.01	57.20	41.63		



AL AIN

HISTORY OF ELECTRICAL ENERGY DEMAND 1974-1986

YEAR	JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER	ANNUAL	LOADING
1974	2,460	2,215	2,945	3,893	5,570	6,550	7,632	8,780	8,106	5,343	3,490	3,546	60,530	
1975	3,817	3,147	3,413	4,976	9,052	10,789	13,237	13,185	12,830	8,003	4,787	4,659	91,825	51.7
1976	4,923	4,529	4,707	6,198	12,598	16,481	18,946	19,770	19,204	14,116	8,740	8,251	138,083	51.2
1977	9,279	8,765	9,437	13,429	22,000	24,174	28,155	31,366	27,829	22,375	13,842	12,139	222,790	60.4
1978	11,453	10,305	13,271	20,768	27,498	35,025	38,577	43,715	36,461	28,960	18,690	15,747	300,880	36.0
1979	16,247	15,389	18,525	30,268	43,197	52,930	58,192	61,657	53,791	45,308	26,567	23,080	446,151	48.3
1980	22,959	21,734	30,322	47,015	60,334	71,048	85,696	82,854	73,333	57,941	38,733	31,070	623,061	39.7
1981	31,261	31,450	37,181	61,921	74,462	85,149	107,677	102,527	91,880	74,681	42,732	39,068	782,005	25.5
1982	41,260	34,289	44,745	64,208	100,457	113,585	123,381	121,611	108,734	93,004	52,823	46,100	944,197	20.7
1983	49,305	46,898	50,082	62,540	110,371	129,256	150,196	148,302	128,509	94,177	62,691	56,068	1,096,413	16.1
1984	54,995	51,812	73,093	101,920	123,943	137,264	153,761	144,105	128,775	101,358	68,052	59,465	1,197,635	9.2
1985	59,421	54,923	76,156	89,244	134,209	145,599	163,461	164,981	150,274	127,986	81,248	68,436	1,316,038	9.9
1986	65,568	57,541	76,080	107,565	171,763	174,147	185,014	180,117	163,923	143,463	90,449	71,173	1,485,783	12.9

AL AIN

HISTORY OF ELECTRICITY DEMAND AS A % OF PEAK MONTH DEMAND 1974-1986

YEAR	JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER
1974	26.02	25.23	33.54	44.34	63.44	74.60	86.92	100.00	92.32	60.85	39.75	40.39
1975	28.84	23.77	25.78	37.59	68.38	81.05	100.00	99.46	96.93	60.69	38.01	35.20
1976	24.90	22.91	23.81	31.35	63.72	85.39	95.93	100.00	97.14	71.40	44.23	41.73
1977	29.58	27.84	30.72	42.81	70.14	77.07	89.76	100.00	88.09	71.34	44.13	38.70
1978	26.66	23.57	30.36	47.40	63.36	77.07	88.25	100.00	83.43	66.25	42.75	36.02
1979	26.35	24.86	35.38	54.86	70.40	80.32	88.25	100.00	85.49	85.57	67.61	45.24
1980	26.79	25.34	30.05	49.09	70.06	87.47	94.38	100.00	87.24	73.48	43.09	37.43
1981	30.89	29.21	34.53	57.51	69.15	79.10	100.00	95.22	85.33	69.36	39.69	36.28
1982	33.44	27.78	36.27	52.04	81.42	92.06	100.00	98.57	88.13	75.38	42.81	37.36
1983	32.83	29.89	33.34	41.65	73.48	92.72	100.00	98.74	85.56	62.70	43.74	37.33
1984	35.77	33.70	47.54	66.29	80.03	89.28	100.00	93.73	83.76	65.92	44.26	38.68
1985	36.02	33.29	46.16	64.09	81.43	88.25	99.08	100.00	91.09	77.58	49.25	41.48
1986	35.44	31.10	40.58	58.14	92.84	94.13	100.00	97.35	88.60	77.53	48.89	38.47
AVG	30.42	27.59	34.47	49.02	72.91	84.93	96.49	98.44	89.70	69.24	43.22	38.10
AVG	34.70	31.15	40.78	54.44	81.84	91.29	99.82	97.68	87.43	71.82	45.39	38.66

COMBINED ELECTRICAL ENERGY DEMAND 1974-1986  
ABU DHABI & AL AIN

YEAR	JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER	ANNUAL	ACHRG
1974	17.779	16.603	22.455	29.540	45.929	56.116	62.631	68.633	62.535	47.626	33.983	26.885	490.715	
1975	23.424	19.892	24.396	36.239	64.283	83.633	95.597	99.801	95.722	70.450	43.516	33.034	690.187	40.6
1976	30.454	27.406	31.162	46.435	87.691	107.076	120.005	133.930	156.748	103.490	57.718	44.836	916.951	32.9
1977	44.562	41.095	59.742	80.305	135.223	152.023	165.575	184.913	164.000	147.236	96.942	69.938	1,341.535	46.3
1978	57.328	56.123	74.555	132.026	149.037	184.478	224.368	231.184	199.466	171.143	114.862	85.356	1,669.926	24.5
1979	78.345	74.236	94.888	148.870	211.936	265.368	280.605	286.464	256.123	230.356	138.830	103.855	2,270.062	29.9
1980	94.586	86.473	136.739	210.198	271.987	314.338	375.183	368.260	393.645	287.699	186.411	140.968	2,818.667	29.9
1981	137.834	123.176	154.499	242.731	316.999	368.665	450.677	446.666	404.374	337.306	221.224	190.564	3,394.515	20.4
1982	168.882	139.580	175.144	257.019	409.156	460.370	506.470	498.533	452.535	400.446	237.185	188.642	3,891.982	14.7
1983	186.869	165.675	186.345	254.778	482.781	523.415	561.058	572.474	513.716	414.260	278.411	229.229	4,238.982	11.5
1984	216.762	197.164	271.545	382.778	472.623	517.982	595.275	575.155	521.671	431.483	301.758	245.385	4,727.561	9.0
1985	246.291	200.705	277.234	346.584	515.820	560.716	626.741	647.884	591.502	513.843	353.323	263.214	5,121.859	8.4
1986	246.169	229.379	284.335	399.892	606.551	640.713	685.829	682.064	624.405	545.309	377.679	280.323	5,624.848	9.8

HISTORY OF MONTHLY ELECTRICITY DEMAND AS % OF PEAK MONTH DEMAND 1974-1986

YEAR	JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER
1974	25.90	24.19	32.72	43.04	66.92	81.76	91.25	100.00	91.12	69.39	49.51	39.17
1975	23.47	19.93	24.64	36.33	64.43	83.80	95.79	100.00	95.91	70.79	43.60	33.10
1976	22.76	20.46	23.27	34.67	65.48	79.95	89.60	100.00	94.64	72.27	43.10	33.48
1977	24.10	22.22	32.31	43.43	73.13	82.21	89.54	100.00	88.69	79.62	52.43	37.81
1978	24.80	24.28	32.25	57.11	64.47	79.80	92.73	100.00	86.28	74.03	49.68	36.92
1979	27.33	25.90	33.69	51.93	73.93	92.57	97.89	100.00	89.35	80.36	48.43	36.23
1980	25.74	25.77	36.45	56.03	72.49	83.78	100.00	98.15	88.93	76.68	49.69	37.57
1981	30.58	27.33	34.28	53.86	70.34	81.80	100.00	99.11	89.68	74.84	49.09	42.28
1982	32.95	27.56	34.68	50.75	80.79	90.90	100.00	98.43	89.35	78.07	46.83	37.25
1983	32.64	28.94	34.30	44.50	72.34	91.43	98.01	100.00	89.74	72.36	48.63	40.04
1984	36.08	31.12	45.62	64.10	79.40	87.02	100.00	96.62	87.44	72.48	50.69	41.22
1985	34.93	30.98	42.79	53.49	79.62	86.55	94.74	100.00	91.30	79.31	54.53	40.63
1986	35.89	33.45	41.75	58.31	88.44	93.42	100.00	99.48	91.04	82.43	55.07	40.87
AVERG	29.01	26.47	34.45	49.83	73.60	85.77	96.27	99.37	90.28	76.05	49.33	38.20
AVERG	34.50	30.81	39.81	54.27	81.12	89.86	98.95	99.91	89.81	77.13	51.15	40.00

## HISTORY OF ELECTRICAL ENERGY DEMAND GWH (1976-1986)

AL AIN, ABU DHABI AND COMBINED



MONTHLY STATIONWISE POWER GENERATION ( kWh )

1986

MONTH	DIESEL	GAS		STEAM		UMM-AL-NAR		UMM-AL-NAR		9 & 10	BANYAS	SADIYAT	TOTAL			TOTAL	MONTH
		TURBINE	TURBINE	TURBINE	TURBINE	EAST	WEST	5	6				ABU DHABI	AL - AIN	ABU DHABI-AL AIN		
JAN	14,000	20,909,000	13,259,850	50,308,650	96,920,400	22,333,000	17,271,000	18,000	221,033,900	25,135,570	246,169,470	JAN					
FEB	299,000	30,994,000	34,993,000	25,269,300	76,784,800	25,782,000	22,457,000	195,500	216,774,600	12,604,550	229,379,150	FEB					
MAR	29,000	24,573,000	40,459,550	46,410,525	81,865,600	64,175,000	19,828,000	18,000	277,358,675	8,976,290	286,334,965	MAR					
APR	23,000	50,158,000	43,442,100	43,058,625	135,747,400	61,652,000	38,902,000	39,000	373,022,125	26,869,380	399,891,505	APR					
MAY	847,000	49,333,000	44,465,050	73,345,200	183,484,000	81,950,000	45,492,000	95,000	529,011,250	77,539,430	606,550,680	MAY					
JUN	318,000	95,893,000	51,891,750	100,343,550	203,834,800	78,044,000	59,441,000	48,000	590,814,100	49,899,030	640,713,130	JUN					
JUL	133,000	104,663,000	72,669,650	139,588,050	196,189,800	61,265,000	54,746,000	112,000	629,346,300	56,462,160	685,828,460	JUL					
AUG	26,000	82,896,000	82,793,000	150,621,200	205,749,200	65,255,000	54,222,000	105,000	641,667,400	40,596,500	682,263,900	AUG					
SEP	20,000	81,557,000	66,507,100	131,486,250	171,292,400	84,997,000	50,973,000	105,000	586,937,750	37,467,000	624,404,750	SEP					
OCT	30,000	56,501,000	73,296,250	129,034,050	142,589,200	86,316,000	43,474,000	105,000	531,345,500	33,963,140	565,308,640	OCT					
NOV	18,000	42,906,000	50,124,950	95,970,750	105,812,775	42,384,000	26,618,000	73,500	363,909,975	13,768,560	377,678,535	NOV					
DEC	19,000	29,633,000	34,064,200	87,558,300	80,157,400	20,314,000	23,553,000	137,000	275,437,900	4,884,860	280,322,760	DEC					
TOTAL	1,276,000	170,016,000	160,970,450	1,072,994,450	1,680,427,775	1,695,467,000	1,456,977,000	1,051,000	5,236,679,675	1,388,166,470	6,624,846,145	TOTAL					
% OF												% OF					
TOTAL	00.03	12.80	10.81	19.08	29.88	12.36	8.12	00.02	93.10	6.90	100.00	TOTAL					
BY GEN												BY GEN					

MONTHLY AUXILIARY POWER CONSUMPTION ( kWh )

ABU DHABI & AL AIN POWER STATIONS

1988

MONTH	DPS	QTS	STS	UNE	UNW	9 & 10	BYS	SPS	TOTAL		TOTAL GRID	
									A.D.P.S	AL AIN	(A.D.P.S/AL AIN)	MONTH
JAN	7,900	1,687,000	10,155,955	4,558,203	16,174,095	2,035,000	291,189	840	34,952,982	2,010,844	36,963,826	JAN
FEB	14,900	1,434,100	8,951,130	2,170,415	15,233,895	2,187,000	332,225	5,865	30,589,530	1,008,344	31,597,874	FEB
MAR	5,400	1,873,200	9,232,558	4,619,337	15,146,415	4,608,000	331,948	540	35,817,678	718,103	36,535,781	MAR
APR	19,700	1,910,800	9,734,200	3,664,537	16,353,400	4,101,000	515,228	1,170	36,806,135	2,149,550	39,055,685	APR
MAY	29,800	3,427,300	10,435,270	3,840,675	18,357,415	5,111,000	591,240	2,850	42,435,870	4,203,154	46,639,024	MAY
JUN	13,100	3,749,600	11,146,255	5,051,880	17,250,160	5,010,000	676,190	1,440	42,822,565	3,991,922	46,814,487	JUN
JUL	14,100	3,749,600	12,004,818	5,594,460	17,245,870	4,236,000	672,080	3,760	43,591,298	4,516,973	48,098,271	JUL
AUG	12,200	3,157,900	13,111,095	5,169,213	18,392,170	4,263,000	648,530	3,150	45,457,298	3,247,720	48,704,978	AUG
SEP	8,200	2,662,004	12,078,205	3,815,498	22,785,500	5,215,000	583,863	3,150	47,164,074	2,397,360	50,163,434	SEP
OCT	6,900	2,073,500	12,483,515	4,405,338	15,855,814	5,242,000	552,965	3,150	41,007,592	2,717,051	43,724,633	OCT
NOV	9,700	2,232,200	11,050,712	4,235,789	11,237,975	3,426,000	393,430	2,205	32,092,031	1,101,485	34,193,496	NOV
DEC	6,700	2,068,800	9,076,420	3,520,398	11,175,475	3,426,000	348,220	4,110	35,676,430	390,789	36,017,219	DEC
TOTAL	143,800	30,230,904	130,044,447	50,656,701	203,328,284	49,048,000	5,951,250	31,530	469,455,413	31,053,317	500,508,730	TOTAL
% OFF												% OFF
TOTAL	8.1	4.2	21.4	4.7	12.1	7.1	1.3	3.0	9.0	8.0	8.9	TOTAL
T.OBS								(assumed)		( assumed )		T.OBS
TOTAL												TOTAL
ENERGI	1,774,000	170,016,000	1,607,970,450	1,072,994,450	1,480,427,775	1,695,467,000	145,977,000	1,051,000	15,236,679,675	388,166,470	16,624,846,145	ENERGI
% OFF												% OFF

MONTHLY STATIONWISE WATER PRODUCTION AND WATER SUPPLY ( Million Gallons )

1956

MONTH	WATER PRODUCTION							WATER SUPPLY					MONTH
	GS	HS	USE	UM	US	SD	TOTAL	(GS + HS)	(USE + UM + US)	SD	TOTAL		
JAN	34.91	304.74	475.45	732.99	0.56	1.32	1,559.79	356.47	1,162.98	1.32	1,500.17	JAN	
FEB	42.75	264.56	223.00	829.99	0.46	0.96	1,361.72	282.16	1,016.62	0.96	1,299.74	FEB	
MAR	43.10	261.97	453.27	780.18	0.71	1.10	1,540.53	308.31	1,210.39	1.38	1,519.88	MAR	
APR	30.53	265.08	329.54	878.06	0.43	1.32	1,504.96	300.28	1,176.87	1.27	1,478.42	APR	
MAY	67.14	298.56	325.05	1,021.33	0.78	1.45	1,714.31	365.70	1,321.15	1.65	1,688.50	MAY	
JUN	72.90	298.00	443.17	932.15	0.60	1.66	1,738.48	356.36	1,325.57	1.44	1,683.37	JUN	
JUL	78.62	291.97	458.95	1,034.35	0.55	1.24	1,865.70	368.51	1,454.02	1.38	1,823.91	JUL	
AUG	74.38	322.73	423.25	1,071.51	0.74	1.48	1,894.09	399.53	1,479.63	1.50	1,876.46	AUG	
SEP	60.34	299.62	302.40	1,099.85	0.46	1.31	1,763.98	363.01	1,386.07	1.33	1,750.41	SEP	
OCT	48.95	360.24	360.81	1,097.55	0.80	1.60	1,860.95	395.07	1,434.30	1.51	1,831.08	OCT	
NOV	54.78	306.70	348.90	1,105.27	0.48	1.52	1,817.55	364.43	1,367.30	1.45	1,733.18	NOV	
DEC	61.19	269.47	322.02	1,124.44	0.34	1.27	1,778.73	329.32	1,429.15	1.47	1,755.94	DEC	
TOTAL	659.19	3,533.64	4,465.99	11,687.68	6.92	16.24	20,379.66	4,160.95	15,763.85	16.26	19,941.06	TOTAL	
% OF												% OF	
TOTAL	3.28	17.34	21.91	57.95	00.03	00.08	100.00	20.87	79.05	00.08	100.00	TOTAL	

MONTHLY EXPORT AND IMPORT TO/FROM AL AIN

1985-1986

MONTH	ENERGY						WATER	
	1985			1986			1985	1986
	Export to Al Ain Kwh	Import from Al Ain Kwh	Net export to Al Ain Kwh	Export to Al Ain Kwh	Import from Al Ain Kwh	Net export to Al Ain Kwh	Export to Al Ain MG	Import to Al Ain MG
JAN	32,904,000	4,000	32,900,000	40,432,000	WIL	40,432,000	51.0	159.00
FEB	32,156,000	WIL	32,156,000	45,120,000	184,000	44,936,000	34.0	134.00
MAR	40,288,000	WIL	40,288,000	66,104,000	WIL	66,104,000	31.0	110.00
APR	46,192,000	32,000	46,160,000	80,496,000	WIL	80,496,000	22.4	84.00
MAY	87,376,000	20,000	87,356,000	94,272,000	48,000	94,224,000	33.0	124.00
JUN	89,960,000	WIL	89,960,000	124,248,000	WIL	124,248,000	32.0	159.50
JUL	111,888,000	WIL	111,888,000	128,552,000	WIL	128,552,000	27.9	219.50
AUG	93,640,000	WIL	93,640,000	139,520,000	WIL	139,520,000	36.0	219.79
SEP	97,368,000	WIL	97,368,000	126,456,000	WIL	126,456,000	77.2	194.00
OCT	99,584,000	WIL	99,584,000	109,480,000	WIL	109,480,000	63.0	218.84
NOV	75,224,000	WIL	75,224,000	76,480,000	WIL	76,480,000	79.0	207.30
DEC	47,520,000	WIL	47,520,000	66,288,000	WIL	66,288,000	117.0	258.84
TOTAL	854,100,000	56,000	854,044,000	1,097,848,000	232,000	1,097,616,000	403.50	2,088.79

HISTORY OF WATER PRODUCTION IN MILLION GALLONS 1973-1986

ABU DHABI - DESALINATION PLANTS

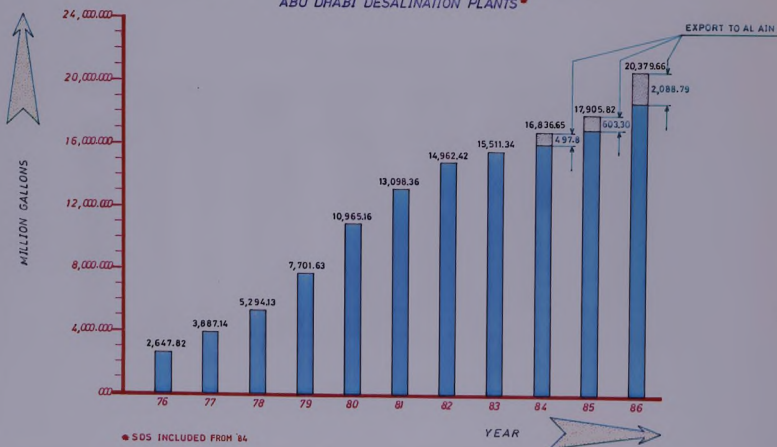
YEAR	JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER	ANNUAL	% CHANGE
1973	95.0	77.0	80.9	102.0	136.4	144.05	155.33	152.29	145.49	149.20	148.31	152.27	1,536.32	-
1974	133.66	124.25	150.6	148.74	169.86	162.44	178.51	188.89	161.19	164.56	154.47	171.45	1,908.62	24.2%
1975	155.21	159.14	156.92	151.24	156.23	194.82	187.59	193.35	187.94	180.94	178.49	178.47	2,098.14	7.8%
1976	197.49	188.14	206.53	203.24	235.65	248.94	262.25	245.57	230.81	225.32	203.61	200.25	2,647.82	28.7%
1977	232.18	230.87	262.51	289.82	320.34	329.71	360.20	370.15	347.09	381.20	385.73	377.34	3,887.14	46.8%
1978	346.51	329.18	383.64	386.36	408.94	442.60	505.47	495.85	477.14	504.87	495.34	518.24	5,294.13	36.2%
1979	503.58	465.72	568.52	561.36	575.56	556.33	733.59	752.48	742.43	746.03	731.44	764.61	7,701.63	45.5%
1980	758.05	720.12	748.68	812.21	954.41	957.01	999.30	1,089.25	1,021.43	1,004.40	943.94	956.36	10,965.16	42.4%
1981	955.92	864.29	959.69	1,111.34	1,060.44	1,087.97	1,150.60	1,191.73	1,153.80	1,206.14	1,174.92	1,181.52	13,098.36	19.5%
1982	1,185.80	1,053.23	1,115.30	1,207.25	1,298.88	1,293.24	1,369.80	1,356.79	1,300.12	1,276.82	1,293.97	1,251.22	14,962.42	14.2%
1983	1,204.36	1,079.56	1,210.84	1,172.42	1,314.62	1,307.92	1,394.85	1,425.69	1,378.04	1,380.47	1,313.86	1,328.75	15,511.34	3.7%
1984*	1,354.29	1,243.50	1,328.19	1,351.54	1,435.01	1,456.40	1,462.87	1,557.31	1,415.35	1,456.09	1,399.91	1,376.19	16,836.65	8.5%
1985	1,371.13	1,253.89	1,426.99	1,386.97	1,543.11	1,526.28	1,578.29	1,607.41	1,571.68	1,610.22	1,502.64	1,527.21	17,906.82	6.4%
1986	1,529.75	1,361.72	1,540.33	1,504.96	1,714.51	1,738.48	1,865.70	1,894.09	1,763.98	1,869.95	1,817.65	1,778.73	20,379.66	13.8%

\* Saudiyat is included from 1984



## HISTORY OF WATER PRODUCTION

ABU DHABI DESALINATION PLANTS



1986 LOAD ANALYSIS ABU DHABI

MONTH	MAX	MIN	T. ENERGY	MONTHLY	MONTHLY	MONTHLY MIN	MONTHLY MIN
	L'D	L'D	DEMAND	L'D	P'K.L'D	L'D AS %	L'D AS %
	M.W	M.W	G.W.H	FACTOR	OF MAX.	OF MNTH.PK	OF YR.PK
JAN	317	189	180.602	76.6%	37.3%	59.6%	22.2%
FEB	331	181	171.839	77.3%	38.9%	54.7%	21.3%
MAR	427	206	211.255	66.5%	50.2%	48.2%	24.2%
APR	574	288	292.336	70.7%	67.5%	50.2%	33.9%
MAY	786	345	434.787	74.4%	92.5%	43.9%	40.6%
JUN	814	491	466.566	79.6%	95.8%	60.3%	57.8%
JUL	824	476	500.815	81.7%	96.9%	57.8%	56.0%
AUG	850	516	502.147	79.4%	100.0%	60.7%	60.7%
SEP	783	475	460.473	81.7%	92.1%	60.7%	55.9%
OCT	740	392	421.866	76.6%	87.1%	53.0%	46.1%
NOV	582	276	287.230	68.5%	68.5%	47.4%	32.5%
DEC	395	207	209.150	71.2%	46.5%	52.4%	24.4%
ANN:	850	181	4,139.066	55.6%			

1986 LOAD ANALYSIS AL AIN

MONTH	MAX	MIN	T.ENERGY	MONTHLY	MONTHLY	MONTHLY MIN	MONTHLY MIN
	L'D	L'D	DEMAND	L'D	P'K.L'D	L'D AS %	L'D AS %
	M.W	M.W	G.W.H	FACTOR	OF MAX.	OF MNTH.PK	OF YR.Pk
JAN	129	60	65.568	68.3%	40.2%	46.5%	18.7%
FEB	128	61	57.541	66.9%	39.9%	47.7%	19.0%
MAR	170	66	75.080	59.4%	53.0%	38.8%	20.6%
APR	229	86	107.565	65.2%	71.3%	37.6%	26.8%
MAY	321	108	171.763	71.9%	100.0%	33.6%	33.6%
JUN	315	172	174.147	76.8%	98.1%	54.6%	53.6%
JUL	319	170	185.014	78.0%	99.4%	53.3%	53.0%
AUG	314	140	180.117	77.1%	97.8%	44.6%	43.6%
SEP	292	158	163.923	78.0%	91.0%	54.1%	49.2%
OCT	276	132	143.443	69.9%	86.0%	47.8%	41.1%
NOV	180	82	90.449	69.8%	56.1%	45.6%	25.3%
DEC	142	62	71.173	67.4%	44.2%	43.7%	19.3%
ANN:	321	60	1,485.783	52.8%			

## 1986 LOAD ANALYSIS COMBINED

MONTH	MAX L'D M.W	MIN L'D M.W	T.ENERGY DEMAND G.W.H	MONTHLY L'D FACTOR	MONTHLY P'K.L'D OF MAX.	MONTHLY MIN L'D AS % OF MNTH.PK	MONTHLY MIN L'D AS % OF YR.PK
JAN	442	260	246.169	74.9%	38.9%	58.8%	22.9%
FEB	451	248	229.379	75.7%	39.7%	55.0%	21.8%
MAR	597	276	286.335	64.5%	52.6%	46.2%	24.3%
APR	795	388	399.892	69.9%	70.0%	48.8%	34.2%
MAY	1,097	455	606.551	74.3%	96.6%	41.5%	40.1%
JUN	1,122	680	640.713	79.3%	98.8%	60.6%	59.9%
JUL	1,136	656	685.829	81.1%	100.0%	57.7%	57.0%
AUG	1,124	670	682.264	81.6%	98.9%	59.6%	59.0%
SEP	1,063	649	624.405	81.6%	93.6%	61.1%	57.1%
OCT	1,008	527	565.309	75.4%	88.7%	52.3%	46.4%
NOV	762	365	377.679	68.8%	67.1%	47.9%	32.1%
DEC	529	279	280.323	71.2%	46.6%	52.7%	24.6%
ANN:	1,136	248	5,624.848	56.5%			

COMBINED SYSTEM LOAD PATTERN INDICATORS

Y	Rated Output (Nameplate)	Peak Demand	Annual Generation	Average Annual Demand	Annual Load Factor	Annual Utilization Factor	Capacity Factor
A	MW	MW	kwh x 10 <sup>6</sup>	c/hr/yr	d/b	b/a	d/a or e x f
R	( a )	( b )	( c )	( d )	( e )	( f )	( g )
1974	206.1	121.9	490.7	56.02	0.460	0.591	0.272
1975	266.2	164.3	690.2	78.79	0.480	0.617	0.296
1976	362.5	227.7	917.0	104.39	0.458	0.628	0.288
1977	544.1	304.2	1,341.5	153.14	0.503	0.559	0.281
1978	726.6	397.6	1,669.9	190.63	0.479	0.547	0.262
1979	881.6	514.0	2,170.1	247.73	0.482	0.583	0.281
1980	1,101.8	656.8	2,818.7	320.89	0.489	0.596	0.291
1981	1,207.6	748.3	3,394.5	387.50	0.518	0.620	0.321
1982	1,207.6	852.5	3,892.0	444.29	0.521	0.706	0.368
1983	1,345.6	966.8	4,339.0	495.32	0.512	0.718	0.368
1984	1,656.0	973.0	4,727.6	538.21	0.553	0.588	0.325
1985	1,635.0	1,063.0	5,123.9	584.92	0.550	0.650	0.358
1986	1,795.0	1,136.0	5,624.8	642.10	0.565	0.633	0.358

Note Annual Load Factor =  $\frac{\text{average load over the year}}{\text{Peak load of the year}}$

Utilization Factor =  $\frac{\text{peak load for the period}}{\text{rated capacity of the plant}}$

Capacity Factor =  $\frac{\text{average load for the period}}{\text{rated capacity of the plant}}$

HISTORY OF MONTHLY PEAK LOAD AS PERCENTAGE OF  
YEARLY PEAK LOAD 1980 -1986  
ABU DHABI

MONTH	1980	1981	1982	1983	1984	1985	1986	AVRG
JAN	28.3	35.5	35.2	34.1	37.9	38.4	37.3	35.2
FEB	31.5	33.4	34.8	33.6	38.5	39.0	38.9	35.7
MAR	52.9	48.2	43.2	36.4	60.2	60.5	50.2	50.2
APR	71.1	72.9	66.0	58.6	76.5	73.1	67.5	69.4
MAY	82.8	87.3	88.0	86.9	87.0	90.2	92.5	87.9
JUN	87.9	90.3	94.4	90.1	90.9	90.7	95.8	91.4
JUL	100.0	100.0	96.3	95.8	100.0	97.3	96.9	98.0
AUG	97.6	99.2	100.0	100.0	98.2	100.0	100.0	99.3
SEP	91.4	95.4	97.1	94.9	92.9	95.8	92.1	94.2
OCT	87.4	86.4	86.0	88.4	83.8	93.7	87.1	87.9
NOV	61.8	60.1	63.8	58.5	60.6	65.3	68.5	62.7
DEC	43.2	40.1	44.2	44.4	59.6	47.5	46.5	46.4

HISTORY OF MONTHLY PEAK LOAD AS PERCENTAGE OF  
YEARLY PEAK LOAD 1980 -1986  
AL AIN

MONTH	1980	1981	1982	1983	1984	1985	1986	AVRG
JAN	27.3	33.9	36.7	37.3	38.5	37.8	40.2	36.0
FEB	28.9	35.1	34.4	36.9	40.0	39.2	39.9	36.3
MAR	58.0	47.3	46.1	39.7	66.9	61.9	53.0	53.3
APR	68.9	74.1	72.5	63.5	83.8	72.2	71.3	72.3
MAY	79.6	85.0	87.6	84.5	95.0	90.7	100.0	88.9
JUN	85.9	90.5	95.0	95.6	98.1	92.1	98.1	93.9
JUL	100.0	100.0	100.0	96.4	100.0	96.2	89.4	98.9
AUG	92.9	95.2	93.0	100.0	98.5	100.0	97.8	97.1
SEP	90.9	90.3	90.4	94.0	92.7	98.3	91.0	93.9
OCT	81.6	77.4	84.0	83.3	78.9	90.4	86.0	82.8
NOV	53.5	46.2	56.0	49.2	49.6	55.3	56.1	52.3
DEC	41.1	41.9	42.2	44.4	42.3	44.7	44.2	43.0

HISTORY OF MONTHLY PEAK LOAD AS PERCENTAGE OF  
YEARLY PEAK LOAD 1982 -1986  
COMBINED

MONTH	1982	1983	1984	1985	1986	AVRG
JAN	36.1	34.6	38.2	38.1	38.9	37.2
FEB	35.1	34.7	39.1	38.9	39.7	37.5
MAR	44.5	37.2	62.4	61.1	52.6	51.6
APR	68.6	69.1	77.9	72.7	70.0	69.7
MAY	89.7	86.3	88.8	90.4	96.6	90.4
JUN	95.8	92.2	93.1	91.5	98.8	94.3
JUL	98.6	96.0	100.0	96.7	100.0	98.3
AUG	100.0	100.0	98.9	100.0	98.9	99.4
SEP	96.6	94.7	92.5	94.7	93.6	94.4
OCT	86.6	87.2	82.2	90.5	88.7	87.0
NOV	62.6	55.3	56.5	62.4	67.1	60.8
DEC	44.2	44.7	48.8	46.6	46.6	46.2

HISTORY OF MONTHLY LADD FACTOR 1980 - 1986  
A B U D H A B I

MONTH	1980	1981	1982	1983	1984	1985	1986	AVRG
JAN	74.1	71.2	76.4	75.3	77.0	75.3	76.6	75.2
FEB	72.3	73.6	71.9	74.6	73.7	71.6	77.3	73.6
MAR	57.2	58.8	64.7	75.3	60.3	57.7	66.5	62.9
APR	67.4	62.0	64.7	63.4	69.6	62.9	70.7	65.8
MAY	72.7	67.2	74.5	71.6	73.8	73.1	74.4	72.5
JUN	81.3	78.4	81.4	82.5	79.6	81.8	79.6	80.7
JUL	82.3	83.0	85.2	80.3	81.4	82.4	81.7	82.3
AUG	83.2	83.9	80.8	79.4	81.6	83.5	79.4	81.7
SEP	83.7	81.8	78.4	78.6	81.2	82.4	81.7	81.1
OCT	74.3	71.9	76.7	67.8	73.2	71.2	76.6	73.1
NOV	70.2	74.2	64.0	71.3	74.8	74.5	68.5	71.1
DEC	74.4	76.1	69.2	73.0	68.3	70.9	71.2	71.9
ANNUAL								

HISTORY OF MONTHLY LADD FACTOR 1980 - 1986  
O A L A I N

MONTH	1980	1981	1982	1983	1984	1985	1986	AVRG
JAN	71.9	71.0	69.3	70.5	73.9	72.6	68.3	71.1
FEB	71.3	71.8	68.0	71.8	71.6	71.7	66.9	70.4
MAR	66.8	56.8	59.8	67.3	56.3	59.1	59.4	57.6
APR	60.4	62.4	56.4	54.3	64.9	59.0	65.2	60.4
MAY	64.9	63.3	70.0	69.7	67.0	68.4	71.9	67.9
JUN	73.2	68.8	76.2	80.3	74.8	75.3	76.8	75.1
JUL	73.4	77.8	76.1	83.1	79.5	78.5	78.0	78.1
AUG	76.4	77.8	79.0	79.1	75.7	76.2	77.1	77.3
SEP	72.2	74.4	76.7	75.3	74.2	72.9	78.0	74.8
OCT	60.8	69.7	68.3	60.3	68.1	65.4	69.5	66.1
NOV	64.1	69.0	60.1	70.2	73.3	70.1	69.8	68.1
DEC	64.8	67.3	67.4	67.3	72.2	70.8	67.4	68.2
ANNUAL								

HISTORY OF MONTHLY LADD FACTOR 1980 - 1986  
C O M B I N E D

MONTH	1980	1981	1982	1983	1984	1985	1986	AVRG
JAN	73.6	71.1	74.5	75.9	76.6	75.1	74.9	74.5
FEB	71.4	73.1	70.9	74.3	73.5	71.0	75.7	72.8
MAR	53.9	58.3	63.4	74.1	59.4	57.4	64.5	61.6
APR	65.7	62.1	62.4	62.5	69.4	62.3	69.9	64.9
MAY	70.8	66.3	73.5	72.0	72.8	72.1	74.3	71.7
JUN	79.3	76.0	80.0	82.3	78.7	80.0	79.3	79.4
JUL	80.1	81.7	82.8	82.0	81.7	81.9	81.1	81.6
AUG	81.5	82.5	80.3	80.3	80.4	81.9	81.6	81.2
SEP	80.8	80.0	78.0	78.7	80.5	81.6	81.6	80.2
OCT	71.1	71.4	74.5	66.7	72.5	71.8	75.4	71.9
NOV	68.9	73.2	63.1	73.0	76.2	74.0	68.8	71.0
DEC	70.6	74.1	68.7	72.0	69.4	71.5	71.2	71.1
ANNUAL								

HISTORY OF MONTHLY WATER PRODUCTION AS % OF PEAK MONTH PRODUCTION 1973-1986  
 ABU DHABI - DESALINATION PLANTS

YEAR	JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER
1973	59.9%	49.6%	52.1%	65.7%	87.8%	92.7%	100.0%	98.0%	93.7%	96.1%	95.5%	98.0%
1974	70.8%	63.8%	79.7%	78.7%	89.9%	86.0%	94.5%	100.0%	85.3%	87.1%	81.8%	90.8%
1975	78.6%	71.6%	80.5%	77.6%	80.2%	100.0%	96.2%	99.2%	96.5%	92.9%	91.6%	91.6%
1976	75.3%	71.7%	78.8%	77.5%	89.9%	94.9%	100.0%	93.6%	88.0%	85.9%	77.6%	76.4%
1977	60.2%	59.9%	68.1%	75.1%	83.0%	85.5%	93.4%	96.0%	90.0%	98.8%	100.0%	97.8%
1978	66.9%	63.3%	76.0%	76.6%	78.9%	85.4%	97.3%	95.7%	92.1%	97.4%	95.6%	100.0%
1979	65.9%	60.9%	76.4%	73.4%	75.3%	72.8%	95.9%	98.4%	97.1%	97.6%	95.7%	100.0%
1980	69.6%	66.1%	68.7%	76.6%	87.6%	87.9%	91.7%	100.0%	93.8%	92.2%	86.7%	87.8%
1981	79.3%	71.7%	79.6%	92.1%	87.9%	90.2%	93.4%	98.8%	93.7%	100.0%	97.4%	98.0%
1982	66.6%	76.9%	81.4%	88.1%	94.8%	94.4%	100.0%	99.1%	96.9%	93.8%	91.5%	91.3%
1983	84.5%	75.7%	84.9%	82.2%	92.2%	91.7%	97.8%	100.0%	96.7%	96.0%	92.2%	93.2%
1984	87.0%	79.8%	89.3%	86.8%	92.1%	93.5%	93.9%	100.0%	90.9%	93.5%	89.9%	88.4%
1985	85.2%	77.9%	88.6%	86.1%	95.8%	94.8%	98.0%	99.6%	97.6%	100.0%	91.3%	94.8%
1986	80.8%	71.9%	81.3%	79.5%	90.5%	91.8%	98.5%	100.0%	93.1%	98.7%	96.0%	93.9%
AVRG	75.0%	68.8%	77.0%	79.4%	87.6%	90.1%	96.6%	98.5%	93.2%	95.0%	91.1%	93.0%





# **CAPACITY AND FORECAST**

FORECAST OF MONTHWISE 1987 PEAK LOAD & GENERATION  
 ASSUMED ANNUAL PEAK LOAD OF 895 MW  
 A B U D H A B I

MONTH	NO. OF HOURS MONTHLY	PK. L'D AS FRAC. OF YR. PK. LD.	MONTHLY LOAD FACTOR	MONTHLY P'K LOAD MW	*10 <sup>6</sup> KWH TO BE GENERATED
JAN	744	0.352	0.752	315	176,261
FEB	672	0.357	0.736	320	158,030
MAR	744	0.502	0.629	449	210,257
APR	720	0.694	0.658	621	294,349
MAY	744	0.879	0.725	787	424,349
JUN	720	0.914	0.807	818	475,308
JUL	744	0.980	0.823	877	537,059
AUG	744	1.000	0.817	895	544,024
SEP	720	0.942	0.811	843	492,297
OCT	744	0.879	0.731	787	427,861
NOV	720	0.627	0.711	561	287,272
DEC	744	0.464	0.719	415	222,148
ANNUAL	8,760	1.000	0.542	895	4,249,131

FORECAST OF MONTHWISE 1987 PEAK LOAD & GENERATION  
 ASSUMED ANNUAL PEAK LOAD OF 345 MW  
 A L A I N

MONTH	NO. OF HOURS MONTHLY	PK. L'D AS FRAC. OF YR. PK. LD.	MONTHLY LOAD FACTOR	MONTHLY P'K LOAD MW	*10 <sup>6</sup> .KWH TO BE GENERATED
JAN	744	0.360	0.711	124	65.700
FEB	672	0.363	0.704	125	59.247
MAR	744	0.533	0.576	184	72.803
APR	720	0.723	0.604	249	108.474
MAY	744	0.889	0.679	307	154.940
JUN	720	0.939	0.751	324	175.169
JUL	744	1.000	0.781	345	200.467
AUG	744	0.971	0.773	335	192.660
SEP	720	0.939	0.748	324	174.469
OCT	744	0.828	0.661	286	140.483
NOV	720	0.523	0.681	180	88.471
DEC	744	0.430	0.682	148	75.274
ANN:	8,760	1.000	0.501	345	1,514.157

FORECAST OF MONTHWISE 1987 PEAK LOAD & GENERATION  
 ASSUMED ANNUAL PEAK LOAD OF 1215 MW  
 C O M B I N E D

MONTH	NO. OF HOURS MONTHLY	PK. L'D AS FRAC. OF YR. PK. LD.	MONTHLY LOAD FACTOR	MONTHLY P'K LOAD MW	*10 <sup>6</sup> KWH TO BE GENERATED
JAN	744	0.372	0.745	452	253.550
FEB	672	0.375	0.728	456	223.818
MAR	744	0.516	0.616	627	303.358
APR	720	0.697	0.649	847	398.157
MAY	744	0.904	0.717	1,098	595.724
JUN	720	0.943	0.794	1,146	660.774
JUL	744	0.983	0.816	1,194	727.757
AUG	744	1.000	0.812	1,215	731.304
SEP	720	0.944	0.802	1,147	661.475
OCT	744	0.870	0.719	1,057	572.982
NOV	720	0.608	0.710	739	377.634
DEC	744	0.462	0.711	561	294.846
ANNUAL	8,760	1.000	0.545	1,215	5,800.779

**CHRONOLOGICAL DEVELOPMENT OF INSTALLED POWER GENERATION CAPACITY  
ABU DHABI AREA**

Year	Month	Stn	Details	Total MW	Cumulative live MW	Capacity at the time of Peak Load	Year	Month	Stn	Details	Total MW	Cumulative live MW	Capacity at the time of Peak Load	
1966	DPS	DE	generators 3x1.088 MW	3.264	3.264		1978	May	UNE	GT 1	61.58	480.894		
1967	DPS	DE	generators 2x2.2 MW	4.4	7.664		Jun	UNE	GT 2	61.58	542.476	501.876*		
1968	DPS	DE	generators 4x1.088 MW	4.352	12.016		1979	-	SPS	5 DE shifted from BYS		542.476		
1969	DPS	Gas	Turbine	13.7	25.716		Jul	UWU	ST 1	60.0	602.476	553.124#		
1970	May	GTS	GT 1 & 2 @ 13.7 MW	27.4	53.116		Nov	UWU	ST 2	60.0	662.476			
Jun	GTS	GT 3		13.7	66.816		1980	Feb	UWU	ST 3	60.0	722.476	673.124#	
Jul	GTS	GT 4		13.7	80.516		Apr	UWU	ST 4	60.0	782.476			
1971	May	GTS	GT 5 shifted from DPS	-	80.516	80.516	Nov	UWU	ST 5	60.0	842.476			
1972	Jul	DPS	GT PK 208	17.9	98.416	98.416	-	DPS	DE gen 6x1.088 & 2.2MW retired	-8.7	833.776			
1974	Jul	GTS	ST 4 @ 15.0 MW	15.0	113.416		-	GTS	DE gen 1.088 MW retired	-1.1	832.676			
Jul	GTS	ST 7 @ 17.9 MW	17.9	131.316	131.316		-	BYS	DE generators 2x2.1 MW	4.2	836.876			
Aug	GTS	GT 8		17.9	149.216		1981	Feb	UWU	ST 6	60.0	896.876	808.424#	
Oct	GTS	GT 9		17.9	167.116		1982	Jul	UWU	ST 9	75.0	971.876	955.424#	
-	-	GTS	DE 1.088 MW shifted from DPS		167.116		1983	Jan	UWU	ST 10	75.0	1046.876		
1975	-	SPS	DE generators 2x3.5 MW	7.0	174.116		Feb	UNE	GT 3	65.0	1111.876			
Jun	GTS	GT 31		17.9	192.016		Mar	UNE	GT 4	65.0	1176.876			
Jul	GTS	GT 32		17.9	209.916	202.916*	Mar	BYS	GT 1	26.9	1203.776			
1976	May	GTS	GT 33	17.9	227.816		Mar	BYS	GT 2	26.9	1230.676			
Jun	GTS	GT 34		17.9	245.716		Mar	BYS	GT 3	26.9	1257.576			
Jul	BYS	DE	generators 5x2.1 MW	10.5	256.216	238.716*	Mar	BYS	GT 4	26.9	1284.476			
Oct	STS	ST 13		20.0	276.216		-	DPS	DE 2.2 MW retired	-2.2	1282.276	1282.260#		
1977	Jan	STS	ST 11	20.0	296.216		1985	-	BYS	DE 5 x2.1MW shifted to Village	-10.5	1271.776		
Mar	STS	ST 12		30.0	306.216		-	SPS	DE 5 x2.1MW shifted to Village	-10.5	1261.276	1282.260#		
Jun	STS	ST 21, 22 & 23		70.0	396.216	378.716*	1986	Dec	UWU	ST 7	160.0	1421.276	1421.276#	
-	-	BYS	DE generators 6x2.1 MW	12.6	408.816		1987	Oct	UWU	ST 8	160.0	1581.276	1421.276#	
1978	-	BYS	DE generators 5x2.1 MW	10.5	419.316									

\* Saadiyat station excluded.

# Saadiyat & Baniyas stations excluded.

@ Saadiyat & Baniyas stations excluded. Also Buston DE at GTS and 5 early DEs at DPS all totalling 7.664 MW retired.

^ Same as @ except that Baniyas included as it is now interconnected.

^ 12.016 MW of diesel generators are retired which were installed before 1969.

# 5 nos of 2.1 MW diesel gen. from BYS and 5 nos of 2.1 diesel gen from SPS are shifted to Village.

CHRONOLOGICAL DEVELOPMENT OF INSTALLED WATER PRODUCTION CAPACITY  
ABU DHABI AREA

Year	Month	Station	Unit	Manufacturers name	Total MGD	Cumulative MGD
1970	May	GTS	D1	WEIR	2	2 Retired
	Aug	GTS	D2	WEIR	2	4
1971	Mar	GTS	D3	WEIR	2	6 Retired
1973	Nov	GTS	D4	WEIR	2	8
1974	May	GTS	D5	WEIR	2	10
1976	Jan	GTS	D6	WEIR	2	12
1977	Mar	STS	D2	SIDEM	3	15
	Apr	STS	D1	SIDEM	3	18
	Jul	STS	D3	SIDEM	3	21
	Sep	STS	D4	SIDEM	3	24
1979	Mar	UNE	D1	SIDEM	5	29
	May	UNE	D2	SIDEM	5	34
	Jul	UNE	D3	SIDEM	5	39
1980	Aug	UNW	D2	IHI	4	43
	Sep	UNW	D1	IHI	4	47
	Oct	UNW	D3	IHI	4	51
	Nov	UNW	D4	IHI	4	55
1981	Jul	UNW	D5	IHI	4	59
	Sep	UNW	D6	IHI	4	63
1984	Mar	GTS	D1	WEIR	-2	61 Retired
	Aug	GTS	D3	WEIR	-2	59 Retired
1984	Oct	UNS		SOLAR	0-02	59.02
1985	Dec	UNW	D7-1	SIDEM	5	64.02
1986	Mar	UNW	D7-2	SIDEM	5	69.02
	May	UNW	D8-1	SIDEM	5	74.02
	Jul	UNW	D8-2	SIDEM	5	79.02
1987	Apr	UNE	D4	ITALIMPIANTI	6	85.02
	Sep	UNE	D5	ITALIMPIANTI	6	91.02 (expected)
	Nov	UNE	D6	ITALIMPIANTI	6	97.02 (expected)

\*STS has two units isolated from the main water network of Abu Dhabi:

1. Aquas-Chen commissioned in 1971 : capacity 0.06 MGD

2. Friedrich-Wald commissioned in 1978 : capacity 0.05 MGD

The Total capacity including SSS at the end of 1987 will stand at 97.13 MGD

ABU DHABI & AL AIN

DEVELOPMENT OF INSTALLED POWER GENERATION CAPACITIES																
YEAR	DPS	GTS	SPS	BYS	STS	UNE	UW	AI	Ain	TOTAL	CAPACITY IN MW	%	SYSTEM	E	S	
																1966
I	1966	3.261								3.261	3.261					
S	1967	7.661							3.01	7.661	10.661					
A	1968	12.001							3.01	12.01	15.01					
L	1969	25.701								25.7	28.7					
E	1970	25.701	64.801						10.2	80.51	90.71					
C	1971	12.001	68.501						10.2	80.51	90.71					
A	1972	29.901	68.501						10.2	98.41	108.61					
P	1972	29.901	68.501						10.2	98.41	108.61					
C	1973	29.901	68.501						10.2	98.41	108.61					
I	1974	28.801	138.301						39.0	167.11	206.11					
E	1975	28.801	134.101	7.001					56.3	209.91	266.21					
S	1976	28.801	209.901	7.001	10.501	201			86.3	276.21	362.51					
I	1977	28.801	209.901	7.001	23.101	1401			135.3	408.81	544.11					
MM	1978	28.801	209.901	7.001	33.601	1401	123.21		184.1	542.51	726.61					
YEAR	1979	28.801	209.901	17.501	23.101	1401	123.21	120	1219.1	662.51	881.61					
E	1980	20.101	208.801	17.501	27.301	1401	123.21	300	1264.9	774.911	1031.81					
I	1981	20.101	208.801	17.501	27.301	1401	123.21	360	1310.7	896.911	1207.61					
I	1982	20.101	208.801	17.501	27.301	1401	123.21	360	1310.7	896.911	1207.61					
I	1983	20.101	208.801	17.501	27.301	1401	123.21	435	1373.7	991.911	1345.61					
I	1984	17.901	208.801	17.501	134.901	1401	253.21	510	1373.7	11292	311456.01					
I	1985	17.901	208.801	7.001	124.401	1401	253.21	510	1373.7	11261	311456.01					
I	1986	17.901	208.801	7.001	124.401	1401	253.21	670	1373.7	11421	311795.01					
I	1987	--	208.801	7.001	124.401	1401	253.21	830	1373.7	11561	311955.01					

- NOTES:
1. GT shifted from Diesel Power Station to GTS as GTWS.
  2. FC 208 installed at Diesel Power Station.
  3. 1 Buston Engine shifted from Diesel Power Station to GTS
  4. 5 Diesel Engine shifted from Bahi Yak to Saadiyat.
  5. DPS Diesel Engine was generating only 2.2 MW and the GTS Diesel Engine is now written off.
  6. Diesel engine in DPS written off.
  7. From SPS 5 DE of 2.1 MW are shifted to LEWA. From BYS 5 DE of 2.1 MW are shifted to DELA.

ABU DHABI # AL AIN

ALL LOAD IN MW

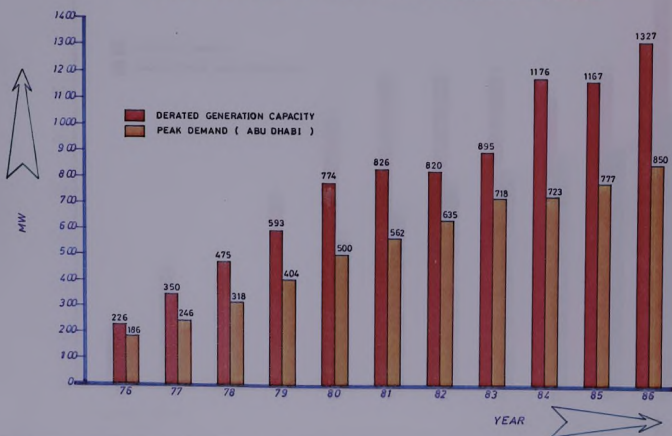
DEVELOPMENT OF DERATED GENERATION CAPACITIES										MAXIMUM DEMAND*		
Year	DPS	GTS	SPS	BTS	STS	UNE	UM	AI AIN	TOTAL CAPACITY	MAXIMUM DEMAND		
										# 9 #10	ABU DHABI	SYSTEM
Commissioned:	1966	May	Nov	July	Oct	May	July	1976	1976			
D	1966	3							3.0	3.0	N/A	N/A
E	1967	7							2.4	7.0	9.4	2.9
F	1968	11							2.4	11.0	13.4	7.5
G	1969	23							2.4	25.0	29.4	14.6
H	1970		48						5.4	71.0	76.4	27.2
I	1971	11	60						5.4	71.0	76.4	30.2
J	1972	26	60						5.4	86.0	91.4	53.0
K	1973	26	60						5.4	86.0	91.4	77.0
L	1974	25	107						26.4	132.0	158.4	104.8
M	1975	25	137	6					30.4	168.0	206.4	137.4
N	1976	25	167	6	10	18			66.4	226.0	292.4	186.1
O	1977	25	167	6	22	130			96.4	350.0	446.4	245.9
P	1978	20	167	6	32	130	120		156.4	475.0	631.4	317.5
Q	1979	18	167	16	22	130	120		186.4	593.0	779.4	403.8
R	1980	15	167	16	26	130	120	300	226.4	774.0	1,000.4	499.8
S	1981	14	160	16	26	130	120	360	266.4	826.0	1,092.4	562.3
T	1982	14	160	16	20	130	120	360	266.4	820.0	1,086.4	634.5
U	1983	14	160	16	20	130	120	435	318.4	895.0	1,215.4	726.8
V	1984	14	156.8	16	100.8	130	250	510	276.0	1,176.0	1,452.0	723.3
W	1985	14	156	7	100	130	250	510	276.0	1,167.0	1,443.0	777.0
X	1986	14	156	7	100	130	250	670	276.0	1,327.0	1,603.0	850.0
Y	1987	14	160	7	100	130	250	830	276.0	1,491.0	1,767.0	895.0

\* Includes demands of Sadiyat # Al Ain  
 † Small diesel engines at Al Ain retired  
 ‡ Unit #1 & 32 derated to 12.0 MW each due to inadequacy of step up X-former capacity  
 § PFR diesel power station retired

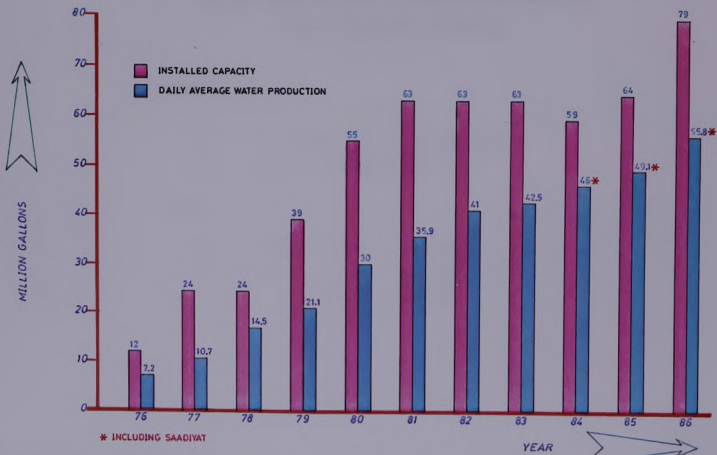


## DERATED GENERATION CAPACITY AND PEAK DEMAND

OF ABU DHABI POWER STATIONS INCLUDING SAADIYAT AND BANIYAS



## GROWTH IN DAILY WATER PRODUCTION CAPACITY



1987-1990 POSITION OF WATER PRODUCTION AND POWER GENERATION

BASED ON THE FOLLOWING ASSUMPTIONS

WATER:

UNE	2 X 6 MGD	Sept & Nov 1987
TAW	Phase A- 3 X 6 MGD	1988

POWER:

UNW	SKODA 1 X 160 MW	Oct 1987
TAW	GE 1 X 84 MW	Oct 1987
	1 X 84 MW	Dec 1987
	1 X 84 MW	Feb 1988

POWER DEMAND FORECAST 1987 - 1995

ACTUAL DEMAND POSITION IN MW SINCE 1973

YEAR	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986
Peak demand	88.2	121.9	164.3	227.7	304.2	397.6	514.0	656.8	748.3	852.5	966.5	973	1063	1136
% Increase	-	38.2%	34.8%	38.6%	33.6%	30.7%	29.3%	27.8%	13.9%	13.9	13.4%	0.7%	9.2%	6.9%
Peak demand month	Sept	Sept	Aug	Aug	July	Aug	July	July	July	Aug	Aug	July	Aug	July

EXPECTED DEMAND IN MW 1987 - 1995

Demand Forecast for Year	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995
Expected Demand Abu Dhabi	850	895	950	1000	1050	1095	1135	1175	1205	1235
Expected Demand Al Ain	321	345	375	400	425	450	470	495	515	530
Expected Demand of Zayed M City	80	115	124	134	145	156	169	183	189	195
Diversity Factor		0.980	0.978	0.976	0.974	0.972	0.970	0.970	0.970	0.970
Total Expected Demand	1136	1215	1374	1479	1558	1632	1697	1772	1832	1889
Average % Increase	6.87	6.95	13.08	7.61	5.34	4.78	4.00	4.38	3.42	3.10

POWER GENERATION POSITION 1987 - 1995

INSTALLED DESPATED CAPACITIES MW

YEAR	1987	1988	1989	1990*	1991	1992	1993	1994	1995
Generation capacities									
GTS	154	100	74	36	11	11	11	11	11
STS	130	130	130	130	130	105	105	105	105
UNW	670	830	830	830	830	830	830	800	770
UNE	250	214	214	214	214	214	130	91	91
BVS	100	100	100	100	100	100	100	72	72
TAW	-	252	252	252	252	252	252	252	252
AIN	270	258	236	216	208	184	167	140	108
<b>TOTAL CAPACITY</b>	<b>1574</b>	<b>1884</b>	<b>1836</b>	<b>1778</b>	<b>1745</b>	<b>1696</b>	<b>1595</b>	<b>1471</b>	<b>1409</b>

CAPACITY VS DEMAND POSITION IN MW 1987 - 1995

Less largest unit	160	160	160	160	160	160	160	160	160
Less 2nd largest unit not equal to largest	75	84	84	84	84	84	84	84	84
Less 10% of Peak demand	122	137	148	156	163	170	177	183	189
<b>TOTAL RESERVE</b>	<b>357</b>	<b>381</b>	<b>392</b>	<b>400</b>	<b>407</b>	<b>414</b>	<b>421</b>	<b>427</b>	<b>433</b>
Net available capacity	1217	1503	1444	1378	1338	1282	1174	1044	976
Expected Peak demand	1215	1374	1479	1558	1632	1697	1772	1832	1889
<b>CAPACITY SURPLUS OR DEFICIT</b>	<b>+2</b>	<b>+129</b>	<b>-35</b>	<b>-180</b>	<b>-294</b>	<b>-415</b>	<b>-598</b>	<b>-788</b>	<b>-913</b>

## CAPACITY VS DEMAND POSITION OF SEAWATER DESALINATION PLANTS - MGD

1987 - 1995

	1987	1988	1989	1990	1991	1992	1993	1994	1995
Abu Dhabi potable water demand	57	61	65	70	74	78	82	86	90
Non potable water demand	53	55	57	58	59	60	62	63	64
Total Abu Dhabi demand	110	116	122	128	133	138	144	149	154
Export to Al Ain	15	20	20	25	25	30	30	30	30
Total expected water demand	125	136	142	153	158	168	174	179	184
Total capacity	77	107	107	107	107	106	104	102	101
Firm capacity available at (75%)	58	80	80	80	80	80	78	77	76
Sewage reclamation capacity	19	20	20	20	20	20	20	20	20
Total firm capacity	77	100	100	100	100	100	98	97	96
Net capacity shortfall	-8	-36	-42	-53	-58	-68	-76	-82	-88
Capacity to be installed at 75% availability (MGD)	64	48	56	71	77	91	101	109	117

POSITION OF INSTALLED DERATED POWER GENERATION CAPACITIES MW

ABU DHABI POWER STATIONS 1967 - 1995

STATION	Date		1967	1968	1969	1990	1991	1992	1993	1994	1995	
	UNIT/Commissioned	Rated/CP										
Gas Turbine Station	1	2/70	13.7	0+14	--	--	--	--	--	--	--	
	2	6/70	13.7	10	--	--	--	--	--	--	--	
	3	6/70	13.7	10	--	--	--	--	--	--	--	
	4	7/70	13.7	10	--	--	--	--	--	--	--	
	5	10/69	13.7	10	--	--	--	--	--	--	--	
	6	8/74	15	12	12	11	11	11	11	11	11	
	7	7/74	17.9	12.5	12.5	--	--	--	--	--	--	
	8	8/74	17.9	12.5	12.5	--	--	--	--	--	--	
	9	10/74	17.9	12.5	12.5	12.5	--	--	--	--	--	
	10	6/75	17.9	12.5	12.5	12.5	--	--	--	--	--	
	11	7/75	17.9	12.5	12.5	12.5	--	--	--	--	--	
	12	7/76	17.9	12.5	12.5	12.5	--	--	--	--	--	
	13	6/76	17.9	12.5	12.5	12.5	--	--	--	--	--	
	Total		200.0	17.9	154	100	74	36	11	11	11	11
Steam Turbine Station	111	1/77	30	29	29	29	29	22.5	22.5	22.5	22.5	
	112	3/77	20	18	18	18	18	15	15	15	15	
	113	10/76	20	18	18	18	18	15	15	15	15	
	121	6/77	20	18	18	18	18	15	15	15	15	
	122	6/77	20	18	18	18	18	15	15	15	15	
	123	6/77	30	29	29	29	29	22.5	22.5	22.5	22.5	
	Total		140	130	130	130	106	106	106	106	106	
UM Steam Turbine Station	1	7/75	60	60	60	60	60	60	60	60	60	
	2	11/75	60	60	60	60	60	60	60	60	60	
	3	2/80	60	60	60	60	60	60	60	60	60	
	4	4/80	60	60	60	60	60	60	60	60	60	
	5	11/80	60	60	60	60	60	60	60	60	60	
	6	2/81	60	60	60	60	60	60	60	60	60	
	7	12/86	160	160	160	160	160	160	160	160	160	
	8	10/87	--	--	160	160	160	160	160	160	160	
	9	7/83	75	75	75	75	75	75	75	75	75	
	10	1/84	75	75	75	75	75	75	75	75	75	
Total		670	670	830	830	830	830	830	800	770		
URE Gas Turbine Station	1	5/78	60	42	42	42	42	42	--	--	--	
	2	6/78	60	42	42	42	42	42	--	--	--	
	3	2/84	65	65	65	65	65	65	65	45.5	45.5	
	4	7/84	65	65	65	65	65	65	65	45.5	45.5	
Total		250	214	214	214	214	214	130	91	91		
RSD Gas Turbine Station	1	3/84	26	25	25	25	25	25	25	18	18	
	2	3/84	26	25	25	25	25	25	25	18	18	
	3	3/84	26	25	25	25	25	25	25	18	18	
	4	3/84	26	25	25	25	25	25	25	18	18	
Total		104	100	100	100	100	100	100	100	72	72	
JAW Gas Turbine Station	1	10/87	--	--	84	84	84	84	84	84	84	
	2	12/87	--	--	84	84	84	84	84	84	84	
	3	2/88	--	--	84	84	84	84	84	84	84	
Total				252	252	252	252	252	252	252		
TOTAL CAPACITY OF ABU DHABI			1351	1304	1626	1600	1562	1537	1512	1428	1351	1301

POSITION OF INSTALLED DERATED CAPACITIES POWER GENERATION (MW)

AL AIN POWER STATION

STATION	Date Commissioned	Rated Capacity	1987	1988	1989	1990	1991	1992	1993	1994	1995
A Station	121.86										
B Station	130										
C Station	114	7/78	15.7	15	11	11	11	11	11	8	8
D'sel/Crude	115	7/78	15.7	15	11	11	11	11	11	8	8
	116	8/78	15.7	15	11	11	11	11	11	8	8
	117	12/78	15.7	15	15	11	11	11	11	11	8
Total	62.8	60	48	44	44	44	44	44	35	32	32
D Station	1	-74	17.35	12	12	-	-	-	-	-	-
Gas turbine	2	-75	17.35	12	12	-	-	-	-	-	-
	3	2/77	17.5	12	12	12	12	12	-	-	-
	4	4/77	17.5	12	12	12	12	12	-	-	-
	5	-79	17.5	15	15	12	12	12	12	12	-
	6	-78	17.5	15	15	12	12	12	12	12	-
	7	6/80	22.9	20	20	20	16	16	16	16	-
	8	7/80	22.9	20	20	20	16	16	16	16	-
	9	-81	22.9	20	20	20	16	16	16	16	16
	10	-81	22.9	20	20	20	16	16	16	16	16
	11	-83	31.5	26	26	26	26	26	22	22	22
	12	-83	31.5	26	26	26	26	26	22	22	22
Total	259.3	210	210	192	172	164	140	132	108	76	
TOTAL CAPACITY AL AIN	322.1	270	258	236	216	208	184	167	140	108	
TOTAL SYSTEM CAPACITY	1673	1374	1186	1186	1178	1145	1196	1195	1147	1140	

Notes: 1. Peak demand is expected to be in August. Hence, the availability in the next year is considered if the unit was commissioned after August.

2. Diesel Generators a - Do not use generators to be run on diesel fuel only  
 b - Derate to 70% after 10 years of use.  
 c - Derate to 50% after 15 years of use.  
 d - Retired after 20 years of service.

3. Gas turbine a - Derate to 70% after 10 years of use.  
 b - Retire after 15 years of service.

4. Steam turbine a - Derate to 75% after 15 years of use.  
 b - Retire after 25 years of service.

5. At GTS units 4 - 5 are not retired as scheduled. Unit 1 has serious vibrations and may be retired this year.

6. At DPS units PK 208 is not retired as scheduled.



POSITION OF INSTALLED DERATED CAPACITY (MGD) OF SEAWATER DESALINATION PLANTS  
1987 - 1995

STATION	Unit	Make	Date of Commissioning	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995
Gas Turbine Station (Mina)	1	WEIR	5/70	-	-	-	-	-	-	-	-	-	-
	2	WEIR	8/70	1	-	-	-	-	-	-	-	-	-
	3	WEIR	3/71	-	-	-	-	-	-	-	-	-	-
	4	WEIR	11/73	1	-	-	-	-	-	-	-	-	-
	5	WEIR	5/74	1	-	-	-	-	-	-	-	-	-
	6	WEIR	1/76	1	-	-	-	-	-	-	-	-	-
Total				4	-	-	-	-	-	-	-	-	-
Steam Turbine Station (Mina)	1	SIDEM	4/77	3	3	3	3	3	3	2.4	2.4	2.4	2.4
	2	SIDEM	3/77	3	3	3	3	3	3	2.4	2.4	2.4	2.4
	3	SIDEM	7/77	3	3	3	3	3	3	3	2.4	2.4	2.4
	4	SIDEM	9/77	3	3	3	3	3	3	3	2.4	2.4	2.4
	Total				12	12	12	12	12	12	11	9	9
Umm Al Mar East Station	1	SIDEM	3/79	5	5	5	5	5	5	5	5	4	4
	2	SIDEM	5/79	5	5	5	5	5	5	5	5	4	4
	3	SIDEM	7/79	5	5	5	5	5	5	5	5	5	4
	4	ITAL	4/87	-	6	6	6	6	6	6	6	6	6
	5	ITAL	9/87	-	6	6	6	6	6	6	6	6	6
	6	ITAL	11/87	-	6	6	6	6	6	6	6	6	6
Total				15	21	33	33	33	33	33	33	31	30
Umm Al Mar West Station	1	IHI	9/80	4	4	4	4	4	4	4	4	4	4
	2	IHI	8/80	4	4	4	4	4	4	4	4	4	4
	3	IHI	10/80	4	4	4	4	4	4	4	4	4	4
	4	IHI	11/80	4	4	4	4	4	4	4	4	4	4
	5	IHI	7/81	4	4	4	4	4	4	4	4	4	4
	6	IHI	9/81	4	4	4	4	4	4	4	4	4	4
	7	SIDEM	12/85	5	5	5	5	5	5	5	5	5	5
	8	SIDEM	4/86	-	5	5	5	5	5	5	5	5	5
	9	SIDEM	5/86	-	5	5	5	5	5	5	5	5	5
	10	SIDEM	7/86	-	5	5	5	5	5	5	5	5	5
Total				29	44	44	44	44	44	44	44	44	44
Taweelah Station	1	SIDEM	3/87	-	6	6	6	6	6	6	6	6	6
	2	SIDEM	6/87	-	6	6	6	6	6	6	6	6	6
	3	SIDEM	9/87	-	6	6	6	6	6	6	6	6	6
Total				-	18	18	18	18	18	18	18	18	18
Total Capacity				60	77	107	107	107	107	106	104	102	101
Firm Capacity at 75%				45	58	80	80	80	80	78	77	76	

NOTE :

1. Units are derated to 80% after 15 years of service.
2. Units are retired after 20 years of service.
3. Availability is considered in the next year if the unit is commissioned after August.

PROCEEDINGS OF THE CONFERENCE ON PERSONNEL ADMINISTRATION  
 1970-71  
 PREPARED BY THE NATIONAL ASSOCIATION OF PERSONNEL ADMINISTRATORS  
 AND THE NATIONAL ASSOCIATION OF PUBLIC PERSONNEL ADMINISTRATORS

TABLE I  
 PERSONNEL ADMINISTRATION - A SUMMARY OF THE 1970-71 CONFERENCE

Session	Topic	Date	Time	Location	Chairman	Participants
1	Opening Session	September 22	9:00 A.M.	Washington, D.C.	John A. Legler	100
2	Personnel Administration in the Public Sector	September 22	10:30 A.M.	Washington, D.C.	John A. Legler	100
3	Personnel Administration in the Private Sector	September 22	12:00 P.M.	Washington, D.C.	John A. Legler	100
4	Personnel Administration in the Non-Profit Sector	September 22	2:30 P.M.	Washington, D.C.	John A. Legler	100
5	Personnel Administration in the Public Sector (Continued)	September 22	4:00 P.M.	Washington, D.C.	John A. Legler	100
6	Personnel Administration in the Private Sector (Continued)	September 22	5:30 P.M.	Washington, D.C.	John A. Legler	100
7	Personnel Administration in the Non-Profit Sector (Continued)	September 22	7:00 P.M.	Washington, D.C.	John A. Legler	100
8	Closing Session	September 22	8:00 P.M.	Washington, D.C.	John A. Legler	100

# PERSONNEL ANALYSIS

DIRECTORATE OF POWER STATIONS & DESALINATION PLANTS

STATIONWISE STAFF CLASSIFICATIONS AS OF 31.12.86

Station/Location	Maintenance													GP & MS	Other <sup>1</sup>	TOTAL	
	Admn	Oper	Elec	Mech	Inst	Corr	Lab	A/C	W/S	Tc/C	Hort	Stor	Proj				Clea
Abu Dhabi	17	13	15	22	22	31	18	22	242	1	11	0	0	20	0	4	438
Baniyas	3	29	8	18	6	0	0	0	2	7	2	4	2	3	0	1	85
Central	21	0	0	0	0	0	0	0	0	0	3	0	3	0	16	48	91
Diesel Power	2	9	2	3	0	0	0	0	0	0	0	0	0	0	0	0	16
Gas Turbine	0	88	18	52	17	0	0	0	0	0	0	0	0	0	0	0	175
Sadiyat power	0	5	2	5	0	0	0	0	0	0	0	0	0	1	0	0	13
Sadiyat desal	4	9	0	7	0	0	0	0	0	0	0	0	0	0	0	0	20
Steam Turbine	0	94	10	49	11	0	0	0	0	0	0	0	0	0	0	0	164
Umm Al Nar	30	0	0	0	0	19	40	14	31	89	10	38	15	12	0	9	307
Umm Al Nar East	2	72	12	69	15	0	0	0	0	0	0	0	4	0	0	0	174
Umm Al Nar West	3	163	35	92	26	0	0	0	0	0	0	0	0	0	0	0	319
Umm Al Nar (9610)	0	25	3	0	2	0	0	0	0	0	0	0	0	0	0	0	30
TAMELHAH	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
Total	82	507	105	317	99	50	58	36	275	97	26	42	24	36	16	63	1833

1. Others:- GP&MS, Civil Engineering, Safety, RIS, COG, MTL, PSYS etc.

DISCRETE OF POWER STATION & TERMINAL 2 PLANT  
 BASIC & TOTAL SALARY OF STAFF BY GRADE AS ON 7/1/74

( Includes all allowances but excludes value of  
 accommodation, air fare & gratuity )

GRADE	PERSONS	TOTAL BASIC SALARY	AVERAGE BASIC SALARY	TOTAL SALARY	AVERAGE TOTAL SALARY
Sp1	33	400,300	12,130	439,571	13,320
1/1	4	27,300	6,825	43,700	10,925
1/2	10	63,300	6,330	96,900	9,690
2/1	15	86,500	5,766	117,900	7,853
2/2	59	284,400	4,820	391,150	6,629
2/3	99	405,940	4,100	610,764	6,169
2/4	159	534,460	3,361	793,576	4,991
3/1	339	898,240	2,649	1,329,301	3,921
3/2	325	694,590	2,137	1,103,785	3,396
3/3	248	432,660	1,744	620,339	3,307
3/4	170	241,810	1,422	494,591	2,909
4/1	94	120,250	1,279	234,744	2,497
4/2	37	41,420	1,119	84,226	2,276
4/3	36	35,100	975	70,360	1,954
4/4	33	27,030	819	55,504	1,681
Monthly	37	102,000	2,756	102,000	2,756
Daily	135	164,220	1,216	164,220	1,216
TOTAL	1,833	4,559,520	2,487	6,952,131	3,792

.....  
 DIRECTORATE OF POWER STATIONS & INSULATION PLANTS  
.....  
 STAFF BY HIGHEST EDUCATIONAL DEGREE AND GRADE AS OF 31.12.86  
.....

QUALIFICA/GRADE	Spl	1/1	1/2	2/1	2/2	2/3	2/4	3/1	3/2	3/3	3/4	4/1	4/2	4/3	4/4	Monthly	Daily	TOTAL
NOT MENTIONED	1	2	3	0	5	6	19	50	28	27	22	18	10	8	11	0	53	143
NO DEGREE	0	0	0	0	1	3	4	5	9	10	16	19	11	5	7	0	15	105
OTHER DEGREES	5	0	1	1	5	14	23	45	32	28	15	5	1	2	1	0	3	191
PRIMARY	0	0	0	1	1	2	2	13	32	12	7	5	3	4	3	7	7	99
CLASS VI - I	0	0	0	1	0	1	2	0	15	24	20	24	6	8	6	15	23	153
MATRIC/SECONDARY	0	0	1	1	2	10	10	39	57	69	53	15	6	8	5	15	28	319
DIPLOMA ELEC	1	0	0	0	1	0	11	36	34	14	9	0	0	0	0	0	0	1
DIPLOMA MECH	0	0	0	0	0	4	14	32	41	37	4	0	0	0	0	0	0	1
DIPLOMA OTHERS	0	0	1	0	0	2	5	14	20	16	16	4	0	0	0	0	0	5
ENG CERTIFICATE	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	2
MISER SECONDARY	0	0	0	0	0	3	3	18	11	13	5	4	0	1	0	0	0	58
BACHELOR SCIENCE	0	0	0	1	0	0	10	27	19	15	2	0	0	0	0	0	0	72
BACHELOR ARTS	0	0	0	0	0	1	2	5	5	5	0	0	0	0	0	0	0	12
BACHELOR COMMERCE	0	0	0	0	0	0	1	0	0	1	1	0	0	0	0	0	0	3
MASTER SCIENCE	0	0	1	0	1	1	11	2	1	0	0	0	0	0	0	0	0	17
BACHELOR MECH ENG	9	0	2	1	14	21	22	36	14	0	0	0	0	0	0	0	0	119
BACHELOR ELEC ENG	4	0	1	3	21	20	22	18	5	0	0	0	0	0	0	0	0	89
BACHELOR CIVIL ENG	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	2
BACHELOR INSTR ENG	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
BACHELOR MECH ENG	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	2
BACHELOR ENG	2	0	1	0	0	2	4	1	0	0	0	0	0	0	0	0	0	14
MASTER MECH ENG	1	0	0	1	1	2	5	1	0	0	0	0	0	0	0	0	0	11
MASTER ELEC ENG	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	6
MASTER CIVIL ENG	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
MASTER MECH ENG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
MASTER CIVIL ENG	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
MASTER ENG	1	1	0	1	3	3	1	0	0	0	0	0	0	0	0	0	0	10
POST GRADUATE DIP	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
DOCTORATE	7	0	0	1	1	2	0	0	0	0	0	0	0	0	0	0	0	11
TOTAL	33	4	10	15	99	99	159	330	325	240	170	94	37	36	33	37	135	1833

DIRECTORATE OF POWER STATION & DESALINATION PLANTS  
STAFF BY NATIONALITY AND GRADE AS OF 31.12.86

COUNTRIES	SPL	1/1	1/2	2/1	2/2	2/3	2/A	3/1	3/2	3/3	3/A	4/1	4/2	4/3	4/A	Monthly	Daily	% OF			
																TOTAL		TOTAL			
AFGHANISTAN	0	0	0	0	0	0	0	0	1	1	0	1	0	0	0	0	0	3	.18		
AMERICA	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	.10		
BAHRAIN	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	2	.10		
BANGLADESH	2	0	0	0	7	10	15	43	51	27	14	5	3	5	2	0	8	142	10.47		
BRITAIN	14	0	0	0	2	2	1	0	0	0	0	0	0	0	0	0	0	19	1.03		
SRI LANKA	0	0	0	0	0	0	1	0	1	1	0	0	0	0	0	0	0	3	.16		
EGYPT	5	0	1	4	9	24	44	73	56	39	25	7	4	2	0	0	13	300	16.36		
INDIA	2	0	2	1	9	14	25	61	61	44	40	39	14	15	18	0	49	414	22.58		
INDONESIA	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	.05		
IRAN	0	0	0	0	0	0	1	1	0	1	3	2	4	1	3	0	0	1	.17	.92	
IRAQ	2	0	0	0	1	1	4	1	3	2	1	0	0	0	0	0	0	3	21	1.14	
JORDAN	0	0	0	0	1	0	1	5	4	3	0	1	0	0	0	0	0	0	15	.81	
LEBANON	0	0	0	0	1	4	1	0	0	0	0	0	0	0	0	0	0	1	7	.38	
MOROCCO	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	.05
OMAN	2	3	7	4	9	26	31	45	57	24	2	2	2	0	0	0	37	0	249	13.58	
QATAR	0	0	0	0	0	0	0	1	1	1	3	0	2	1	1	0	1	1	11	.60	
PAKISTAN	2	0	0	1	12	12	9	63	44	57	46	19	2	10	8	0	48	335	18.27		
PALESTINE	0	0	0	0	2	1	9	24	18	9	9	0	2	0	0	0	2	76	4.14		
POLAND	0	1	0	0	3	0	1	0	0	0	0	0	0	0	0	0	0	0	5	.27	
SAUDI ARABIA	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	2	.10	
SOMALIA	0	0	0	0	1	4	2	7	7	13	13	9	1	1	1	0	4	43	3.43		
SUDAN	2	0	0	1	3	2	7	9	9	10	6	2	1	0	0	0	1	53	2.89		
SYRIA	0	0	0	1	0	0	2	3	2	1	0	3	0	0	0	0	0	10	.54		
TANZANIA	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	.05	
TUNISIA	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	2	.10	
TURKEY	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	.05	
YEMEN	0	0	0	0	0	0	0	1	3	3	8	6	4	0	0	0	0	3	28	1.52	
TOTAL	33	4	10	15	59	99	159	339	325	248	170	94	37	36	33	37	135	1833	100.00		

DIRECTORATE OF POWER STATIONS

YEARWISE RECRUITMENT OF PERSONNEL WHO ARE AVAILABLE AS ON 31-12-86

(The grades shown are present grade and not necessarily the grades in which the staffs were recruited)

Year/Grade	Sp1	1/1	1/2	2/1	2/2	2/3	2/4	3/1	3/2	3/3	3/4	4/1	4/2	4/3	4/4	MONTHLY DAILY	TOTAL
Upto 1976	3	2	5	4	13	19	2	72	59	53	27	6	7	10	0	0	305
1976	3	1	0	1	4	2	16	49	21	31	22	33	5	5	0	0	193
1977	2	0	0	1	2	13	9	18	36	22	6	4	1	2	3	0	120
1978	2	0	3	4	11	17	26	35	40	14	5	3	6	2	5	0	173
1979	4	0	0	2	10	11	20	39	29	18	13	7	1	2	3	0	161
1980	0	0	0	0	2	12	23	40	51	54	41	10	5	0	3	0	249
1981	0	0	1	0	3	8	6	16	13	15	18	7	3	1	2	0	111
1982	16	0	1	0	1	3	14	12	13	15	15	5	2	3	4	0	113
1983	3	1	0	2	3	9	8	26	21	8	2	2	0	0	0	0	97
1984	0	0	0	0	0	1	2	5	22	3	1	9	4	7	3	0	112
1985	0	0	0	1	3	3	5	11	9	9	16	5	2	4	9	13	118
1986	0	0	0	0	2	1	5	16	11	6	2	3	1	0	1	24	81
TOTAL	33	4	10	15	59	99	159	339	325	248	170	94	37	36	33	37	1,833

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1901	10	15	20	25	30	35	40	45	50	55	60	65
1902	12	18	23	28	33	38	43	48	53	58	63	68
1903	14	20	25	30	35	40	45	50	55	60	65	70
1904	16	22	27	32	37	42	47	52	57	62	67	72
1905	18	24	29	34	39	44	49	54	59	64	69	74
1906	20	26	31	36	41	46	51	56	61	66	71	76
1907	22	28	33	38	43	48	53	58	63	68	73	78
1908	24	30	35	40	45	50	55	60	65	70	75	80
1909	26	32	37	42	47	52	57	62	67	72	77	82
1910	28	34	39	44	49	54	59	64	69	74	79	84

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