

GRENADA ELECTRICITY SERVICES LIMITED

Monthly Report for Generation Department

DECEMBER 2011

	Gen Gross (kWh)	Gen Net (kWh)	Peak Load (kW)	Fuel Oil Received (US gal)	Heat Rate (KJ/kWh)	Lube Oil Used Make up (U.S gal)	Lube Oil Consumption (g/kWh)
Petite Martinique	71,253	66,718	148	8,690	12,343	31	1.48
Carriacou	704,836	696,572	1,300	51,240	10,174	19	0.09
Queens Park	15,736,118	15,245,518	27,693	1,018,957	8,390	3,342	0.43
SGU (103B & R2)			2,865				
Fuel Used (Vehicles Usage)							
Fleet (US gals)			2,947				
Q/Park (US gals)			38.6				
C & PM (US gals)			163				
Oil on Hand	Delo 1000 Marine (US gals) Plant A	Delo 1000 Marine (US gals) Plant B	Delo 1000 Marine (US gals) Drums	Texaco URSA Super Plus 15W40 (US gals)			
Queens Park	369	3490	-	1,650			
Carriacou				1,265			
Petite Martinique				428			

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Figure (iii) - Lost Time Accident

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Figure (i) - Energy Generated

Figure (ii) - Load Variation

SECTION I

GRENADA, CARRIACOU & PETITE MARTINIQUE

1.1 GENERATION SUMMARY

1.1.1 EXECUTIVE SUMMARY (January to December)

Station	Peak Load (KW) YTD	Peak Load % vs '10	Gross Gen (kWh) YTD	Gross Gen % vs '10	Engine Availability YTD (%)			Gross Fuel Efficiency YTD (kWh/USG)			Forced Outage Rate YTD (%)		
					Tar	2011	2010	Tar	2011	2010	Tar	2011	2010
Queen's Park	30,290	-1.75%	194,944,834	-2.34%	92	92.3	92.4	16.00	16.1	16.3	2.4	2.7	3.6
Carriacou	1,340	2.29%	8,198,610	-0.85%	95	99.2	92.6	15.25	16.8	14.9	2.4	5.5	6.0
Petite Martinique	151	0.00%	830,391	1.73%	95	95.8	99.6	11.50	11.5	11.7	3	0.0	0.0

1.1.2 QUEEN'S PARK POWER STATION SUMMARY (January to December)

UNIT DESIGNATION	Installed Capacity (kW)	Gross Gen (KWh) 2011 YTD	Gross Gen (KWh) 2010 YTD	Engine Availability (%) YTD			Gross Fuel Eff. (kWh/USG) YTD			Forced Outage Rate (%) YTD		
				Tar	2011	2010	Tar	2011	2010	Tar	2011	2010
MAK 1	5,500	25,522,777	25,528,164	85	86.2	97.5	16.4	16.12	16.26	2.4	1.0	2.0
MAK 2	5,500	18,189,224	24,149,750	95	91.6	96.8	16.3	16.45	16.41	2.4	5.3	2.4
MAK 3	7,450	45,762,443	40,048,036	90	92.4	82.4	16.5	16.53	16.61	2.4	2.6	4.8
WARTSILA 4	8,000	43,495,969	49,113,775	90	94.1	94.8	16	16.21	16.44	2.4	2.6	3.6
WARTSILA 5	8,000	48,761,663	47,397,368	90	94.5	92.6	16	16.05	16.40	2.4	1.3	4.1
WARTSILA 12	5,000	6,839,000	9,044,000	95	92.9	94.5	15.5	15.56	14.70	2.4	2.5	1.6
CAT 3500's	9,140	6,373,758	4,336,276	90	94.1	87.9	14.5	15.79	14.14	2.4	3.9	6.7
TOTAL	48,590	194,944,834	199,617,368	92	92.3	92.4	16	16.14	16.25	2.4	2.7	3.6

1.1.3 GENERATION PERFORMANCE vs. PERFORMANCE TARGETS

PERFORMANCE INDICATORS	TARGET	2007	2008	2009	2010	2011	TRAFFIC LIGHT
System Load Factor (%)	> 74%	84.23	70.39	70.36	71.64	71.19	
Generation Reserve Margin (%)	> 50%	78.88	65.47	59.54	57.61	60.42	
Plant Energy Consumption (%)	< 3.4%	3.39	3.27	3.38	3.08	3.11	
Utilization Factor (%)	< 45%	40.59	42.85	45.64	46.90	45.80	
Generation Non-Served Energy (%)	0.02%	0.01	0.02	0.02	0.02	0.01	
Fuel Efficiency (kWh/USG)	16.00	16.38	16.27	16.34	16.22	16.14	
Incident Rate (incidents per 100 employees.)	0.0	0.20	0.03	0.00	0.00	0	
Engine Availability (%)	90%	86.1	87.3	86.59	92.38	92.26	
Forced Outage Rate (%)	2.4%	5.88	14.31	7.79	3.9	2.75	
Vehicle Availability (%)	95%	91.78	91.13	90.60	95.09	94.93	
Maintenance Overtime (%)	7%	15.48	15.21	12.26	3.27	4.82	
Plant Lube Oil Consumption (g/kWh)	< 0.65	0.74	1.02	0.63	0.45	0.57	

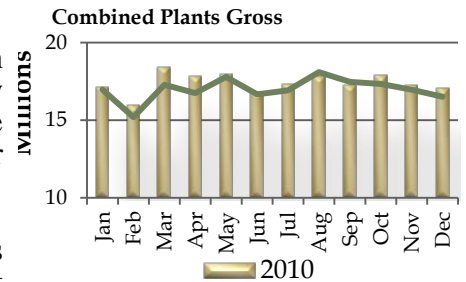
1.1.4 GROSS GENERATION

All Plants combined have a gross generation of 16.5GWhrs which is 3% less than last December. YTD gross energy remains 2.23% lower than last years and with the exception of February through April energy remains close to last year's month-to month demand. The difference observed in February through April were from a hot dry season last year versus a cooler dry season this year resulting in lower energy demand.

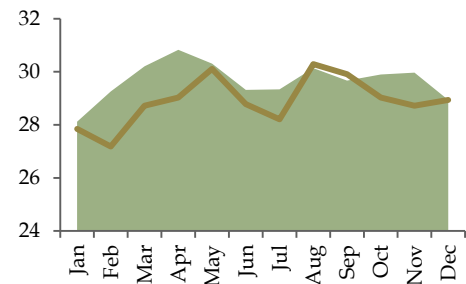
At Queen's Park, Gross generation was 16.5 GWhrs, which is 3% less than last December. Net generation was 16GWhrs resulting in Plant Consumption of 3.05%. Peak demand was 27,693 kW which is 4.3% less than December 2010.

At Carriacou, the gross generation in December was 704,836 kWhrs, which was 1.7% less than last December's generation. The peak demand was 1,310kW which is the same as last December's peak.

In Petite Martinique, gross generation was 71,253 kWhrs which is a 5% increase over the same period in 2010. Peak demand was 148 kW.



12-Month Peak Load Profile



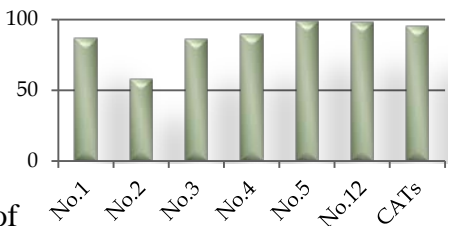
1.1.5 ENGINE AVAILABILITY

Engine availability at Queen's Park was 87.5% due to a prolonged outage on MaK 2.

In both Carriacou and Petite Martinique, engine availability was 74.8% and 99.9% respectively.

The availability in Carriacou was impacted by the continued outage of Cummings #3

AVERAGE AVAILABILITY(%)



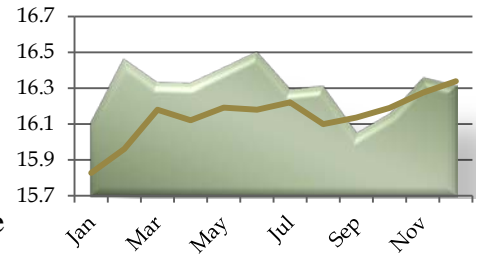
1.1.6 FUEL EFFICIENCY

Fuel Efficiency at Queen's Park in December was the best for the year at 16.34kWh/gallon.

Carriacou & Petite Martinique fuel efficiency was 13.64kWh/gal and 11.3kWh/gallon respectively.

The fuel efficiency in Carriacou suffered because of the prolonged use of unit#105 caused by the catastrophic failure of Cummings #3 unit.

12-Month Gross Fuel Efficiency



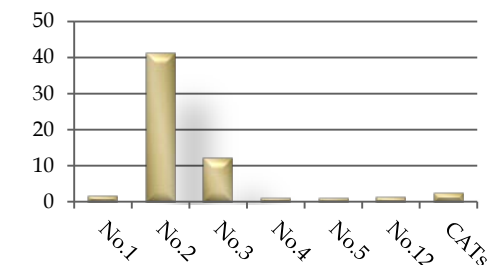
1.1.7 FORCED OUTAGE RATE

In December, the forced outage rate in Queen's Park was 8.59% due to B6 cylinder valve failure on MaK 2.

In Carriacou, forced outage was increased to 25% due to the catastrophic failure Cummins No.3 in early November. Unit is expected to be back on line by mid-January.

Petite Martinique recorded 0.0% Forced outage.

FORCED OUTAGE RATE (%)



1.2 ENVIRONMENTAL REPORT

The following table shows records of environmental activities in Grenada, Carriacou and Petite Martinique for the month of December 2011.

Queen's Park 3-Month Performance				
		October	November	December
NAWASA	Celestine	31,436	39,361.6	43,588
Water	D' Arbeau	0	27.2	86.6
Solid Waste Removed		330	412.5	330
Oily Waste Removed		0	0	0

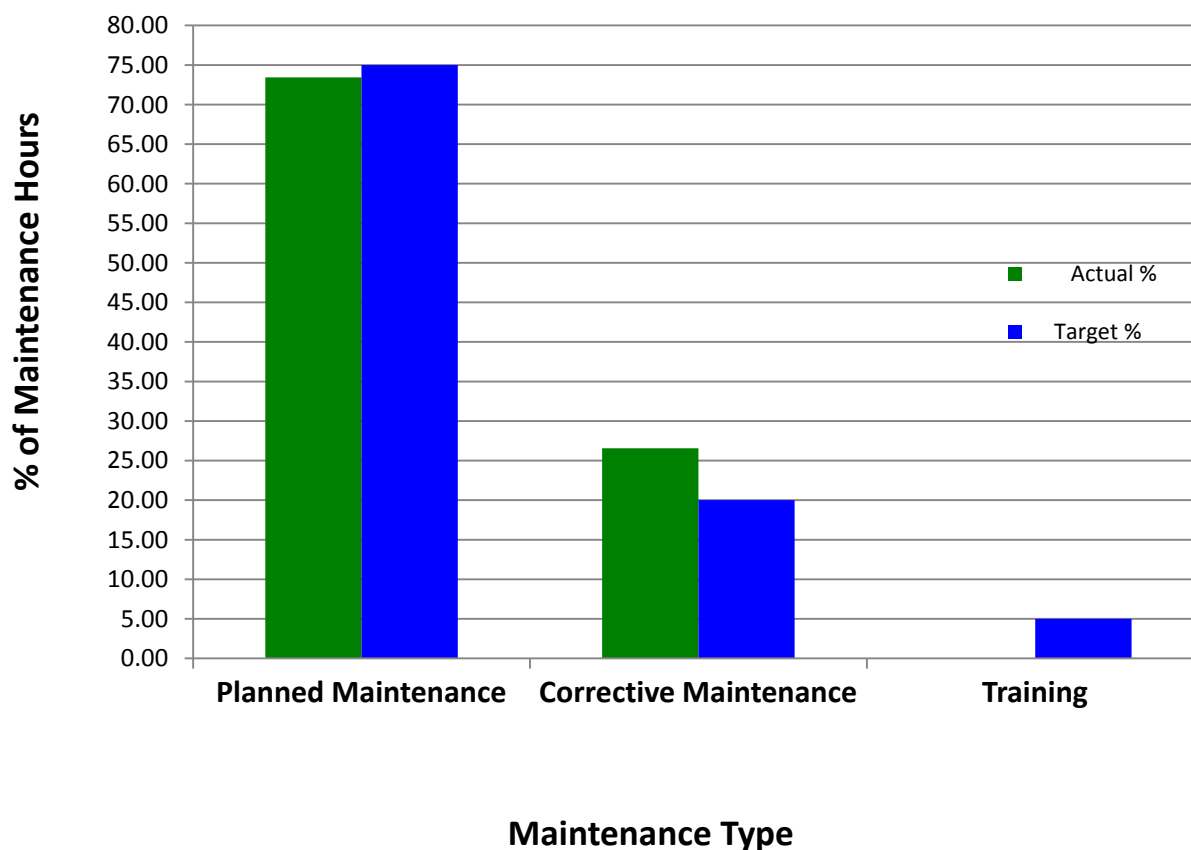
A coolant leak on MaK 1 charge cooler is the major contributor for the observed increase in water consumption at Queen's Park. A Replacement charge cooler is on order.

Administrative Energy 3-Month Performance			
	October	November	December
Queen's Park	22,954	23,594	21,755
Carriacou (T&D)	1,047	832	618
Carriacou (Office)	910	891	835
Petite Martinique (Office)	911	885	849

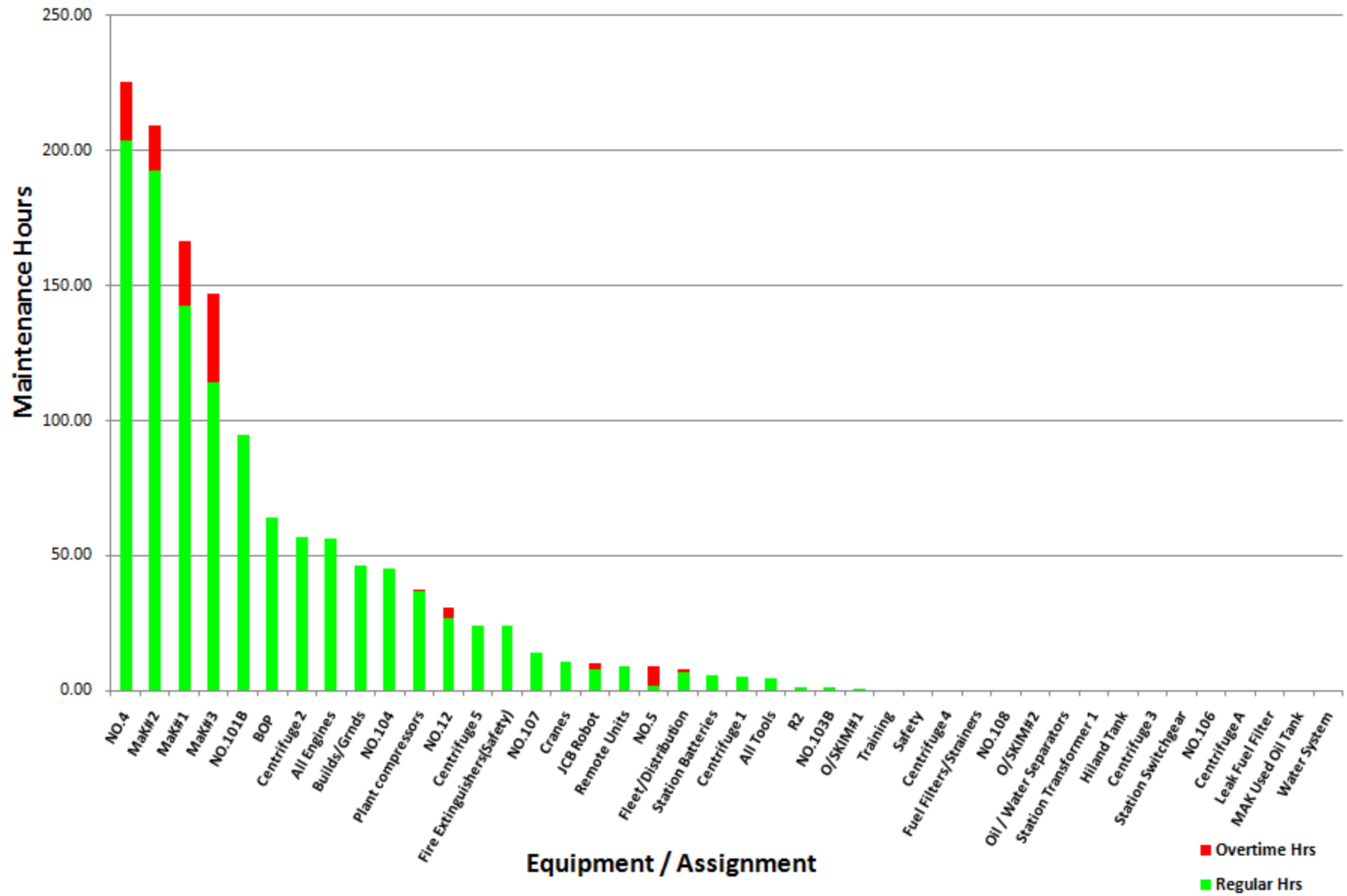
Maintenance Summary Report December 2011

The major activities for the month were planned and corrective maintenance on generating sets and equipment. These included the replacement of faulty air start valves, a damaged cylinder head, turbocharger cartridge and valves on MAK #2, the retorquing of the cylinder head bolts, replacement of valve tappet rollers, a damaged tappet assembly and inspection and service of rocker gear on Wartsila #4, the replacement of the alternator rotor support bearing on Cat #101B and investigations of the cause of high exhaust temperatures on MAK#1. In addition, the 1000 hrs service was carried out on the No.5 Sperre air compressor and the 400 hrs CIP service was done on the No.1 centrifuge. A number of exhaust gas temperature deviations were corrected on Wärtsilä #4 & #5 and on Wartsila #12, a broken cylinder head securing stud was replaced.

Maintenance Activity Summary - December 2011



Regular and Overtime Hours Logged - December 2011



Planned Maintenance Services

The following planned services were completed during the month:

- ◆ Sperre Compressor #5: 1000 hour service
- ◆ Centrifuge #1: 400 hrs CIP Service

Generating Units

Wartsila No. 5: A total of 9 man hours were logged with this unit. The following were the maintenance activities for the month:

- A7 EGT sensor was investigated for malfunctioning and had to be replaced.
- During the month, the B6 fuel pump was replaced at 39,260 hours due to fuel leaks from the tell tale hole.
- Repairs were carried out on the following fuel injectors to correct exhaust temperature deviations.
 - Negative EGT on B7 at 39,421 hrs
 - Negative EGT on B5 & B2 at 39,547 hrs

Wartsila No. 4: A total of 225.5 man hours were logged with this unit. The following were the maintenance activities for the month:

- The cylinder head bolts were checked for proper tension in investigating the cause of combustion gas leakage into the cooling system. The rocker gear were removed and inspected and new parts were fitted where necessary. All the valve tappet rollers were renewed and the camshafts were inspected. Some damage was found at the B9 camshaft section but a replacement was not available and was subsequently ordered. A new tappet assembly was installed at B7 cylinder.
- A damaged tappet assembly was removed and replaced at cylinder A8 of the genset. This occurrence caused an oil spillage from the engine which was cleaned up in the aftermath of the repairs.
- During the month, repairs were carried out on the following fuel injectors to correct exhaust temperature deviation.
 - Negative EGT on B6 at 37,961 hrs
 - Negative EGT on A9 at 38,017 hrs

Wärtsilä No.12: A total of 30.75 man hours were logged with this unit. The maintenance activities carried out were as follows:

- The engine oil was sampled and tested to determine whether or not there was internal water leakage into the oil. The test determined that the oil was good in relation to water content.
- During the month, a broken cylinder head securing stud was replaced on cylinder A2 of the genset.
- Two flexible water hose assemblies were replaced on the HT and LT cooling systems of the engine.

MaK No.1: A total of 166.25 man hours were spent on this unit.

- Investigations were carried out on the fuel control linkages to determine the possible cause of the high exhaust temperatures on the genset. In addition, the fuel injectors were checked out, serviced and refitted to the engine and worn fuel rack control levers were replaced as necessary.
- The fuel injection pumps at cylinders B1 and B2 were inspected and the elements were replaced due to cracking. The elements of both pumps were replaced.
- Inspections were carried out on the nozzle rings of both turbochargers, cylinder leak down tests were done and the A2 and B2 fuel injection pumps were swapped.

- The fuel control linkage which connects both banks of the engine was removed and inspected. The support bushing was replaced because of wear and the shaft, which was also worn, was welded and machined. The fuel pump racks were all set to zero prior to starting of the genset.

MaK No.2: A total of 209.5 man hours were logged with this unit.

- No A2 cylinder head was removed to investigate the air start valve. The valve seat was cut and a new valve was installed to correct the fault condition. The No A3 cylinder head was also removed to replace a faulty air start valve there.
- The B6 cylinder head, piston and liner were removed in the aftermath of a valve failure which resulted in a broken exhaust valve guide and damages to the head, piston and liner. A new liner, new piston fitted with new rings and a serviced cylinder head were fitted to the engine. As a result of the valve failure, the B-Bank turbocharger was damaged and its cartridge assembly was removed and replaced with a refurbished one on hand.
- Cylinder heads Nos. A3 and B1 were removed to effect valve changes to forestall valve failures due to metal fatigue.

MaK No.3: A total of 147 man hours were logged with this unit. The following were the maintenance activities for the month:

- The No.A1 cylinder head was removed to investigate the air start valve which was faulty. The valve seat was also faulty and both components were replaced with new ones.
- The fuel injectors Nos A3, A4, A6 and B4 were removed and inspected due to EGT deviations experienced. The atomization pressures were adjusted from 400 bars to 460 bars and a new nozzle was fitted to the B4 fuel injector.
- The differential pressure gauge on the Boll and Kirch filter was replaced with a new one
- The A3 cylinder head was removed to investigate low exhaust temperatures and one exhaust valve was found broken. Another head was serviced and installed complete with a new air start valve.
- Radiator fan motor A1 was finally removed after the repairs of the overhead hoist. The motor was inspected for the source of the vibration and it was discovered that a bearing spacer on the drive end was damaged. A new spacer will have to be fabricated.
- A leaking expansion joint on the cooling system was replaced with a new one as was necessary during the month.

CAT101B:

- Due to wear on the alternator shaft support bearing, it was removed and replaced by a new bearing.

CAT 104:

- An SEL 551 Relay was installed on the unit as part of the Arc flash risk mitigation. However due to resource constraints, the installation has not been completed.
- The Battery charger was severely damaged and had to be replaced.

CAT 106:

- Exhaust barrel: Work has been cancelled on the exhaust barrel repair and modification in order to perform corrective maintenance on the larger units. However the unit was available.

CAT 107:

- Investigations were carried out on the exhaust temperature thermocouple for cylinder No.1 and low exhaust temperature on cylinder No.2 of the genset.

CAT 108:

- ♦ Unit was available for the entire month of December.

Balance of Plant Auxiliary Units

- A leaking cooling coil on the Ingersoll Rand compressor was repaired by Christopher Calliste.
- The control panel enclosure, buttons and lights for the Hiland tank were replaced.
- Dirty fuel filters were cleaned and serviced as was required during the month.
- A 1000 hour service was carried out on the Sperre #5 air compressor unit
- The installation of the water supply pipe network to Wartsila #4 and #5 expansion tanks was completed.
- The No.1 oil skimmer was inspected and cleaned as was necessary. It was being blocked by debris picked up from the containment area.

Buildings / Grounds / Safety Equipment

- The main gate support structure was modified to allow the gate to be functional. In addition, electrical maintenance was carried out on the actuators for the gate.
- New wire rope and control pendant were installed on the MAK radiator Hoist.
- The Front gate electrical system was serviced during the modification of the gate rails.
- Emergency lights were successfully inspected. Two lights were found defective and would have to be replaced.
- Motors and Sensors in the Plant B tank farm were cleaned and painted.

Station Batteries

- Station Batteries were tested. However all could not be tested because the Bite battery analyzer has been sent for repairs after developing a malfunction.

External Department Assistance / Fleet

- Assistance was rendered to the Fleet garage in diagnosing the derrick trucks which were out of service due to malfunctioning of some of the boom functions of their derricks.
- Repairs were carried out on the starting motor of the JCB Robot to correct a starting fault and the battery was renewed as was necessary.
- Nickson Robertson continued his training assignment at the Fleet Department during the month.

Lube Oil Separators

#1 Separator:

- A 400 hour CIP service was completed at 36 hrs.

#2 Separator:

- The separator was overhauled after an inspection of the unit revealed that the top bearing spindle was loose on the housing. Remedial work was carried out on the housing to correct the looseness of the bearing. The clutch mechanism was serviced and various parts were replaced. After startup, the unit shutdown on vibration sensor fault.

#3 Separator:

- MAK # 3 Centrifuge was investigated for a vibration sensor fault. The Sensor was found to be faulty and had to be disabled on the EPC. A new sensor has been ordered.

#5 Separator:

- The bowl of the separator was inspected and cleaned. The water jets for the water block were all cleaned and the unit was returned to duty.

Remote and Portable Units

Cat 103B & Cat R2

One weekly inspection each was conducted on these remote units. Current hours on these units are:

- Cat 103B: - 19,278 hrs
- R2: - 19,859 hrs

Portable generators

- Portable unit # 5 was prepared and deployed to Foodland Supermarket on the Lagoon Road.

Health & Safety

There was no Health and Safety meeting for the month of December and at the end of the month (and year) the department recorded 1,437 days without a lost time accident.

Lube Oil Quality

Consumption

Data on engine lube oil consumption is listed in the operations section of the report.

Quality

During the month, the oil in Wartsila #4 was completely changed from the Chevron Delo Marine 1000 to the Rubis Total Disola M4015 which has a TBN of 15 versus 12 for the Chevron Delo Marine 1000.

The Rubis oil was also used for topping up of the oil levels in the other large engines except for Wartsila #12 which will be phased in after the depletion of the Chevron oil on hand.

A similar change out of the oil in Wartsila #5 is to be scheduled.

Oil samples were drawn from the large engines and shipped overseas for testing and analysis and the results were reviewed and found to be suitable for further use.

Fuel Quality

The fuel filters and strainers were inspected and cleaned during the month and there were no major issues arising as far as fuel quality was concerned.

Training

- There was no in-house training at the Queens Park Power Plant in December.

SECTION II

QUEEN'S PARK POWER STATION

2.1 QUEEN'S PARK POWER STATION STATISTICS

GRENADA ELECTRICITY SERVICES QUEENS PARK POWER STATION STATISTICS Dec-11

Month	Day In Month	Gross Gen (MWh)	Station Aux. (MWh)	Admin Use	Net Gen. (MWh)	*** Percent (%) Station Use	Fuel Oil Consumed (gals)	Peak Load MW (Prev Year)	Peak Load MW (Pres Year)	* KJ/KG Of Fuel oil Use	**** Plant Heat Rate KJ/kWh	Gross Fuel Effic (kWh/Gal)	Net Fuel Effic (KWh/Gal)	Net Station Efficiency (%)	Load Factor (%)	** Capacity Factor (%)
Jan-11	31	16,214.7	478.1	23,481	15,736.6	2.95%	1,024,437	28.12	27.84	42,400	8,907	15.83	15.36	40.42%	78.28%	44.76%
Feb-11	28	14,535.8	465.1	20,276	14,070.7	3.20%	910,671	29.26	27.18	42,600	8,612	15.96	15.45	41.80%	71.88%	40.13%
Mar-11	31	16,532.9	568.8	23,478	15,955.7	3.44%	1,021,767	30.20	28.72	42,600	8,491	16.18	15.62	42.40%	77.37%	45.64%
Apr-11	30	16,023.6	506.3	22,508	15,544.5	3.16%	994,046	30.83	29.03	42,480	8,507	16.12	15.64	42.32%	74.19%	44.23%
May-11	31	17,010.8	522.6	23,544	16,485.0	3.07%	1,050,602	30.31	30.11	42,480	8,451	16.19	15.69	42.60%	75.93%	46.96%
Jun-11	30	15,924.4	515.5	23,108	15,409.0	3.24%	984,201	29.32	28.78	42,500	8,476	16.18	15.66	42.47%	74.37%	43.96%
Jul-11	31	16,148.8	516.4	23,651	15,632.4	3.20%	995,537	29.34	28.21	42,600	8,454	16.22	15.70	42.58%	76.94%	44.58%
Aug-11	31	17,313.4	535.5	21,842	16,777.9	3.09%	1,075,368	30.14	30.29	42,600	8,558	16.10	15.60	42.07%	76.83%	47.79%
Sep-11	30	16,712.6	514.7	23,407	16,198.0	3.08%	1,035,699	29.67	29.91	42,600	8,465	16.14	15.64	42.53%	75.10%	46.14%
Oct-11	31	16,568.9	499.1	22,954	16,069.8	3.01%	1,023,427	29.90	29.03	42,600	8,584	16.19	15.70	41.94%	76.71%	45.74%
Nov-11	30	16,220.6	481.3	23,594	15,759.3	2.97%	996,693	28.72	29.97	42,600	8,391	16.27	15.81	42.90%	72.75%	44.78%
Dec-11	31	15,736.1	490.6	21,755	15,245.0	3.12%	963,107	27.69	28.94	42,600	8,390	16.27	15.81	42.90%	72.75%	43.44%
Total		194,942.6	6,094.0	273,598	188,883.9		12,075,555									
Average		16,245.2	507.8	22,800	15,740.3	3.13%	1,006,296	29.46	29.00	42,555	8,524	16.14	15.64	42.24%	75.26%	44.84%
Max		17,313.4	568.8	23,651	16,777.9	3.44%	1,075,368	30.83	30.29	42,600	8,907	16.27	15.81	42.90%	78.28%	47.79%

Density Figure obtained from Texaco - 0.8542 KG/L

Colorific Heat Value of fuel obtained from Texaco - 42600 KJ/KG

Net Station Efficiency = 3600/Net Plant Heat Rate

** Capacity Factor = Gross Generation (kWh) / Station Available Capacity x Hours per month

*** Percentage Station Use = Total Auxiliary / Gross Generation

**** Plant Heat Rate = Conversion from Liters to Gallons changed to 3.7854

2.2 QUEEN'S PARK ENGINE SUMMARY

December 2011

Engine No.	Online Hours	Standby Hours	Forced Hours	Planned Hours	Units Gen. (MWh)	Fuel Con. (US gals)	On line Hours (%)	Percent Avail. (%)	Forced Rate (%)	Planned Rate (%)	Capacity Factor (%)	Heat Rate (KJ/kWh)	Fuel Effic. (Units)
Cat.101B	32.5	601.8	0.0	109.6	53.4	3,662.0	4.4	85.3	0.0	14.7	0.00	9492	14.58
Cat. 104	6.8	581.7	120.0	35.6			0.9	79.1	16.1	4.8	0.00		
Cat. 106	14.2	729.8	0.0	0.0			1.9	100.0	0.0	0.0			
Cat. 107	145.9	598.1	0.0	0.0	407.6	26,899.0	19.6	100.0	0.0	0.0	0.00	9134	15.15
Cat. 108	213.4	530.6	0.0	0.0			28.7	100.0	0.0	0.0	0.00		
MaK 1	462.8	184.9	12.1	84.2	1,903.0	117,136.8	62.2	87.0	1.6	11.3	0.00	8520	16.24
MaK 2	397.4	34.8	306.1	5.8	1,677.0	101,413.1	53.4	58.1	41.1	0.8	0.00	8370	16.54
MaK 3	626.2	13.1	89.0	15.7	3,584.0	218,547.9	84.2	85.9	12.0	2.1	0.00	8440	16.4
Wart 4	416.1	247.1	6.5	74.3	2,593.1	156,705.0	55.9	89.1	0.9	10.0	0.00	8365	16.55
Wart 5	674.1	61.7	7.2	1.0	4,623.1	279,732.2	90.6	98.9	1.0	0.1	0.00	8375	16.53
Vaasa 12	229.5	501.8	8.7	4.1	894.9	59,011.0	30.8	98.3	1.2	0.5	0.00	9127	15.16
Cat. 103	0	744.0	0.0	0.0	0.0	0.0	0.0	100.0	0.0	0.0	#DIV/0!	#DIV/0!	0
Cat. R2	0	744.0	0.0	0.0	0.0	0.0	0.0	100.0	0.0	0.0	#DIV/0!	#DIV/0!	0
Totals/Avg.	3218.97	5573.3	549.54	330.15	15736.12	963107.00	33.3	90.9	5.7	3.4	#DIV/0!	8471	16.3

2.3 QUEEN'S PARK LUBE OIL STATUS

DECEMBER 2011

Engine No.	Make-Up	Oil Change	Usage Rate (g/kWh)	Average Usage Rate (g/kWh)	Texaco Taro	Texaco URSA Super Plus 15W40
Cat. 101B	0	0				0
Cat. 103B	0	0				0
Cat. 104	0	0				0
Cat. 106	0	0				0
Cat. 107	0	0				0
Cat. 108	6	0				6
Cat R2		0				0
Vaasa 12	117.60	0		0.65	117.60	
MaK 1	61.55	0		0.55	61.55	
MaK 2	541.28	0		0.55	541.28	
MaK 3	478.15	0		0.55	478.15	
Wart 4	239.61	1340.14		0.43	1579.75	
Wart 5	563.79	0		0.43	563.79	
Totals	2007.98		5.28	3.16	3342.12	6

2.4 QUEEN'S PARK FUEL DATA

Month	Petrocaribe Fuel Received (US Gals)	Fuel Used (US Gals)	Percent Difference
January	972,297	1,024,437	5.09
February	876,827	910,671	3.72
March	1,028,154	1,021,767	-0.63
April	1,001,316	994,046	-0.73
May	1,067,792	1,050,602	-1.64
June	997,901	984,201	-1.39
July	1,009,062	995,537	-1.36
August	1,095,407	1,075,368	-1.86
September	1,051,120	1,035,699	-1.49
October	1,038,726	1,023,427	-1.49
November	988,639	996,693	0.81
December	1,018,958	963,107	-5.80

$$\text{Percent difference} = \frac{\text{Fuel Used} - \text{Petrocaribe Fuel Received}}{\text{Fuel Used}} * 100$$

SECTION III

CARRIACOU POWER STATION

3.1 CARRIACOU POWER STATION STATISTICS

GRENADA ELECTRICITY SERVICES CARRIACOU POWER STATION STATISTICS Dec-11

Month	Day In Month	Gross Gen (KWh)	Station Aux. (kWh)	Net Gen. (kWh)	*** Percent (%) Station	Fuel Oil Consumed (gals)	Peak Load KW (Prev Year)	Peak Load KW (Pres Year)	* KJ/KG Of Fuel oil Use	**** Plant Heat Rate KJ/kWh	Gross Fuel Effic (kWh/Gal)	Net Fuel Effic (KWh/Gal)	Net Station Efficiency (%)	Load Factor (%)	** Capacity Factor (%)
Jan-11	31	691,192	19,803	671,389	2.87%	43,885	1215	1268	42,460	8,697	15.75	15.30	41.39%	73.27%	48.39%
Feb-11	28	603,479	17,015	586,464	2.82%	38,664	1252	1266	42,460	8,783	15.61	15.17	40.99%	70.93%	46.77%
Mar-11	31	680,503	18,647	661,856	2.74%	43,643	1222	1280	42,600	8,898	15.59	15.17	40.46%	71.46%	47.64%
Apr-11	30	652,636	18,504	634,132	2.84%	42,040	1250	1234	42,480	8,823	15.52	15.08	40.80%	73.46%	47.21%
May-11	31	707,407	19,767	687,640	2.79%	45,705	1216	1299	42,480	8,849	15.48	15.05	40.68%	73.46%	47.21%
Jun-11	30	674,368	19,830	654,533	2.94%	44,121	1193	1235	42,500	9,078	15.28	14.83	39.66%	73.46%	47.21%
Jul-11	31	705,296	20,763	684,533	2.94%	46,116	1309	1340	42,600	9,072	15.29	14.84	39.68%	70.74%	49.37%
Aug-11	31	716,061	20,478	695,583	2.86%	46,676	1276	1285	42,480	9,044	15.34	14.90	39.81%	74.90%	50.13%
Sep-11	30	684,174	17,820	666,354	2.60%	43,369	1272	1275	42,280	8,795	15.78	15.36	40.93%	74.53%	49.49%
Oct-11	31	699,184	16,910	682,274	2.42%	44,888	1190	1279	42,280	8,908	15.58	15.20	40.41%	73.48%	48.95%
Nov-11	30	679,479	11,649	667,830	1.71%	48,023	1220	1258	42,280	9,806	14.15	13.91	36.71%	75.02%	49.15%
Dec-11	31	704,836	8,264	696,572	1.17%	51,686	1310	1300	42,280	10,174	13.64	13.48	35.38%	72.87%	49.34%
Total		8,198,615	209,450	7,989,160		538,816									
Average		683,218	17,454	665,763	2.56%	44,901	1244	1277	42,432	9,077	15.25	14.86	39.74%	73.13%	48.41%
Max		716,061	20,763	696,572	2.94%	51,686	1310	1340	42,600	10,174	15.78	15.36	41.39%	75.02%	50.13%

Density Figure obtained from Texaco - 0.8509KG/L

Colorific Heat Value of fuel obtained from Texaco - 42,280KJ/KG

Net Station Efficiency = 3600/Net Plant Heat Rate

** Capacity Factor = Gross Generation (kWh) / Station Available Capacity x Hours per month

*** Percentage Station Use = Total Auxiliary / Gross Generation

**** Plant Heat Rate = Conversion from Liters to Gallons changed to 3.7854

3.2 CARRIACOU ENGINE SUMMARY

DECEMBER 2011

Engine No.	On – Line Hours	Stand-By Hours	Forced Hours	Planned Hours	Units Gen. (kWh)	Fuel Con. (US gals)	Hours Online (%)	Percent Avail.	Forced Rate (%)	Planned Rate (%)	(%) Station Use	Capacity Factor (%)	Heat Rate (KJ/KG)	Fuel Effic. (kWh)	Effic. (%)
1	11	733	0.0	0.0	4381	277.2	1.5	100	0.0	0.0	0.7	27.9	8790.4	15.8	41
2	11	733	0.0	0.0	4280	288.0	1.5	100	0.0	0.0	0.7	27.3	9348.4	14.9	38.5
3	0.0	0.0	744	0.0	0.0	0.0	0.0	0.0	100	0.0	0.0	0.0	0.0	0.0	0.0
Cat 105	734	5	0	5	696175	51120.3	98.7	99.3	0	0.7	3.8	789.3	3123.31	13.6	109.7

3.3 CARRIACOU LUBE OIL STATUS

DECEMBER 2011

Engine No.	Make- up	Oil Change	Usage Rate (%)	Shell Rimula X15 W40
1	0	0	0	0
2	0	0	0	0
3	0	0	0	0
CAT105	19	110	0.09	129
TOTAL	19	110	0.09	129

3.4 CARRIACOU FUEL DATA

Month	Shell Fuel Received (US Gals)	Fuel Used (US Gals)	Percent Difference
January	47,280	43,885	-7.74
February	39,600	38,664	-2.42
March	47,094	43,643	-7.90
April	44,880	42,040	-0.06
May	48,000	45,705	-0.05
June	45,840	44,121	-3.90
July	45,360	46,116	1.64
August	48,000	46,676	-2.83
September	49,920	43,369	-15.11 ¹
October	48,000	44,888	-6.93
November	48,000	48,023	0.05
December	51,240	51,686	0.86
TOTAL	563,214	538,816	

$$\text{Percent difference} = \frac{\text{Fuel Used} - \text{Fuel Received} * 100}{\text{Fuel Used}}$$

¹ Fuel received at the end of the month leading to such a large variance.

SECTION IV

PETITE MARTINIQUE POWER STATION

4.1 PETITE MARTINIQUE POWER STATION STATISTICS

GRENADA ELECTRICITY SERVICES PETIT MARTINIQUE POWER STATION STATISTICS Nov-11

Month	Day In Month	Gross Gen (KWh)	Station Aux. (kWh)	Net Gen. (kWh)	*** Percent (%) Station	Fuel Oil Consumed (gals)	Peak Load KW (Prev Year)	Peak Load KW (Pres Year)	* KJ/KG Of Fuel oil Use	**** Plant Heat Rate KJ/kWh	Gross Fuel Effic (kWh/Gal)	Net Fuel Effic (KWh/Gal)	Net Station Efficiency (%)	Load Factor (%)
Jan-11	31	68,543	1,914	66,629	2.79%	5,196	131	139	42,460	10,541	13.19	12.82	34.15%	66.28%
Feb-11	28	58,521	1,789	56,732	3.06%	4,840	130	131	42,460	11,363	12.09	11.72	31.68%	66.48%
Mar-11	31	68,715	2,692	66,023	3.92%	6,030	141	139	42,600	12,202	11.40	10.95	29.50%	59.59%
Apr-11	30	68,203	3,381	64,822	4.96%	5,672	151	137	42,480	11,415	12.02	11.43	31.54%	69.14%
May-11	31	71,815	3,864	67,951	5.38%	7,879	117	137	42,480	15,060	9.11	8.62	23.90%	69.14%
Jun-11	30	69,778	3,470	66,308	4.97%	5,887	138	144	42,500	11,731	11.85	11.26	30.69%	67.30%
Jul-11	31	69,974	3,691	66,283	5.27%	6,143	135	135	42,600	12,079	11.39	10.79	29.80%	67.67%
Aug-11	31	68,413	2,662	65,751	3.89%	5,570	136	133	42,600	11,202	12.28	11.80	32.14%	69.14%
Sep-11	30	71,280	3,185	68,095	4.47%	5,807	131	140	42,600	11,189	12.27	11.73	32.17%	70.71%
Oct-11	31	74,245	3,516	70,729	4.74%	6,242	146	145	42,600	11,690	11.89	11.33	30.80%	68.82%
Nov-11	30	69,651	3,292	66,359	4.73%	5,883	142	151	42,840	11,572	11.84	11.28	31.11%	
Dec-11	31	71,253	4,535	66,718	6.36%	6,325	152	148	42,840	11,572	11.27	10.55	31.11%	
Total		830,391	37,991	792,400		71,474								
Average		69,199	3,166	66,033	4.54%	5,956	138	140	42,588	11,801	11.72	11.19	30.72%	67.43%
Max		74,245	4,535	70,729	6.36%	7,879	152	151	42,840	15,060	13.19	12.82	34.15%	70.71%

Density Figure obtained from Texaco - 0.8509 KG/L

Colorific Heat Value of fuel obtained from Texaco - 42280 KJ/KG

Net Station Efficiency = 3600/Net Plant Heat Rate

** Capacity Factor = Gross Generation (kWh) / Station Available Capacity x Hours per month

*** Percentage Station Use = Total Auxiliary / Gross Generation

**** Plant Heat Rate = Conversion from Liters to Gallons changed to 3.7854

4.2 PETITE MARTINIQUE ENGINE SUMMARY

DECEMBER 2011

Engine No.	On – Line Hours	Standby Hours	Forced Hours	Planned Hours	Units Gen. (kWh)	Fuel Con. (US gals)	On-line Hours (%)	Percent Avail.	Forced Rate (%)	Planned Rate (%)	(%) Station Use	Capacity Factor (%)	Heat Rate (KJ/KG)	Fuel Effic. (kWh)	Effic. (%)
Lister 1	725	19	0.0	0.0	69402.0	6179.5	97.4	100	0.0	0.0	0.4	36.7	40743.0	11.2	8.8
Cat. 2	19	723	0.0	2.0	1851.0	145.2	2.6	99.7	0.0	0.3	0.2	37.3	33655.9	13.7	10.8

4.3 PETITE MARTINIQUE LUBE OIL STATUS

DECEMBER 2011

Engine No.	Make-Up	Oil Change	Usage Rate (%)	Texaco URSA Super Plus X 15 W 40
Lister 1	31.0	0.0	1.5	31.0
Cat. 2	0.0	10.0	0.0	10.0
TOTAL	31	10	1.50	41

4.4 PETITE MARTINIQUE FUEL DATA

Month	Fuel Received (US Gals)	Fuel Used (US Gals)	Percent Difference
January	7,174	5,196	27.6
February	6,029	4,840	-24.6
March	5,731	6,030	4.96
April	7,511	5,672	-0.32
May	5,893	7,879	0.25
June	5,442	5,887	0.08
July	7,420	6,143	-20.78
August	5,497	5,570	1.31
September	5,063	5,807	0.14
October	8,130	6,242	0.28
November	5,096	5,883	13.38
December	8,690	6,325	-37.39
TOTAL	77,676	71,474	

$$\text{Percent difference} = \frac{\text{Fuel Used} - \text{Texaco Fuel Received} * 100}{\text{Fuel Used}}$$

SECTION V

FLEET DEPARTMENT

5.1 FLEET STATISTICS

In December 2011, we were able to solve some of the long standing problems with the Derricks. We saw the return to operation of both SL93 and SL218 (Grenada) and SL217 (Carriacou).

This month we had one addition to our fleet PAF347 a Kia Sorento which will be used by Mr. Benedict Brathwaite.

Table 1: Fleet Scorecard

	October	November	December
Overall Availability	92.67	90.98	92.57
Large Vehicle Availability (SL)	76.25	77.13	86.80
Total Miles Travelled			
Number of Vehicle Accidents	2	2	2
Number of Breakdowns	2	2	0
Personnel Injuries	0	0	0
Average Vehicles Washed/Day	10.88	10.23	9.96

5.2 VEHICLE STATUS:

Digger Derricks:

SL218

This Derrick returned to service this month.

Bucket Trucks:

SL93

This Derrick returned to service this month but was taken off service to repair and repaint its body.

SL210

This vehicle was serviced replacing gearbox and rear diff oil.

Pole Truck:

Both vehicles were available during the month.

Utility Trucks:

Light Trucks & SUV's:

TZ883

The clutch and related parts of this vehicle was replaced by Steels Auto Supplies.

TAA676

This vehicle was serviced. The front brakes were replaced together with the front & rear differential oil, the transfer box oil and the automatic transmission fluid was replaced. This vehicle was sent to Gleans garage the following day to replace the timing belt.

VEHICLE SERVICES:

PAF 97
PAA 288
TAA 676
SL 210
5,000 MILE

TYRE SERVICES:

Tire Repairs	Equipment	No. of Tires
	TV 365	1
	TO440	1
	SL82	1
	P7730	1
Tire Replacement	SL95	2
	TAC292	2

VEHICLE BREAKDOWNS:

There were no break-downs this month.

VEHICULAR ACCIDENTS:

There were two reported accidents this month.

VEHICLE WASHING:

Vehicle washing during the month proceeded as normal with 249 vehicles washed averaging 9.96 vehicles washed per day at a cost of \$6810.00.

PERSONNEL:

There were no personnel accidents for the month.

- Fleet Mechanic Kevin Da Breo had one sick day and 2.5 days strike.
- Fleet Mechanic Nickson Robertson had one sick day and 2.5 days strike.
- Fleet Mechanic Leroy Gilbert took his annual vacation leave from Dec 2011 to Feb 2012.

CARRIACOU& PETITE MARTINIQUE:

- TAE164, a Toyota Hilux pick-up had major engine damage which accrued in July. Steeles Auto Supplies has finally decided to repair the engine. They estimated the job to be completed by the end of January 2012.

APPENDICES

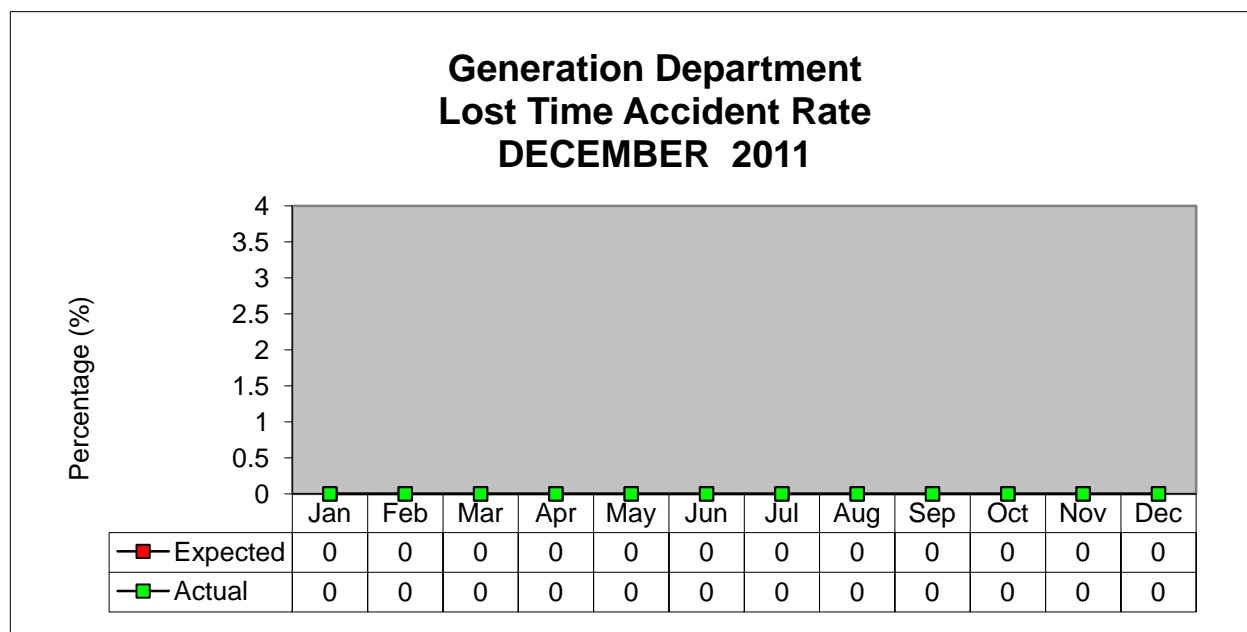


Figure (iii) - Lost Time Accident

Lost days/Person days worked * 100

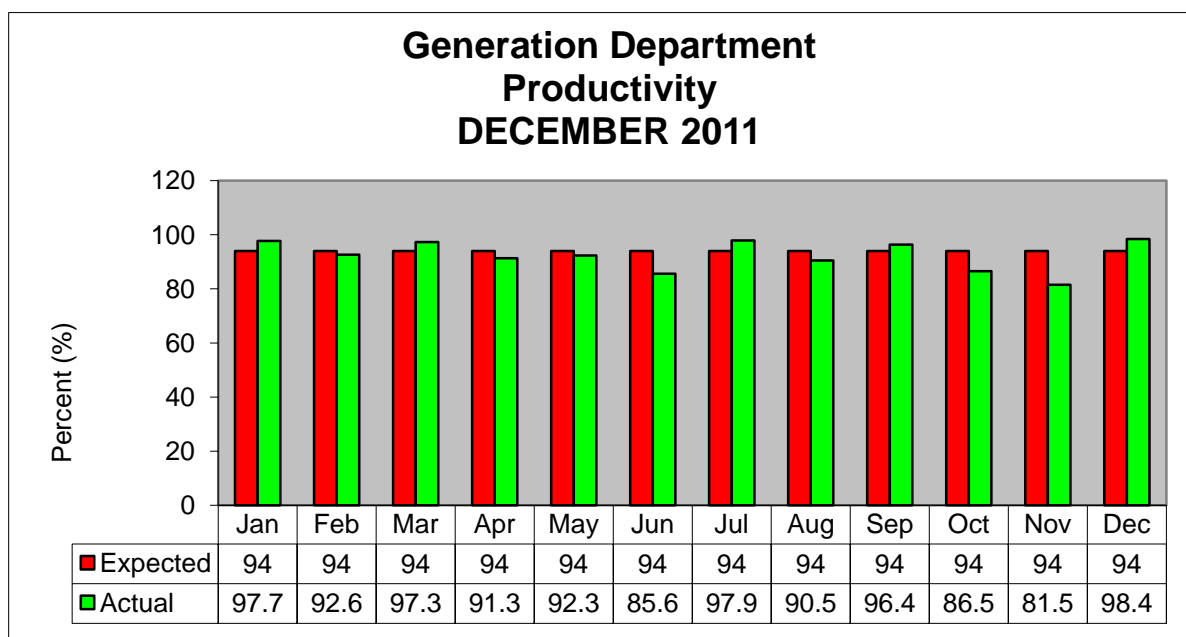


Figure (iv) - Productivity

Hours worked from Work Order/Total Attendance hours * 100

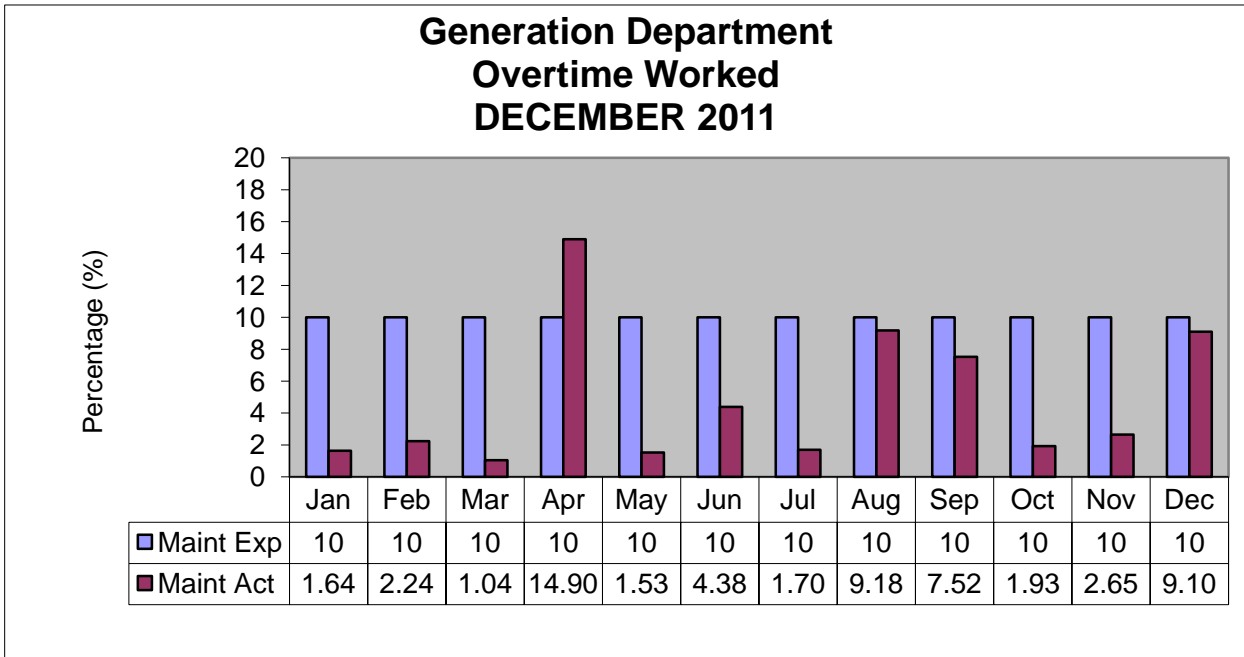


Figure (v) - Overtime Worked

Total overtime worked/total hours worked * 100

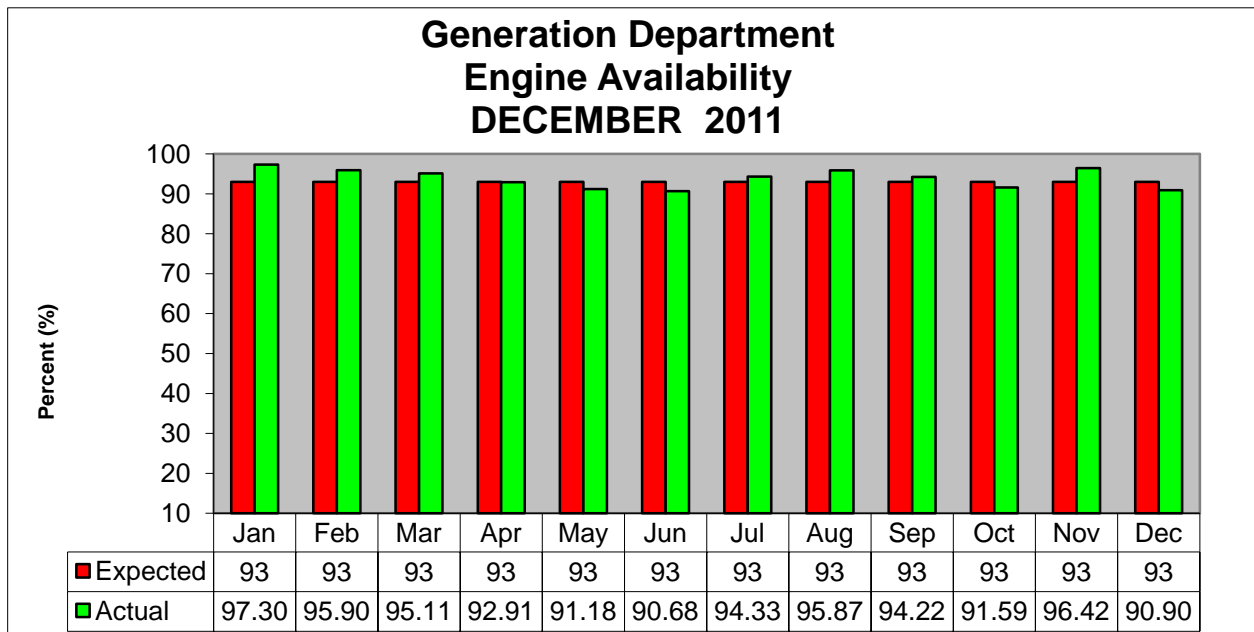


Figure (vi) - Engine Availability

Rated Output Capacity/ Installed Output Capacity * Percent Availability

Generation Department Forced Outage Rate DECEMBER 2011

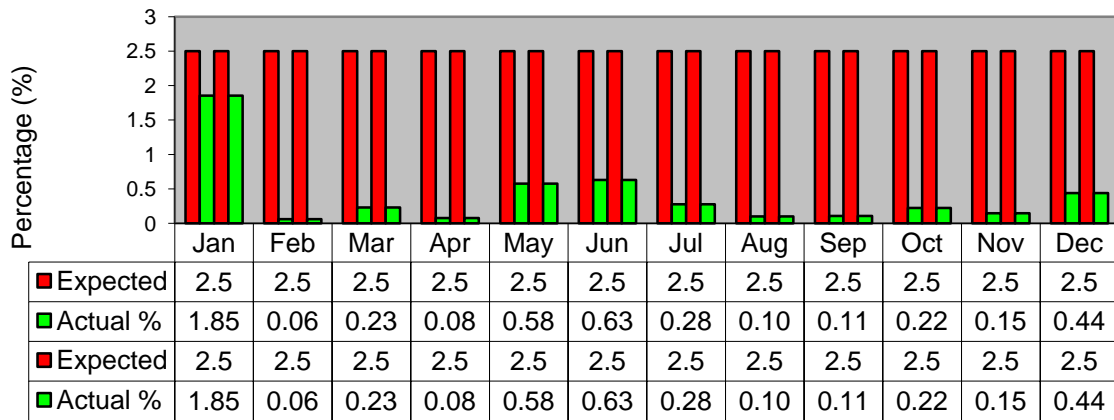


Figure (vii) - Forced Outage Rate

Total Percentage Forced Outage of all engines/ No. of Engines

Generation Department Planned Outage Rate DECEMBER 2011

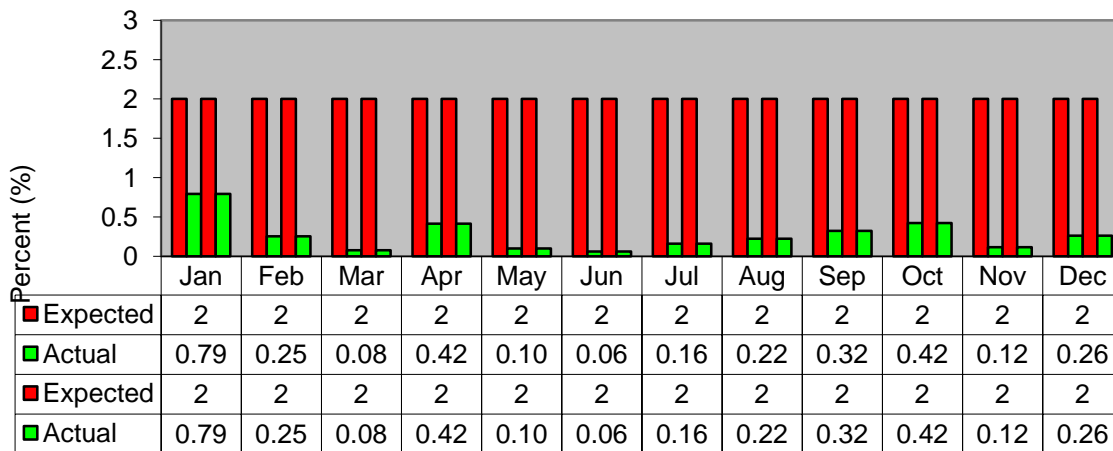


Figure (viii) - Planned Outage Rate

Total Percentage Planned Outage of all engines/ No of Engines

Generation Department Work Order Completion Rate DECEMBER 2011

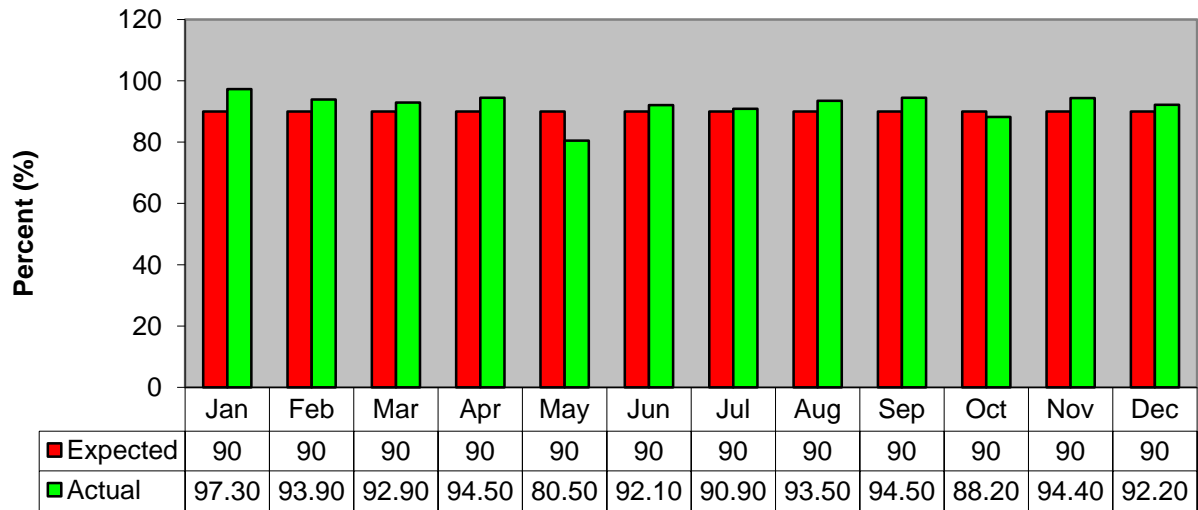


Figure (ix) - Work Order Completion Rate

Works Order Closed/Works Order Open * 100

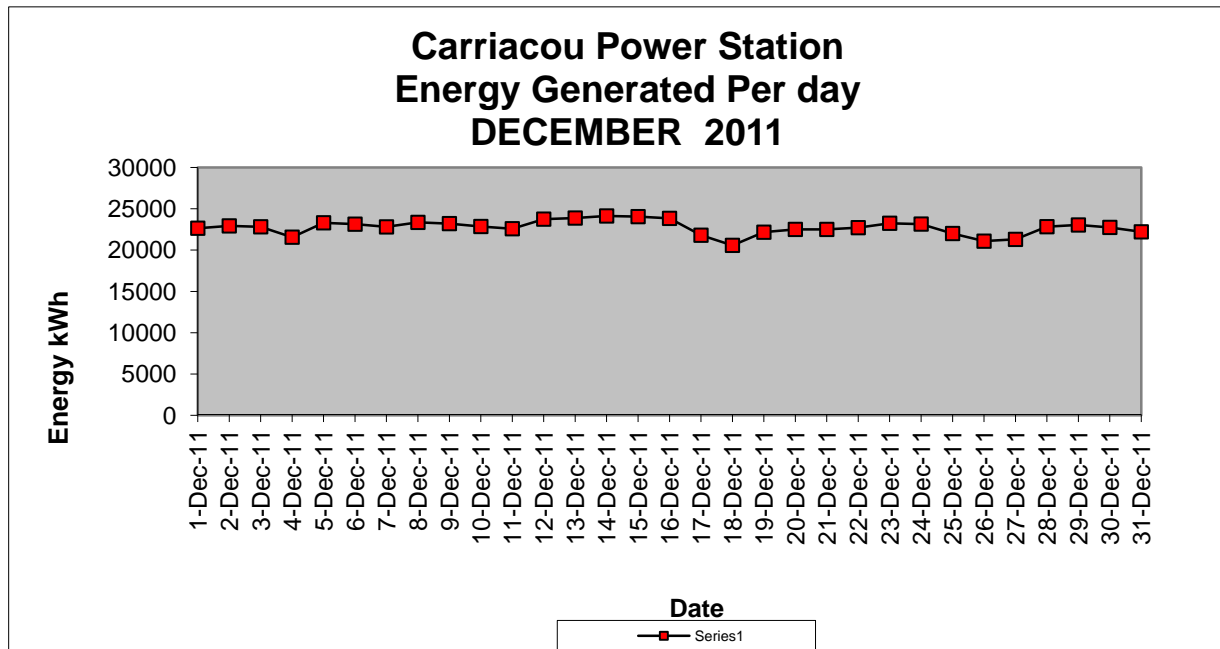


Figure (i) – Energy Generated

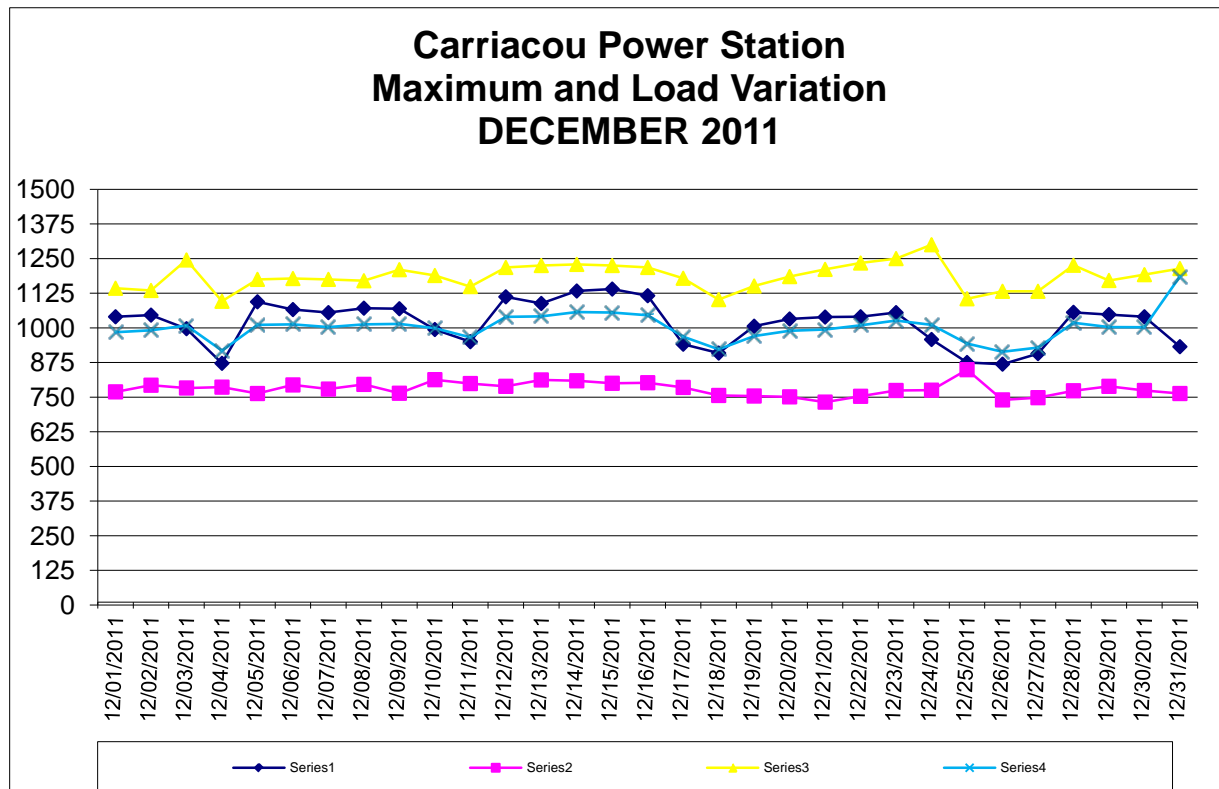


Figure (ii) – Load Variation

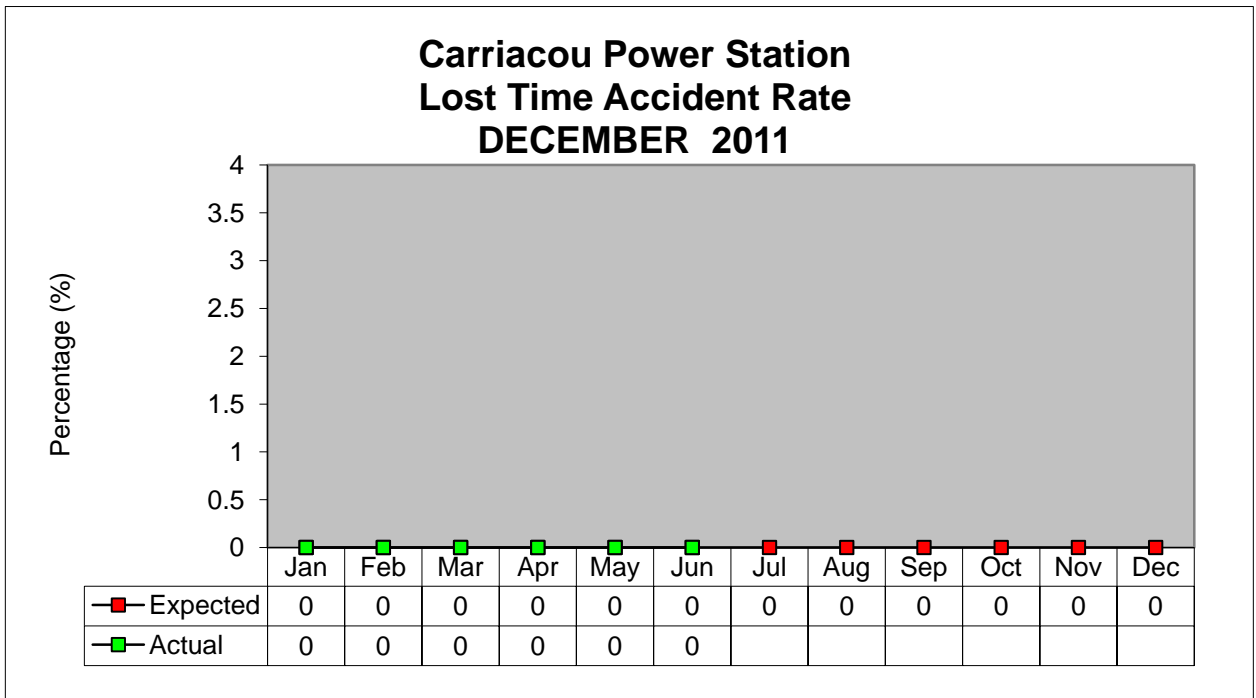


Figure (iii) - Lost Time Accident

Lost days/Person days worked * 100

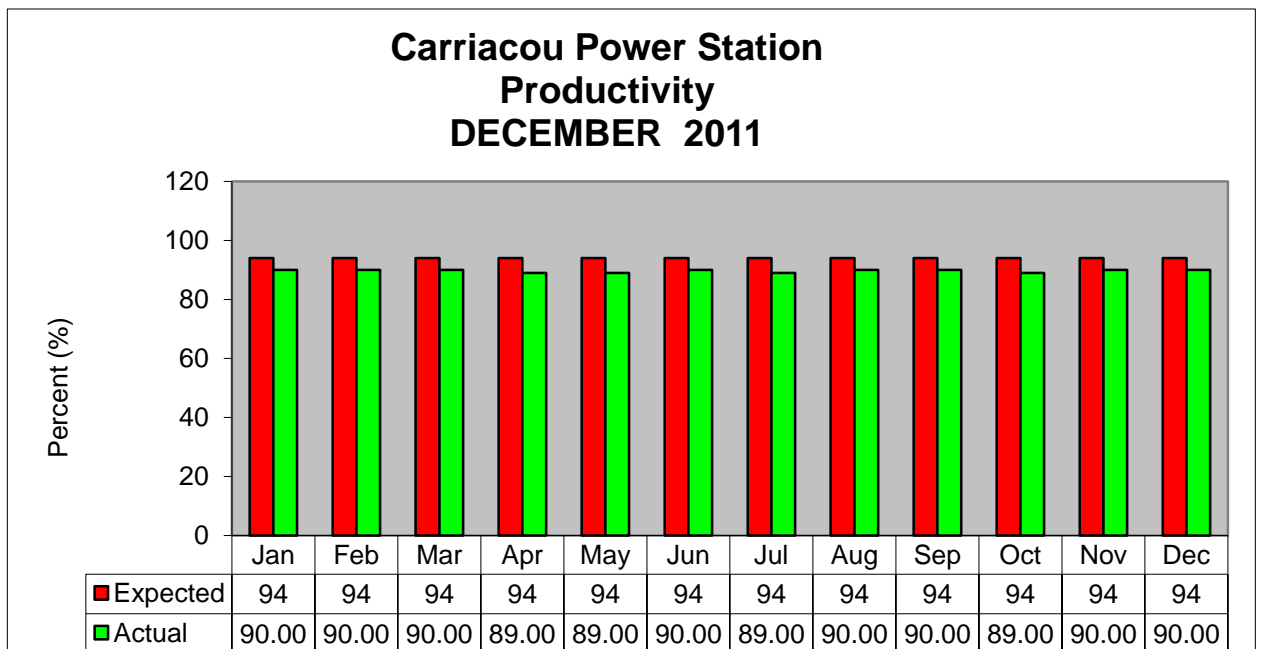


Figure (iv) - Productivity

Hours worked from Work Order/Total paid hours*

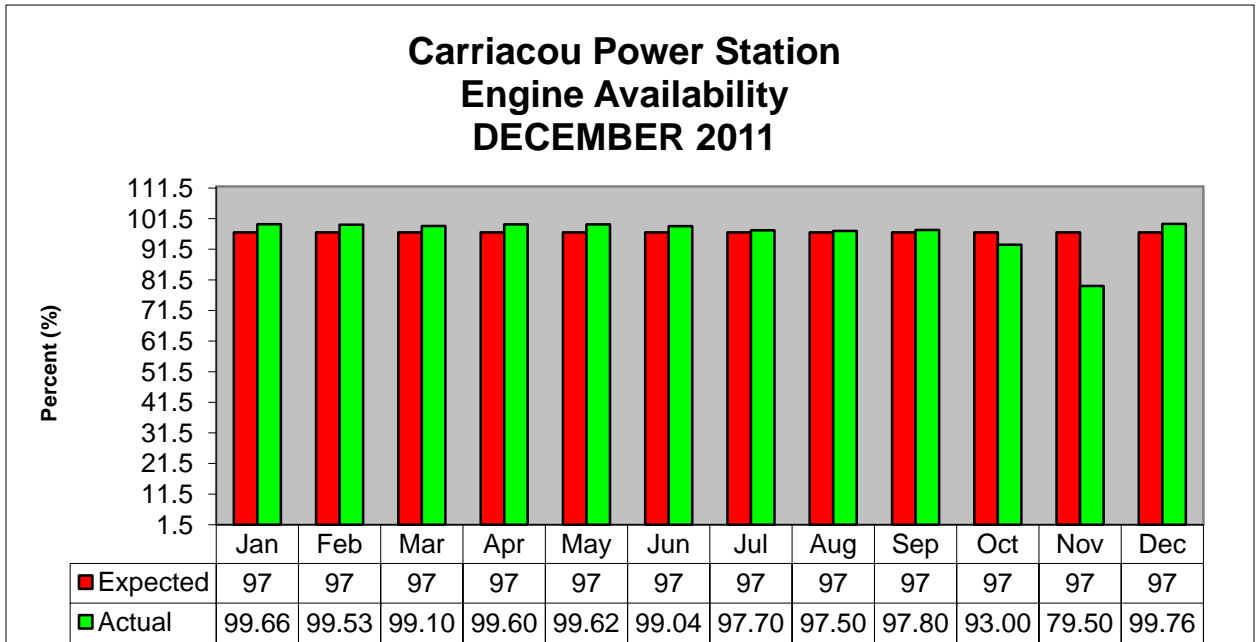


Figure (v) – Plant Availability

Availability of all engines/No of engines* 100

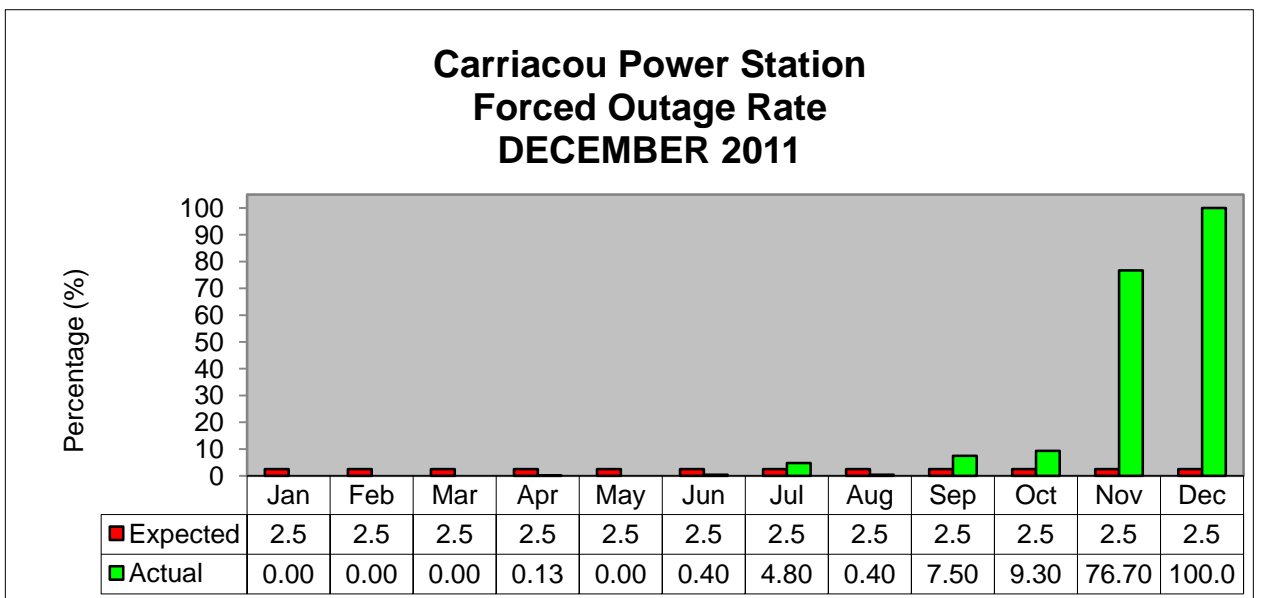


Figure (vi) - Forced Outage Rate

Total force outage of all engines/No. of engines* 10

Carriacou Power Station Planned Outage DECEMBER 2011

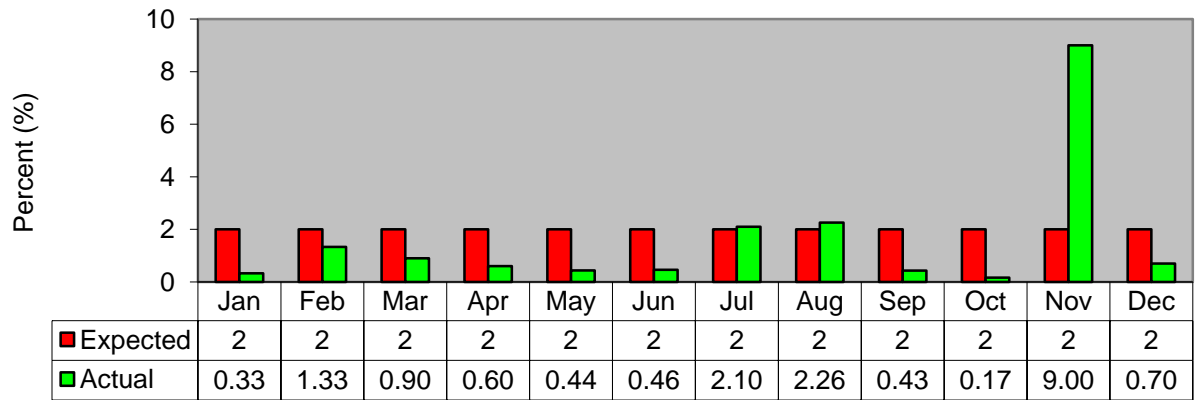


Figure (vii) - Planned Outage Rate

Total Planned outage of all engines/ No of engines x 100

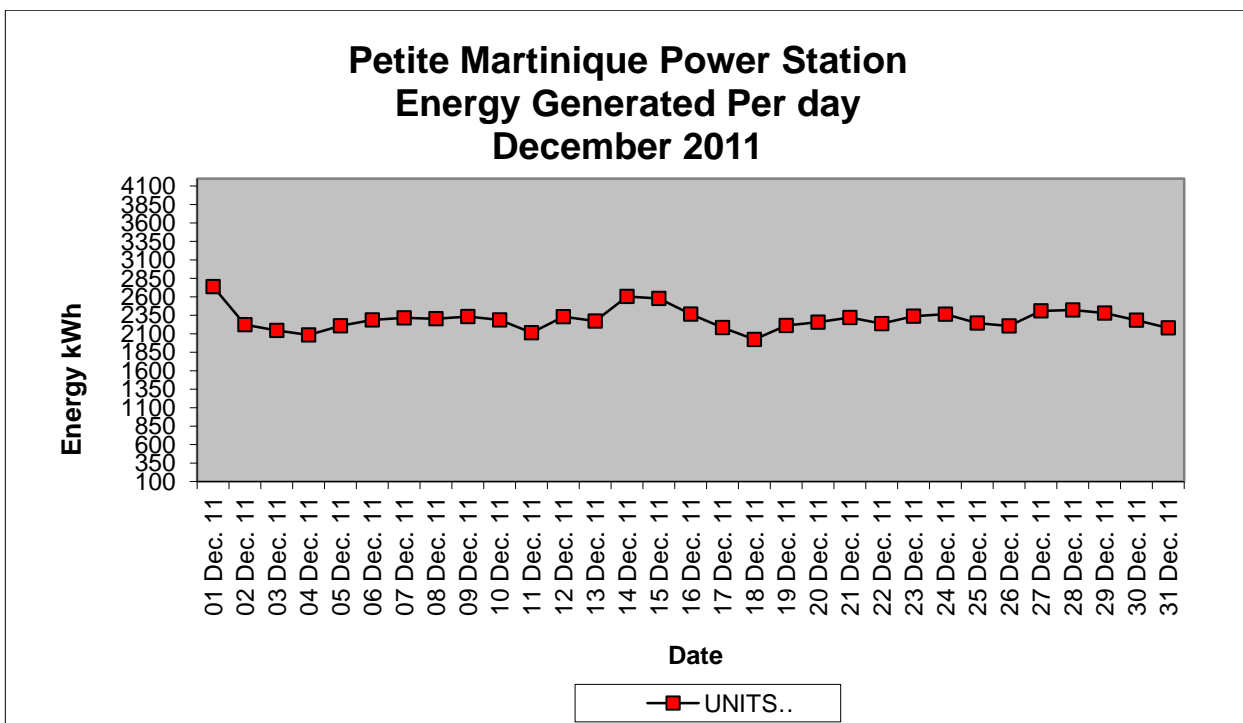


Figure (I) - Energy Generated

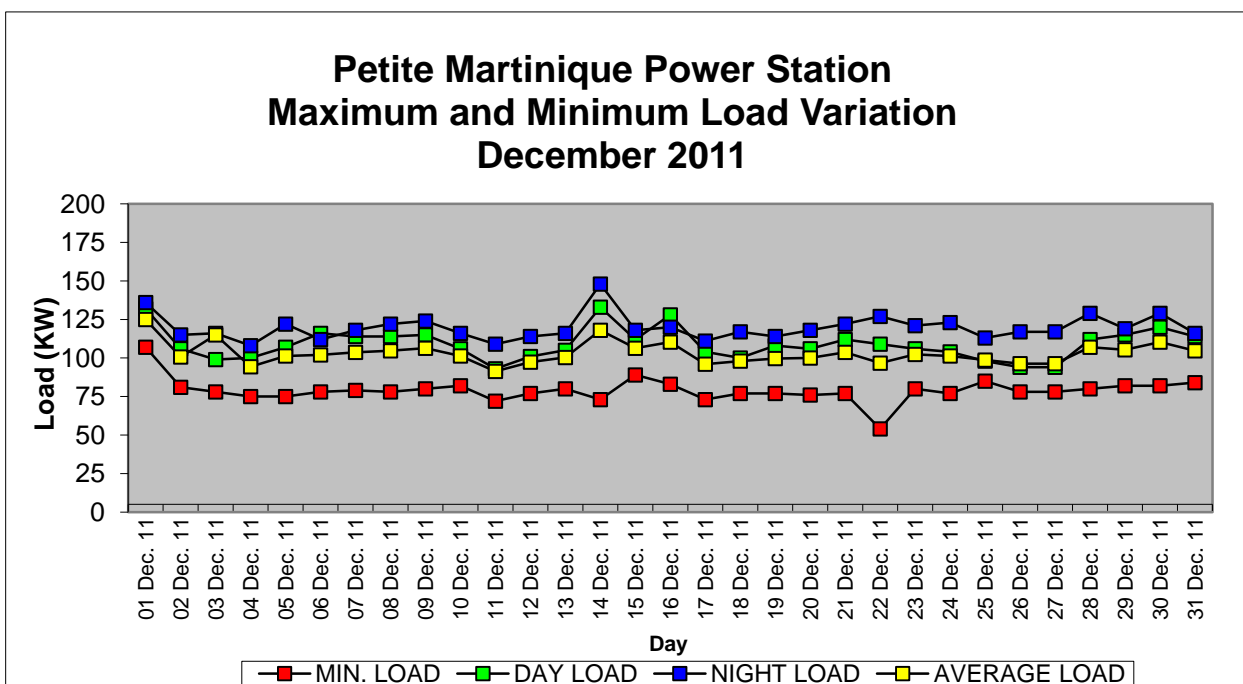


Figure (II) - Load Variation