



Commonwealth Utilities Corporation

Power Generation



22nd February 2005

Power Generation Division

1. The Commonwealth Utilities Corporation, Power Generation Division is currently burning / operating LSADO (Low Sulphur Automotive Diesel Oil), which contains less than $\frac{1}{2}$ % sulphur and therefore has less impact on the environment than high sulphur fuels.



CUC Power Plant I

2. Our Power Production facility consists of four (4) Power Plants that provide reliable and efficient electricity to the Island of Saipan.

Power Plant No. 1 which is the biggest and supplies the majority of the electricity to the island of Saipan comprises total of eight (8) Diesel Engines.

The Mitsubishi – M.A.N. 18V 40/54A Engines 1 ~ 4 are from 1979-83 and each can produce 7,270 kW. (10,232 metric HP)

The other four are Mitsubishi – M.A.N. 18V 52/55B Engines 5 ~ 8 are from 1989-91 and each can produce 13,040 kW. (17,729 metric HP)

Average specific Fuel oil consumption @ 85 % load is 15 kwh/gal, and consumes fuel about 70,000 gals per day.

Power Plant 1 produces approximately 76 % of the island production or a total average of 354,576 MWh per year based on generation figures for 2003 ~2004.

POWER PLANT I			
UNIT	Design MW	Available MW	Remarks
D/E NO. 1	7.27	6.0	
D/E NO. 2	7.27	6.0	
D/E NO. 3	7.27	6.0	
D/E NO. 4	7.27	6.0	
D/E NO. 5	13.04	10	
D/E NO. 6	13.04	10	
D/E NO. 7	13.04	10	
D/E NO. 8	13.04	10	
Total	81.2	64.0	

Power Plant I units #5~8 were de-rated to 10.0 Mw due to engine cooling system problem especially during hot sunny weather.

Power Plant II is mainly used as a stand-by / back-up plant for use during overhaul of the engines at Power Plant 1 or in case of unforeseen problems with any of the engines.

Power Plant II has a total of 6 units and is currently able only to produce a total of 3,200 kW due problems on the other units.

Power Plant II produces approximately 1.4 % of the island production or a total average of 7,319 MWh per year based on generation figures for 2003-2004.

POWER PLANT II			
UNIT	Design MW	Available MW	Remarks
D/E NO. 1	2.5	0.0	Down due to Defective Rectifier on 01/27/04
D/E NO. 2	2.5	0.0	Waiting for T/C ass'y & gen. bearing sleeve
D/E NO. 3	2.5	0.0	Waiting for engine parts
D/E NO. 4	2.5	1.5	
D/E NO. 5	2.5	1.7	
D/E NO. 6	2.5	0.0	Down due to crankshaft problem
Total	15.0	3.2	

Power Plant III was only used as stand-by / back-up plant and presently not operational.

Power Plant IV is owned by CUC but operated by PMIC on a long-term contract.

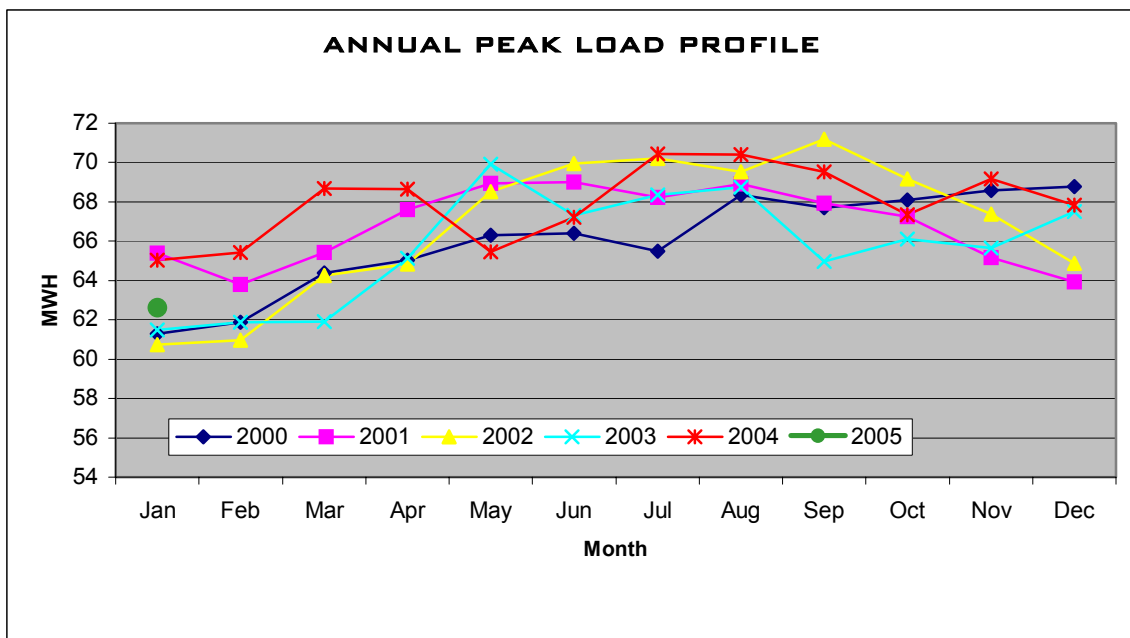
The plant comprises of 9 engines of different manufacturers and is presently able to produce a total of 15,400 kW.

POWER PLANT IV			
UNIT	Design MW	Available MW	Remarks
D/E NO. 1	3.50	3.20	
D/E NO. 2	2.50	2.10	
D/E NO. 3	2.50	2.10	
D/E NO. 4	2.50	2.10	
D/E NO. 5	2.50	2.10	
D/E NO. 6	1.00	0.95	
D/E NO. 7	1.00	0.95	
D/E NO. 8	1.00	0.95	
D/E NO. 9	1.00	0.95	
Total	17.5	15.40	

Power Plant IV produces approximately 23 % of the island production or a total of 98,977 MWh per year based on generation figures for 2003~2004

Others. Besides the power generated by these Power Plants, a substantial amount of power is being generated by hotels, garment industries and other business establishments not connected to the CUC power grid. All these commercial power plants are also generating their power by using diesel driven engines.

Peak load graph show the increase of the load from March and significantly dropping in October as the weather cools down.



3. Drop in Generation for the month of May in 2004 as indicated is attributed to the overhaul of D/E 2, crankpin #5 repair on D/E 3, load downgrade of D/E 5 from 10 Mw to 6.5 Mw due to Turbocharger problem. Also, as shown on the graph load improved on July & August after engines were put back to service after the repair.
4. During the last few years Power Generation has been working persistently in cutting production cost and achieve the highest possible safety and efficiency.

Unmanned 13.8KV substation in Lower Base and Chalan KIYA are remotely controlled and monitored using SCADA system (Advance Control – PRISM SCADA UNIX operating system based). Central control unit is at Power Plant I.



Installation of SCADA System

Also, Diesel Engine no. 6 (13 MW) at Power Plant I was partially equipped with SCADA system to obtain a much-improved control and monitoring of the Engine parameters and it's Auxiliary System. This SCADA system is "Windows" operating system based, ABB SATTGRAPH 5000. However, due to some software/programming problem, SCADA system for Engine #6 is off-line.

5. Further, the Clean Air Act requirements may require un-proportional high investments on the older and inefficient plants such as Power Plant II, III and IV.

6. The Power Production Program (PP I, & II) at this present time employs 69 personnel. These are divided in two groups, 49 local hired employees and 20 foreigners hired from private Manpower Company.



Overhaul of 13 MW Engine

Power Generation Division introduced the organizational changes, improvements and proper technical trainings in the overall workforce in order to achieve a more professional and suitable Maintenance and Operation program. Our Power Production Program will continue to provide a more efficient and reliable power supply to the community and the island of Saipan.

If you should have any questions or topics you would like to have clarified, do feel free to contact us.

Almondo C. Santos

Manager, Power Generation Division

Saipan Utility:

Currently Saipan have four Power Plants; Power Plant I is the Main Power Plant that produces approximately 76% of the Island Power and have available generating capacity of 65.0 MW. Power Plant I consist of existing plant, which was build in mid 1970 with four units, rated at 7.2 MW each. Phase I and Phase II, which was build adjoining to existing plant in 1988 completed in 1992 with four additional units with 13.0 MW each. Power Plant # 2 is a backup unit, which was, build in 1986 and produces 3.5 MW of backup power with less that one percent (1%) of the island power. Power Plant III is out of commission, although their generating capacity at one time was 1.8 MW. PP IV is an Independent Power Purchase (IPP), which produces approximately 23% of the island power, or 10.1 MW daily. PP IV total generating capacity is approximately 15.0 MW.

Our total combine generating capacity is 79 MW. Our highest peak load for 2005 is 63 MW on February 1, 2005. Our highest peak load was noted at 72.0 MW in July 12, 2002. Our average daily load capacity ranges from 40-50 MW.

Approximately 10 MW –15 MW of unconnected load, this unconnected load is from the business sector like hotels, garment factories and golf resorts. It is recommended from a consulting firm to installed additional 15 MW-30 MW generating capacity in the next three to five years and additional 15 MW if require by year 2015.

We are so dependent with diesel fuel. We received our fuel delivery every 22-26 days. It has been recommended to use Heavy Fuel Oil due to the rising prize of diesel fuel, although we are required to submit air permitting to EPA for compliance due to environmental issue.

Our concern is to connect with other utilities, companies to find alternative power source such as Wind, Solar and Hydropower including advantages and disadvantages especially on an island battered with typhoon and cost effective comparing with our current power.

We expect to learn a lot in regards the renewable energy workshop and we are hoping that PPA would also acquire information thru Federal Grants and guide the participants to allocate funds for the alternative power.

- Presented By Lee Lieto & Patrick Reyes