

GRENADA ELECTRICITY SERVICES LTD

Monthly Report for the Generation Department

DECEMBER 2010

	Gen Gross (kWh)	Gen Net (kWh)	Peak Load (kW)	Fuel Oil Received (U.S gal)	Heat Rate (KJ/kWh)	Lube Oil Used Make up (U.S gal)	Lube Oil Consumption (g/kWh)
Petite Martinique	69,799	67,826	152	7,174	11,893	21	1.03
Carriacou	717,564	696,930	1,310	52,440	8,826	22	0.10
Queens Park SGU (103B & R2)	16,249,349	15,672,900	28,940	1,018,946	9,229	2,296	0.48
	-	-	2,663	-			
Fuel Used							
Vehicles Usage QP/Fleet (US gal)			3,346				
Vehicles C & PM (U.S. gal)			169				
Oil on Hand	Taro 12XD40 (US gals) Plant A	Taro 12XD40 US (gals) Plant B	Taro 12XD40 US (gals) Drums	Texaco URSA Super Plus 15W40 (U.S gals)			
Queens Park	1,938	653	-	1,540			
Carriacou				330			
Petite Martinique				338			

Administrative Use (Metered): Production Dept. –	24,205 kWh
Administrative Use (Metered): Carriacou – T& D Building -	917 kWh
Office Building -	1,008 kWh
Administrative Use (Metered): Petite Martinique - Engine Hall	1,109 kWh

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SECTION I: GRENADA / CARRIACOU & PETITE MARTINIQUE

1. GENERATION SUMMARY

1.1 EXECUTIVE SUMMARY (January to December)

Station	Peak Load (KW)	Peak Load % vs '09	Gross Gen (kWh)	Gross Gen % vs '09	Engine Availability (%)			Gross Fuel Efficiency (kWh/USG)			Forced Outage Rate (%)		
					Tar	2010	2009	Tar	2010	2009	Tar	2010	2009
Queen's Park	30,830	6.99%	199,617,368	2.75%	90	92.4	86.6	16.30	16.2	16.4	2.4	3.9	7.2
Carriacou	1,310	3.39%	8,269,100	4.08%	95	99.6	87.6	14.50	14.9	14.7	2.4	5.3	8.0
Petite Martinique	151	3.42%	816,248	6.88%	95	99.6	95.1	11.00	11.7	12.0	3	0.0	0.0

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

UNIT DESIGNATION	Installed Capacity (kW)	Gross Gen (KWh) 2010	Gross Gen (KWh) 2009	Engine Availability (%)			Gross Fuel Eff. (kWh/USG)			Forced Outage Rate (%)		
				Tar	2010	2009	Tar	2010	2009	Tar	2010	2009
MAK 1	5,500	25,528,164	25,148,482	90	97.5	74.5	16.5	16.25	16.41	2.4	2.2	24.5
MAK 2	5,500	24,149,750	20,220,500	90	96.8	88.2	16.3	16.39	16.35	2.4	2.4	0.4
MAK 3	7,450	40,048,036	47,466,216	95	82.4	97.2	16.5	16.60	16.51	2.4	4.4	1.0
WARTSILA 4	8,000	49,113,775	41,200,667	85	94.8	87.7	16.7	16.26	16.42	2.4	3.3	3.9
WARTSILA 5	8,000	47,397,368	37,564,003	85	92.6	75.8	16.7	16.30	16.42	2.4	4.9	12.8
WARTSILA 12	5,000	9,044,000	15,419,000	90	94.5	88.2	15.7	14.86	17.08	2.4	1.8	4.6
CAT 3500's	9,240	4,336,276	7,260,410	90	87.9	94.5	14.5	14.83	14.01	2.4	8.3	3.1
TOTAL	48,690	199,617,368	194,279,278	90	92.4	86.6	16.3	16.22	16.44	2.4	3.9	7.2

1.3 GENERATION PERFORMANCE vs. PERFORMANCE TARGETS

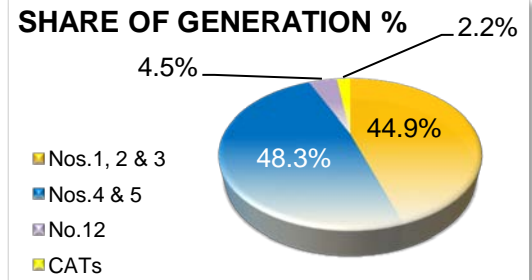
PERFORMANCE INDICATORS	TARGET	2006	2007	2008	2009	2010	TRAFFIC LIGHT
System Load Factor (%)	> 74%	71.28	84.23	70.39	70.36	71.64	
Generation Reserve Margin (%)	>50%	103.19	78.88	65.47	59.54	57.61	
Plant Energy Consumption (%)	< 3.4%	3.28	3.39	3.27	3.38	3.08	
Utilization Factor (%)	< 45%	37.27	40.59	42.85	45.64	46.90	
Generation Non-Served Energy (%)	0.02%	0.04	0.01	0.02	0.02	0.02	
Fuel Efficiency (kWh/USG)	16.30	16.39	16.38	16.27	16.34	16.06	
Incident Rate (incidents per 100 employees.)	0.0	0.0	0.20	0.03	0.00	0.00	
Engine Availability (%)	90%	86.9	86.1	87.3	86.59	92.38	
Forced Outage Rate (%)	2.4%	3.37	5.88	14.31	7.79	3.9	
Vehicle Availability (%)	95%	88.95	91.78	91.13	90.60	95.09	
Maintenance Overtime (%)	7%	8.94	15.48	15.21	12.26	3.27	
Plant Lube Oil Consumption (g/kWh)	<0.65	0.40	0.74	1.02	0.63	0.45	

1.4 GROSS GENERATION

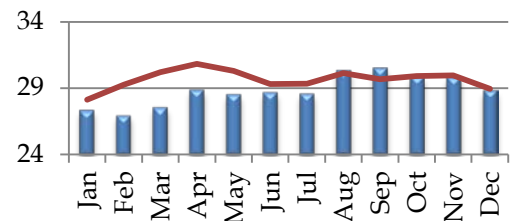
At Queen's Park, gross generation was 16.5 GWhrs which is 1.4% less than last December. Net generation was 15.6 GWhrs resulting in Plant Consumption of 3.55%. Peak demand was 28,940 kW which is 5.0% less than December 2009.

At Carriacou, the gross generation in September was 717,564 kWhrs, an increase of 1% vs. December 09. The peak demand in December was 1,310kW which is 1% less than last December's peak.

In Petite Martinique, gross generation was 69,799kWhrs which is a 0.29% decrease over the same period in 2009. Peak demand was 141kW which is equal to that of last December 2009.



12-Month Peak Load Profile

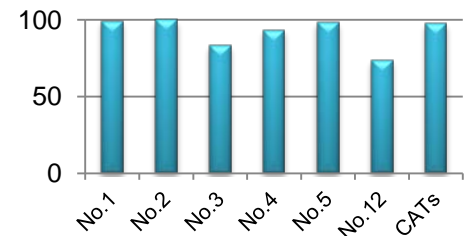


1.5 ENGINE AVAILABILITY

In December, engine availability at Queen's Park was 92.2% due to outages on Nos. 3 & 12. No.12 underwent a planned B' Bank turbo charger overhaul during the month which impacted the availability of the unit.

In Carriacou, engine availability was 99.6%. In Petite Martinique, availability was 100% in December.

AVERAGE AVAILABILITY(%)

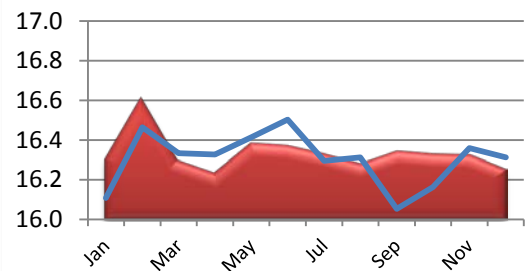


1.6 FUEL EFFICIENCY

Fuel Efficiency at Queen's Park in December was 16.06 kWh/gallon.

Carriacou & Petit Martinique fuel efficiency was 15.5kWh/gal and 11.5kWh/gallon respectively.

12-Month Gross Fuel Efficiency

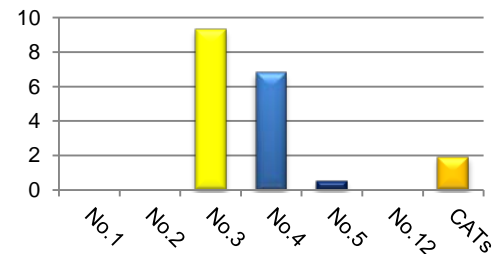


1.7 FORCED OUTAGE RATE

In December the forced outage rate was 2.64%. This was primarily due to a fuel dilution concern on No.3 and a damaged cylinder head on No.4.

There were no outages in Carriacou and Petite Martinique.

FORCED OUTAGE RATE (%)



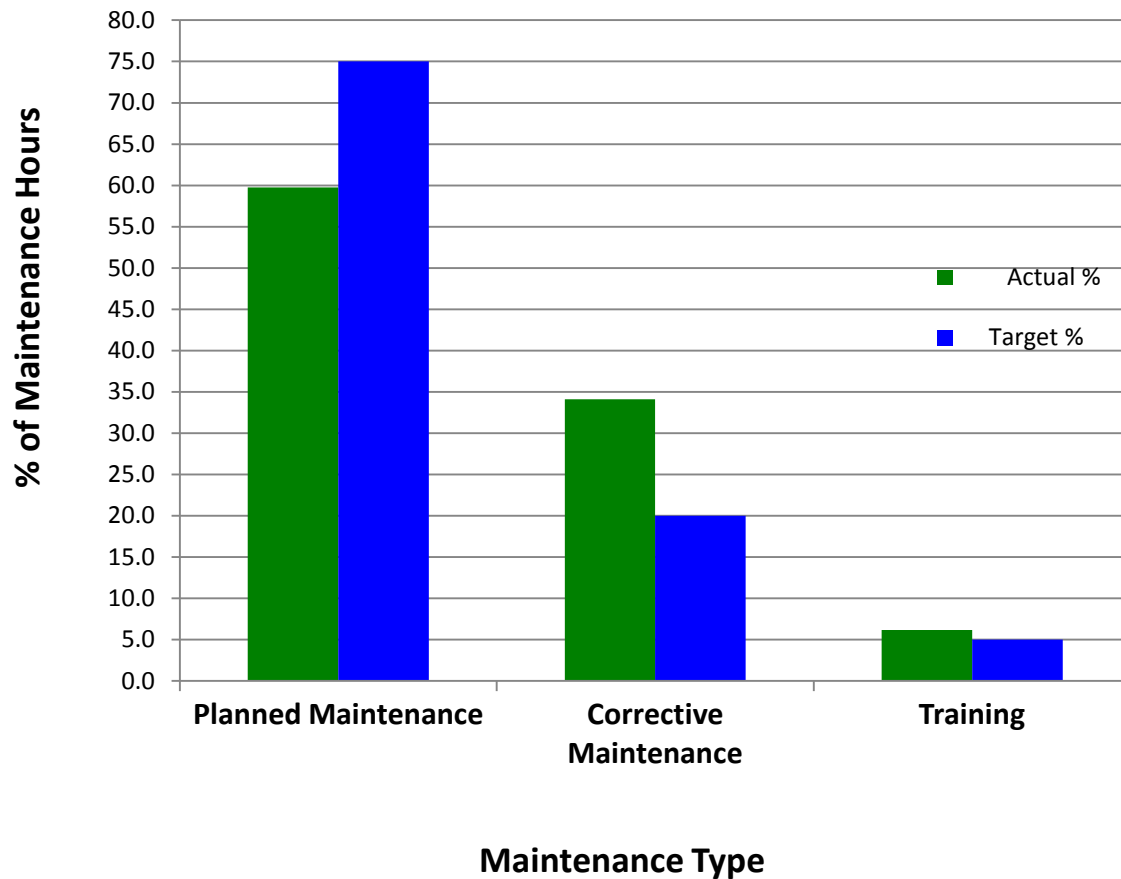
Maintenance Summary Report - December 2010

The most significant activities which took place in December were the overhaul of the turbocharger on the B-Bank of Wartsila genset #12. This was coupled with the alternator cleaning, servicing and testing. At this outage the actuator which was due for Overhaul was replaced with a Unit Exchange from Governor Control Systems. Other corrective maintenance due on the engine was completed during the outage.

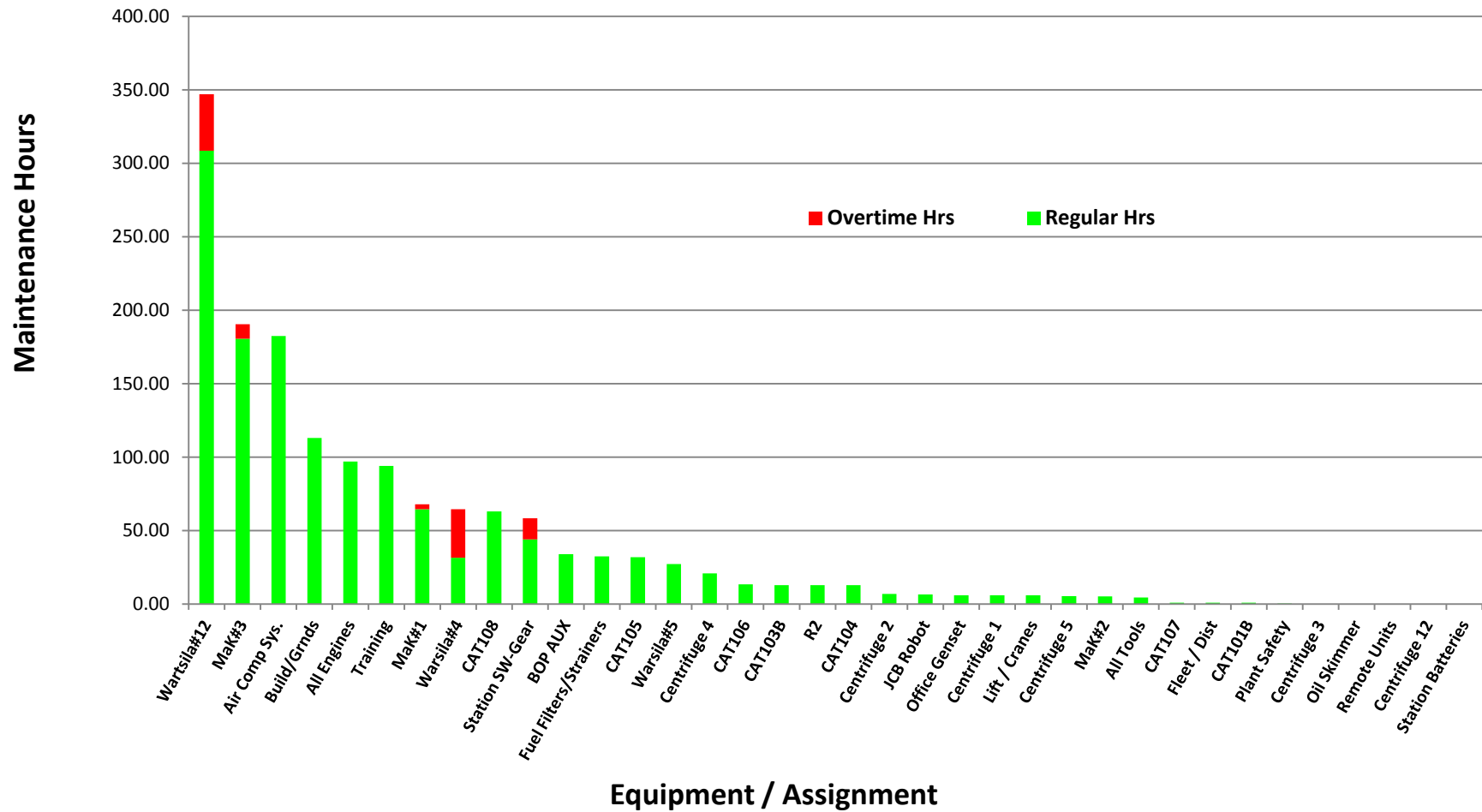
There was a major upgrade to the MaK Compressed Air Station in Plant-B. The new 30-Bar Sperre compressor and Air Receiver were commissioned. A new air dryer which was part of the upgrade was also commissioned. Training and final documentation of the system is ongoing.

MaK #3 remains under close supervision for lube oil contamination with fuel. A number of changes were made to monitor closely the fuel leakage at the injection level on the cylinder heads. So far the situation has stabilized and the monitoring will continue into January-2011.

Maintenance Activity Summary - Dec. 2010



Regular and Overtime Hours Logged - Dec. 2010



Planned Maintenance Services

The following planned services were completed during the month:

- ◆ MAK #1: The 1,500 hour service was completed at 56,732 hrs.
- ◆ Separator CIP Services on Separators #1, #2, #4 and #5.
- ◆ Wartsila #12: 15,000 hour overhaul of the B-Bank turbocharger; Alternator and Inspection Service
- ◆ Plant Motor Testing: Monthly Motor Testing was completed on the MaK engine and auxiliaries.

Generating Units

Wartsila No. 5: A total of 27.25 man hours were logged with this unit. The following were the maintenance activities for the month:

- Two dirty fuel filters were replaced on this unit
- A leaking flexible fuel pipe was replaced on cylinder B1 of the genset.
- A leaking erosion plug was replaced with a new one on cylinder B6 of the unit.
- This Unit was investigated for a Red LED Alarm on the Woodward 723+ Electronic governor. One of the speed transducers had a wire break which was repaired.
- The Control air pressure sensor was investigated again. This time a new cable was installed and connectors installed on the sensor end. Monitoring will continue on the sensor.
- Peak pressure testing was carried out at 32,424 hours. Minor deviations were noted for investigation at the 2000 hrs service in January-2011.
- Repairs were carried out to correct exhaust gas temperature deviations six times during the month. Injectors were serviced in the following positions:
 - Negative EGT on A5 at 31,754 hrs
 - Negative EGT on B6 at 31,908 hrs
 - Negative EGT on A6 at 32,059 hrs
 - Negative EGT on A7 at 32,162 hrs
 - Negative EGT on A6 at 32,281 hrs
 - Negative EGT on B6 at 32,436 hrs

Wartsila No. 4: A total of 64.5 man hours were logged with this unit. The following were the maintenance activities for the month:

- During the month, repairs were carried out on seven fuel injectors to correct exhaust temperature deviations. Injectors were serviced in the following positions:
 - Negative EGT on A1 & B1 at 31,093 hrs
 - Negative EGT on A9 at 31,159 hrs
 - Negative EGT on A9,B3,B5,B9 at 31,373 hr
- Two dirty fuel filters were replaced on the genset.
- A broken high pressure fuel pipe assembly on cylinder B2 was replaced with a new one at 31,450 hours.
- Peak pressure testing of the genset was carried out on December 30th 2010 at 31,453 hours.
- A new coolant pressure gauge was installed onto the HT coolant piping from the radiator of the genset to correct a leak there.
- A leaking flexible leak fuel pipe was replaced with a new one at the #B4 fuel injection pump.
- A new motor was installed on the drive end bearing oil cooler. Performance testing is ongoing on pump.

Wärtsilä No.12: A total of 347 man hours were logged with this unit. The maintenance activities carried out were as follows:

- The overhaul of the B Bank turbocharger overhaul which was started in November was completed in early December. As part of the service broken bolts and gaskets were replaced on the turbo exhaust piping.
- An exchange Actuator was installed on the engine and the used actuator sent back a core. The Actuator was ordered based on name plate information from Woodward. The actuator was however reconfigured by Wartsila and the nameplate information was not updated. As a result the actuator was supplied with wrong voltage coil and was forward acting. The documented changes were: MH = Reverse acting, wired to 971313, sheet 59. 120 VDC shutdown coil; High speed set at 1000 rpm's; Terminal shaft indicator on LH side. No pneumatic override. These changes were made on-site together with calibration of the actuator.
- Repairs were carried out to stop a coolant leak at the #A8 cylinder liner. A new liner was installed.
- Broken mountings were removed and replaced with new ones for the connecting box at the flywheel end of the genset and the hotbox covers were painted.
- The alternator was successfully cleaned. A team from Wartsila Caribbean spent four days onsite cleaning the alternator windings using the dry ice. Two members of the Electrical team participate in the exercise as a form of training and assistance. From the draft report, there was significant improvement to insulation resistance of the rotor and exciter windings. We are stilling awaiting the final report.

MaK No.1: A total of 68 man hours were spent on this unit in carrying out the routine service and also in doing remedial work.

- A peak pressure test was conducted on the genset at 56,745 hours.
- The 1500-hour service was carried out on the genset at 56, 732 hours.
- A leaking coolant hose assembly above the B-Bank charge air cooler was replaced with a new one.
- A fuel leak at #A6 fuel drain pipe was repaired.
- The SEL loan relay was successfully swapped with the upgraded original. This concludes the relay upgrade exercise for the MAK units.
- Motor testing was conducted on the motors associated with this unit.
- An intermittent Earth fault alarm suspected to be linked to the turning gear engage switch was investigated. The plan is now to replace the switch during the next maintenance window.

MaK No.2: A total of 5.25 man hours were logged with this unit.

- A dirty fuel filter was replaced with a clean one.
- Peak pressure testing was done on the genset at 62,180 hrs
- Motor testing was conducted on the motors associated with this unit.

MaK No.3: A total of 190.5 man hours were logged with this unit. The following were the maintenance activates for the month:

- Spare Cylinder Head rebuild: The defective cylinder head removed from A2 position in November was completely rebuilt. All valves, Seats and Guides were replaced.
- Low Lube Oil Viscosity: Internal lube oil analysis in early December indicated a significant drop in lube oil viscosity. The viscosity drop was confirmed by samples sent out to Chevron. The fuel injection system was investigated in more detail. Leak fuel from both the HP fuel Pipe and the injector nozzle were examined independently. Minor fuel leaks were corrected on two injectors. In an effort to reduce the

likely hood of fuel oil contamination, the injector leak fuel pipe work was temporarily disconnected from the return fuel rail. This reduced the fuel pressure that the injectors O-Ring were subjected to during operation. This leak fuel lines are now monitored for signs of excessive fuel leakage and lube oil cross contamination. To-date note were found. The lube oil viscosity on the engine has since stabilized at 115Cst and weekly viscosity check is conducted to monitor the situation.

- On the 28-December there was a failure in the exhaust system which initially manifested itself as multiple high exhaust gas temperatures. The lack of boost pressure in the Rockwell trend made it difficult to initially diagnose. A major crack in the exhaust pipe adjacent to the A8 cylinder was late discovered. The root cause of the failure was a failure of the pipe support adjacent to the exhaust pipe on the turbo side. The pipe supports were replaced and the exhaust pipe was welded. The pipe support on the B-Bank was also replaced.
- A leaking butterfly valve on the lube oil supply pipe to the engine was replaced on 28-Dec.
- Peak Pressure Testing was completed on the unit at 51,592 operating hours.
- The Exhaust gas temperature sensor on cylinder B6 was investigated for faulty readings and had to be replaced.
- Motor testing was conducted on the motors associated with this unit.

CAT101B:

- This Unit was investigated for no auxiliaries in the container. The supply breaker in the cable vault was found in a tripped stated and had to be reset.

CAT 104:

- Repairs were carried out to replace damaged O-rings on the charge air ducting. New fuel control valves were fitted to the supply piping to replace leaking ones.

CAT 105:

- The electronic governor on the unit was removed and the one taken from Cat #106 was installed.

CAT 106:

- The radiator was pressure washed and the source of the coolant loss was identified. Repairs of the radiator will be done in early January.
- This unit was loaded for a few days to acclimatize the new oil to the transformer conditions. A sample has been taken and sent to the Doble labs for analysis.
- The 2301 Governor belonging to Cat 105 was swap with the original.

CAT 107:

- The driving belt for the radiator fan was checked for wear and was re-tensioned to eliminate a screeching noise heard due to slackness in the belt.
- Remedial work to repair the burnt crankcase breather pipe (initially planned for December) will be carried out in early January 2011.

CAT 108:

- In December, repairs were conducted on the exhaust stack which was leaning dangerously due to breakage. The stack was taken down from the silencer, the faulty section of the piping was cut off and a serviceable piece of piping was fitted. The repaired stack was refitted to the silencer with new bolts and nuts.
- One new fuel filter was fitted in place of a dirty one on the genset.

- Two broken exhaust bellows are awaiting replacement on the genset. The new ones ordered are in transit to Grenada and are expected to be available shortly to facilitate the repairs.

Balance of Plant Auxiliary Units

- MaK Compressed Air Station: Work continued on the Plant air system upgrade to provide greater reliability of the Plant's compressed air system. The new Sperre air compressor was installed and the interconnecting pipes installed and connected to the unit. The unit was commissioned during the month. In association with this project, a platform was fabricated for installation over a section of the pipe-work. This is geared at facilitating easier access between the new compressor and its associated system components.
The Air Dryer Was successfully commissioned during the month.
- The servicing of the fuel filters and fuel strainers were carried out on the large gensets during the month.
- The Electrical compressor for Wartsila # 12 was investigated for malfunction, however no fault was found on the unit.
- The Battery charger on the Wartsila # 4 and 5 starting air compressor station was damaged. A temporary charger has been installed and a replacement has been ordered.
- The Kranco was investigated for not operating. A fuse was found to be blown and it had to be replaced.

Buildings / Grounds / Safety Equipment

- The SW oil separator was inspected and 8 drums of waste oil and fuel were removed.
- The repeated malfunctioning of the front gate was investigated. Repairs are required for the upper section of the gate which is breaking and the rollers are severely worn out. Repairs of the gate are expected to begin during the month of January 2011.
- The operation of the lighting at the back of the MAK #1 transformer was investigated and revealed that there was a blown bulb. This faulty bulb was replaced with a new one.
- The fire extinguisher located along the corridor outside of the conference room was relocated as it was creating an obstruction to free movement in that area. Its current location is near the entrance to the Generation Manager's office.
- The section of the workshop for electrical maintenance was cleaned out and unwanted items were disposed of at the end of December. Work was also carried out in sorting and relocating the mechanics' tools to the new tool storage cabinets in the tool room.
- The Control circuit and pump motors for the south west oil water separators were successfully tested and verified.
- The Front gate was investigated for not operating. Some WD-40 was used to lubricate the rollers. Mechanical repairs are needed on both gates, as some parts are rusted and the rollers seem to be creating excessive friction.
- The isolators and cabling have been successfully completed for the installation of battery isolators in the switchgear building. Some minor work still needs to be completed before the cut-over exercise can be scheduled.
- The Electrical cupboards in the workshop were cleaned; items sorted and damaged items discarded.

Station Switch-Gear:

- The Multilin relays on Bus D were linked in daisy chain by a communication cable. This cable was then connected to a GE multinet device which was installed to provide remote communication to the Multilin relays.
- The Control cables for remote operation for breaker 52-C3 was successfully installed. The Breaker can now be operated from the operator's switchboard.

External Department Assistance

Assistance to Fleet:

- **TAA419:** The cylinder head of this vehicle was tested to determine whether or not it was cracked. The dye penetrant test was use a test kit was supplied to Fleet to facilitate future testing at fleet. Y. Persaud did demonstrations with L. Gilbert to facilitate future testing at Fleet

Lube Oil Separators

#2 Separator:

- A 720 hour CIP service was carried out on the unit.

#3 Separator:

- Consultation is continuing to take place with Westfalia Separator Technician (David Youngblood). The separator remains isolated from engine and testing will continue into 2011. The unit continues to contaminate process lube oil with water.

#4 Separator:

- A 720 hour CIP service was carried out on the unit.

#5 Separator:

- A 720 hour CIP service was carried out on the unit

Remote and Portable Units

Cat 103B & Cat R2 and the Main Office Generator Sets.

- Three weekly inspections were conducted at these remote units. Current hours on these units are:
 - CAT 103: - 19,254 hrs
 - R2: - 19,836 hrs
 - Office Genset: 1,395 hrs
 - A coolant leak was noted on the office genset radiator. This is being schedule for repair in Jan-2011.

Health & Safety

The Health and Safety meeting for the month of November was held on December 2nd 2010. At the end of the year 2010, the Generation Department recorded 1,072 days without a lost time accident.

The Health and Safety meeting for December is expected to be held in the early part of January 2011.

Lube Oil Quality

Consumption

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

Quality

Lube oil samples were taken from engines #1, #2, #3, #4 #5 & #12 for overseas analysis. Internal lube oil testing was also conducted with emphasis on MaK#3.

MaK#3: After replenishment of lube oil, lube on 25-Nov-2010 continued to show signs of fuel dilution into the first week of December. After further corrective actions the lube oil viscosity has stabilized at 115Cst since the 16th December with weekly samples taken and tested to confirm stability.

Wartsila #4: The TBN on this unit remains low at its minimum value of 6 due to very low lube oil consumption on the engine. The separator discharge frequency has been increased in an effort to artificially increase fresh oil make up.

Fuel Quality

Fuel quality supply to the Wartsila units in Plant-B has been compromised due to contamination in the fuel recover tank. Intermittent operation of the Sludge Pump resulted in some sludge mixing with clean leak fuel. The recovery system is currently undergoing modification to eliminate the likely hood of this mixing. Increased fuel filter changes and dirty strainers were noted on the W32 system during this period.

Training

- **Vehicle Fault Diagnosis & Maintenance Training:** In this regard, Bill Baptiste and Nickson Robertson attended training sessions at the Grand Anse Compound from December 6th to December 9th 2010.

SECTION II: QUEEN’S PARK

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2. QUEENS PARK POWER STATION STATISTICS

GRENADA ELECTRICITY SERVICES QUEENS PARK POWER STATION STATISTICS Dec-10

Month	Day In Month	Gross Gen (KWh)	Station Aux. (kWh)	Admin Use	Net Gen. (kWh)	*** 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-10	31	16,367,218	464,318	23,949	15,902,900	2.84%	1,010,550	27.31	28.12	42,400	8,798	16.20	15.74	40.91%	78.23%	44.11%
Feb-10	28	15,278,262	468,862	22,491	14,809,400	3.07%	936,046	26.94	29.26	42,400	8,752	16.32	15.82	41.13%	77.69%	45.59%
Mar-10	31	17,643,009	664,709	25,772	16,978,300	3.77%	1,077,319	27.52	30.20	42,400	8,791	16.38	15.76	40.95%	78.50%	47.55%
Apr-10	30	17,107,767	490,567	24,599	16,617,200	2.87%	1,046,620	28.82	30.83	42,400	8,726	16.35	15.88	41.26%	77.07%	47.65%
May-10	31	17,174,553	503,853	25,452	16,670,700	2.93%	1,045,245	28.49	30.31	42,400	8,760	16.43	15.95	41.09%	76.16%	46.29%
Jun-10	30	16,058,683	465,583	25,045	15,593,100	2.90%	975,128	28.62	29.32	42,400	8,760	16.47	15.99	41.55%	76.07%	44.72%
Jul-10	31	16,543,488	497,588	23,906	16,045,900	3.01%	1,024,156	28.54	29.34	42,400	8,755	16.15	15.67	41.12%	75.79%	44.59%
Aug-10	31	17,032,898	483,098	24,820	16,549,800	2.84%	1,083,208	30.28	30.14	42,400	8,853	15.72	15.28	40.67%	75.96%	45.91%
Sep-10	30	16,524,195	461,294	24,589	16,062,900	2.79%	1,059,455	28.78	29.67	42,400	8,921	15.60	15.16	40.35%	77.35%	46.02%
Oct-10	31	17,126,310	523,810	24,960	16,602,500	3.06%	1,080,047	29.82	29.90	42,400	9,005	15.86	15.37	39.98%	76.99%	46.16%
Nov-10	30	16,534,281	566,180	23,911	15,968,100	3.55%	1,039,671	29.77	29.97	42,400	9,021	15.90	15.36	38.49%	74.00%	44.47%
Dec-10	31	16,249,349	576,449	24,205	15,672,900	3.55%	1,057,183	28.78	28.94	42,400	9,229	15.37	14.83	39.01%	75.47%	43.79%
Total		199,640,013	6,166,311	293,699	193,473,700		12,434,628									
Average		16,636,668	513,859	24,475	16,122,808	3.10%	1,036,219	28.64	29.67	42,400	8,864	16.06	15.57	40.54%	76.61%	45.57%
Max		17,643,009	664,709	25,772	16,978,300	3.77%	1,083,208	30.28	30.83	42,400	9,229	16.47	15.99	41.55%	78.50%	47.65%

Density Figure obtained from Texaco - 0.8526KG/L

Colorific Heat Value of fuel obtained from Texaco 42400 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 = Gross Generation /Total Auxiliary

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

3. QUEEN'S PARK ENGINE SUMMARY

DECEMBER 2010

Engine No.	Online Hours	Standby Hours	Forced Hours	Planned Hours	Units Gen. (kWh)	Fuel Con. (US gals)	On line Hours (%)	Percent Avail. (%)	Forced Rate (%)	Planned Rate (%)	Capacity Factor (%)	Heat Rate (KJ/kWh)	Fuel Effic. (Units)	Effic. (%)
Cat.101B	82.28	661.72	0	0	95420	7231.7	11.1	100	0	0	82.4	10554	13.2	34.1
Cat.103B	0	744	0	0	0	0	0	100	0	0	0	0	0	0
Cat. 104	3.26	740.74	0	0	3639	320	.4	100	0	0	75.9	12246	11.4	29.4
Cat. 106	30.65	628.06	57.75	27.77	30570	2377.7	4.1	88.5	7.8	3.7	81.7	10831	12.9	33.2
Cat. 107	10.95	733.05	0	0	11415	774	1.5	100	0	0	83.2	9443	14.7	38.1
Cat. 108	115.39	575.42	40.08	13.14	134671	9855.7	15.5	92.9	5.4	1.8	90.6	10191	13.7	35.3
R2	0	744	0	0	0	0	0	100	0	0	0	0	0	0
12	82.77	466.26	0	195	326800	23466	11.1	73.8	0	26.2	78.8	10000	13.9	36
MaK 1	546.06	191.07	0	6.90	2321734	143470.5	73.4	99.1	0	0.9	77	8605	16.2	41.8
MaK 2	297.49	447.51	0	0	1242481.60	75845.8	40	100.1	0	0	74.5	8501	16.4	42.3
MaK 3	568.99	51.16	69.5	54.35	3269626.20	198053	76.5	83.4	9.3	7.3	76.6	8435	16.5	42.7
Wart 4	688.18	5.04	50.78	0	4388954	265997.2	92.5	93.2	6.8	0	79.6	8440	16.5	42.7
Wart 5	694.28	36.32	3.80	10.50	4424038	268723.5	93.3	98.2	0.5	1.4	79.6	8459	16.5	42.6

4. QUEEN'S PARK LUBE OIL STATUS

DECEMBER 2010

Engine No.	Make-Up	Oil Change	Usage Rate (g/kWh)	Average Usage Rate (g/kWh)	Texaco Taro	Texaco URSA Super Plus 15W40
Cat. 101B	6	0	0.21			6
Cat. 103B	0	0	0			0
Cat. 104	0	0	0			0
Cat. 105	0	0	0			0
Cat 106	0	0	0			0
Cat. 107	0	0	0			0
Cat. 108	12	0	0.30			12
R2	0	0	0			0
12	0	0	0	0.65	0	
MaK 1	209	0	0.30	0.55	209	
MaK 2	599	0	1.62	0.55	599	
MaK 3	493	0	0.51	0.55	493	
Wart 4	388	0	0.30	0.43	388	
Wart 5	589	0	0.45	0.43	589	
	2296	0	3.69	3.16		18

5. QUEEN'S PARK FUEL DATA

Month	Texaco Fuel Received (US Gals)	Fuel Used (US Gals)	Percent Difference
January	1,032,529	1,010,550	-2.18
February	950,599	936,046	-1.55
March	1,091,874	1,077,319	-1.35
April	1,062,902	1,046,620	-1.56
May	1,069,174	1,045,245	-2.29
June	994,817	975,128	-2.02
July	1,021,251	1,013,324	-0.78
August	1,069,797	1,083,208	1.24
September	1,051,396	1,059,455	0.76
October	1,053,062	1,080,047	2.50
November	1,053,204	1,039,671	-1.30
December	1,018,946	1,057,183	3.62

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

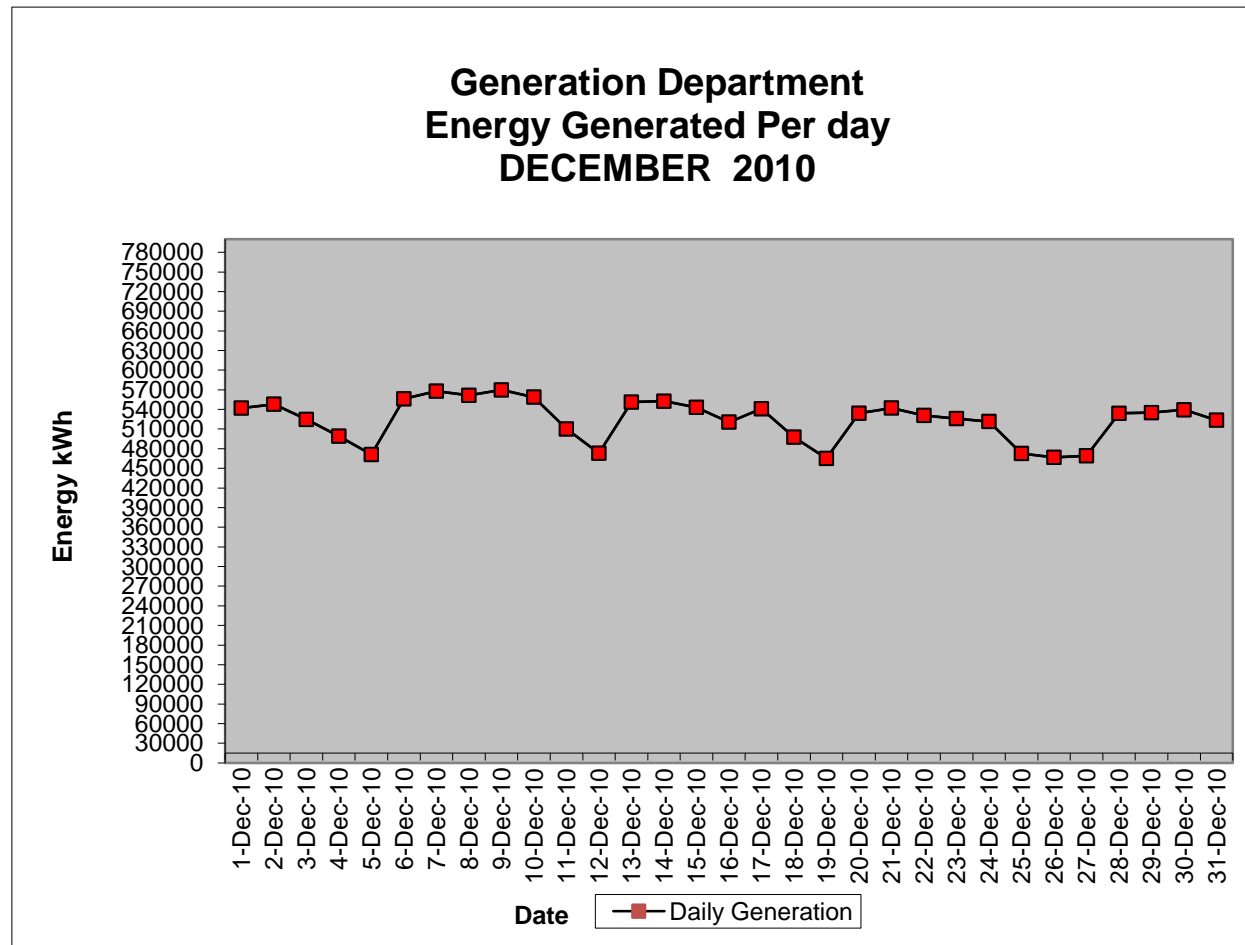


Figure (i) - Energy Generated

Generation Department Maximum and Minimum Load Variation DECEMBER 2010

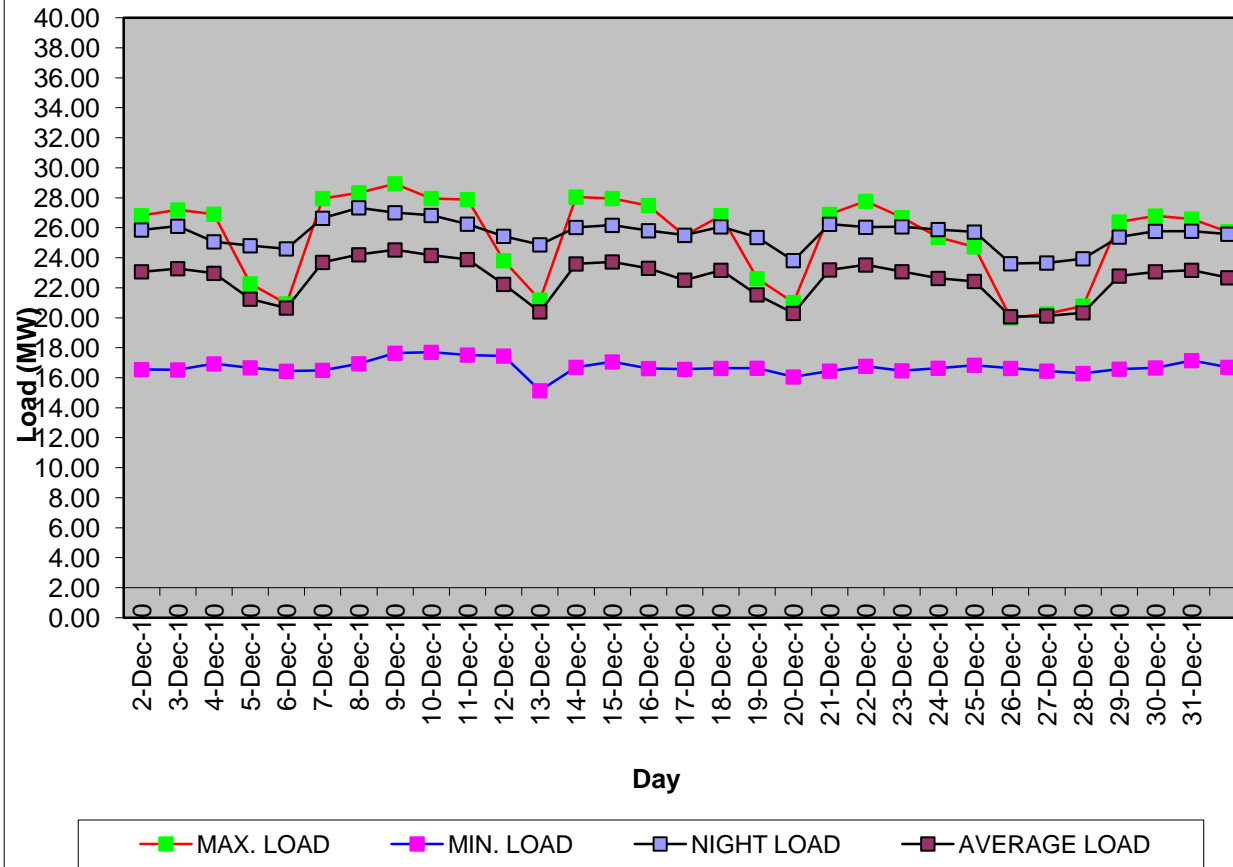


Figure (ii) - Load Variation

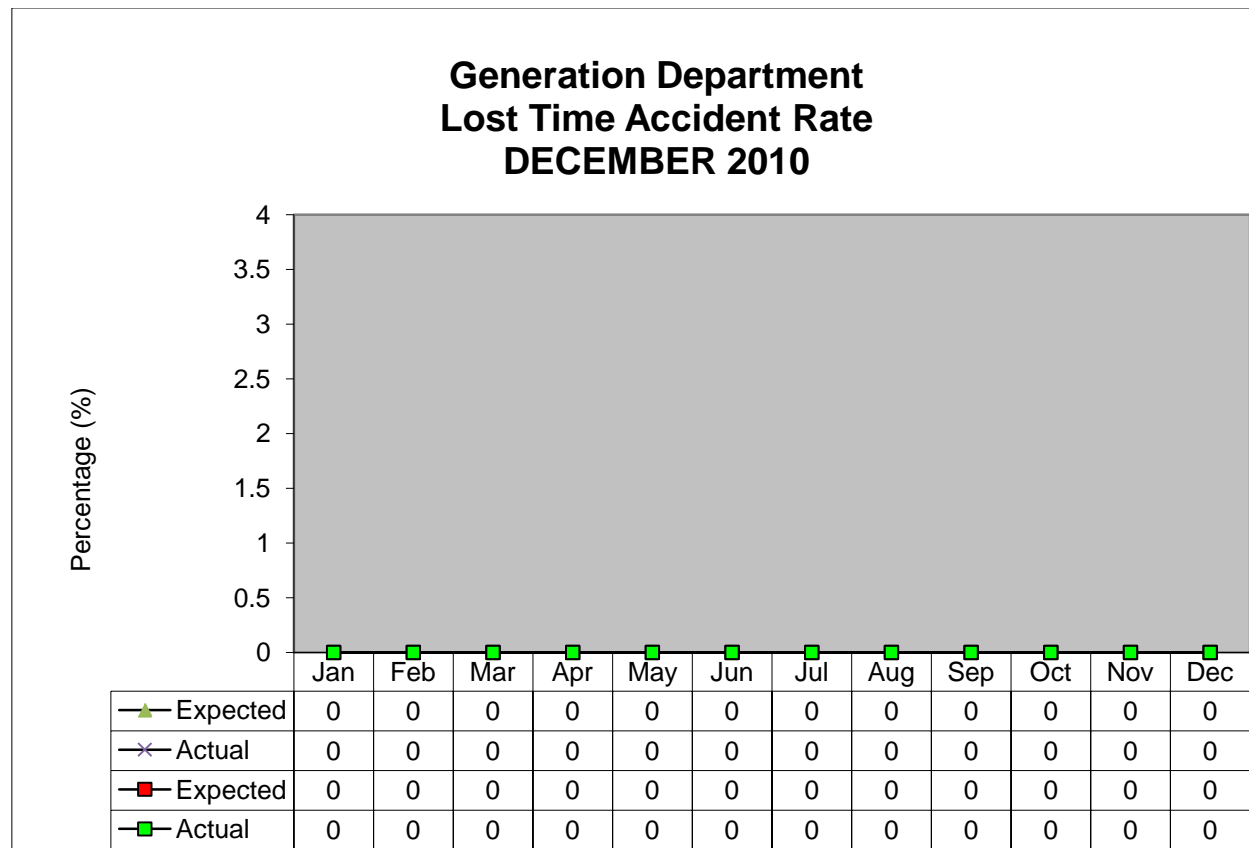


Figure (iii) - Lost Time Accident

Lost days/Person days worked * 100

**Generation Department
Productivity
DECEMBER 2010**

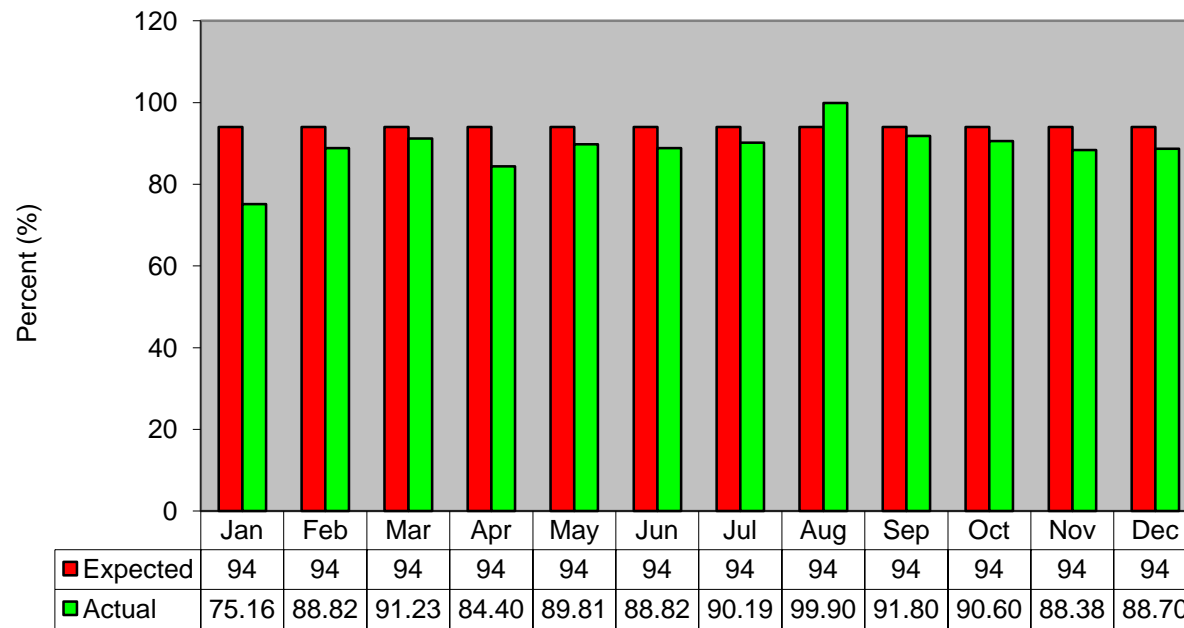


Figure (iv) - Productivity

Hours worked from Work Order/Total Attendance hours * 100

Generation Department Overtime Worked DECEMBER 2010

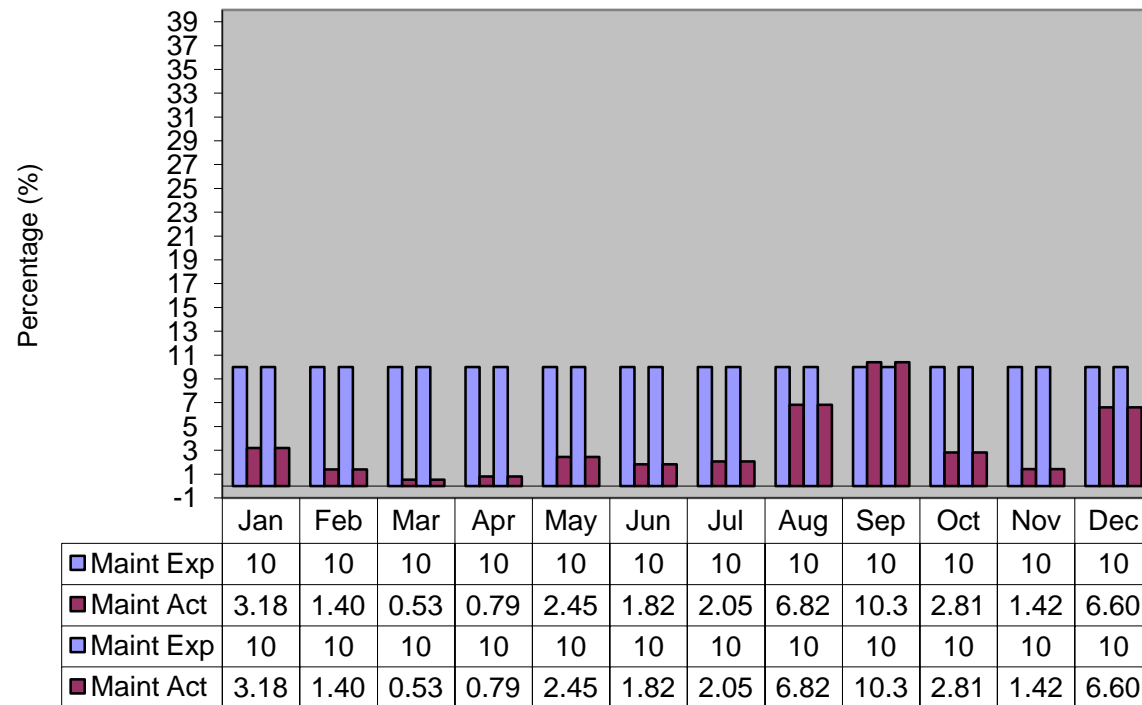


Figure (v) - Overtime Worked

Total overtime worked/total hours worked * 100

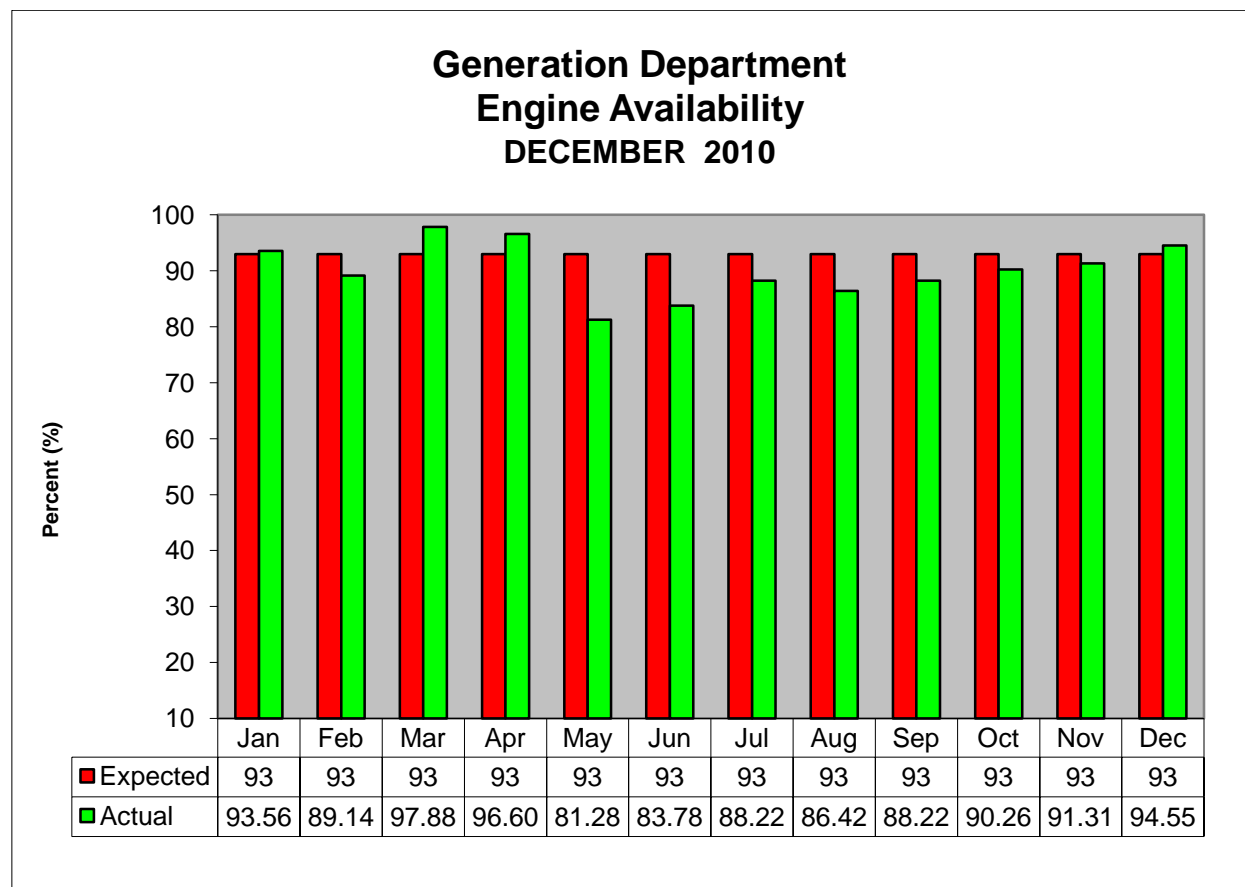


Figure (vi) - Engine Availability

Rated Output Capacity/ Installed Output Capacity * Percent Availability
Formula has been modified, January & February updated

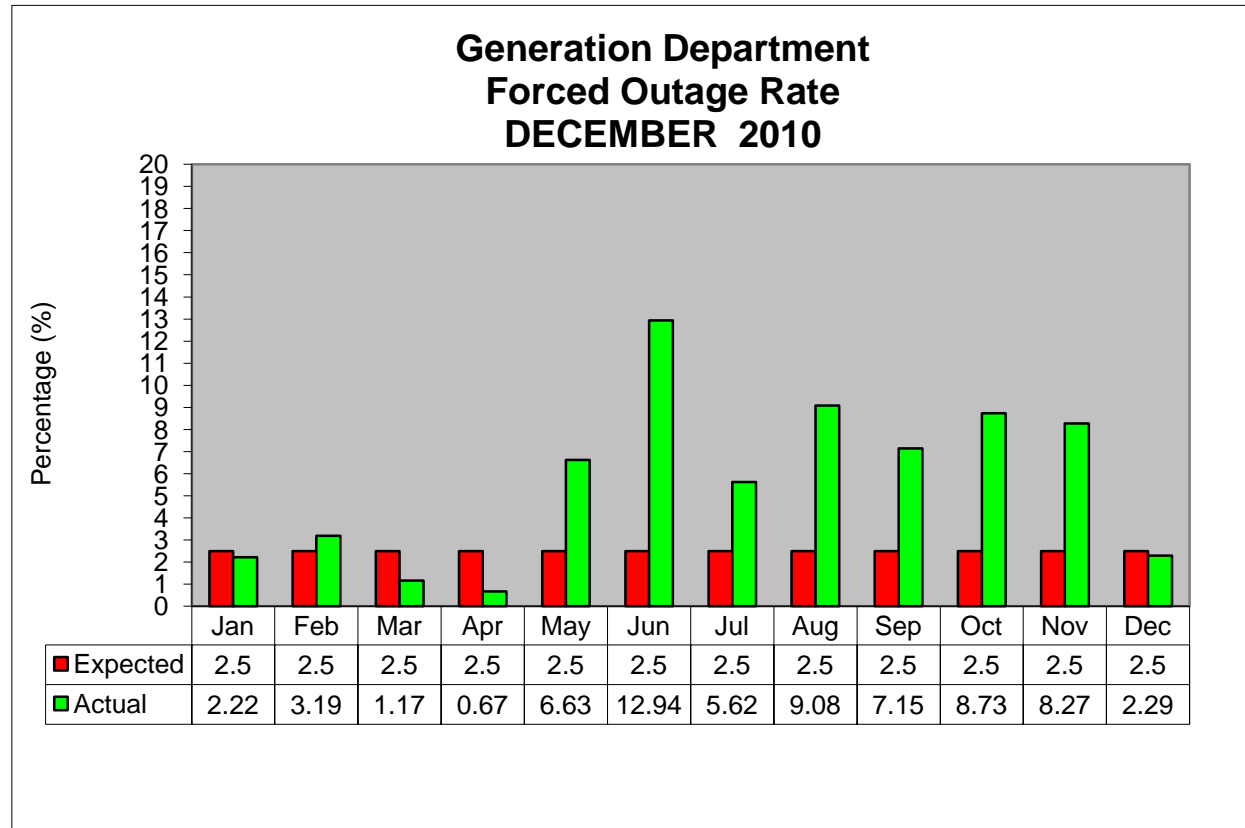


Figure (vii) - Forced Outage Rate

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

**Generation Department
Planned Outage
DECEMBER 2010**

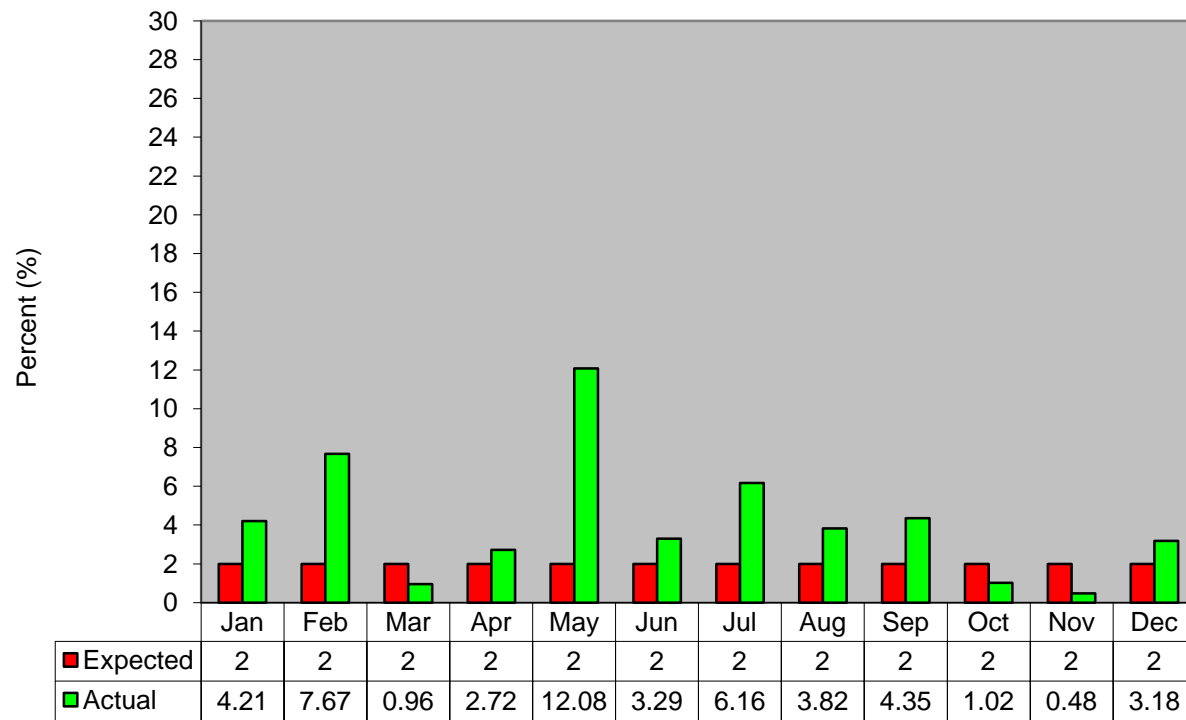


Figure (viii) - Planned Outage Rate

Total Percentage Planned Outage of all engines/ No of Engines

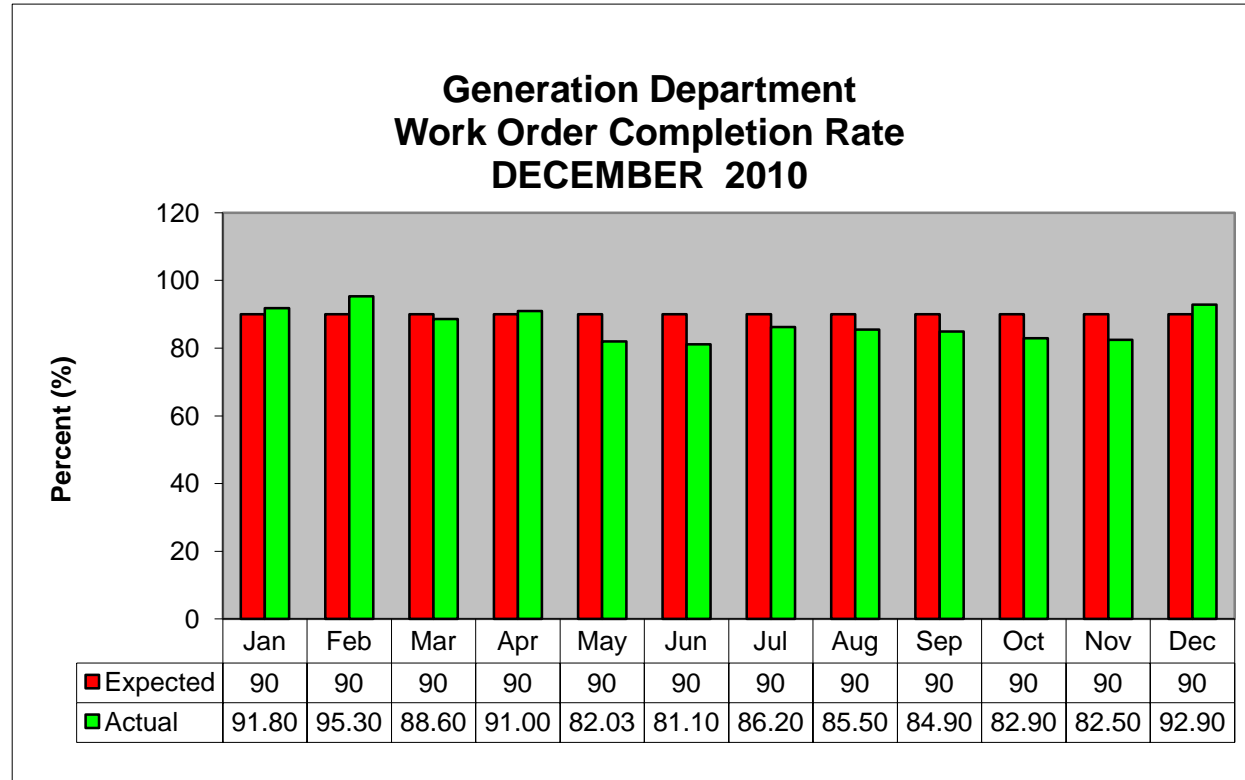


Figure (ix) - Work Order Completion Rate

Works Order Closed/Works Order Open * 100

SECTION III: CARRIACOU DEPARTMENT

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Figure (vii) - Planned Outage Rate	37

6. CARRIACOU POWER STATION STATISTICS

GRENADA ELECTRICITY SERVICES CARRIACOU POWER STATION STATISTICS Dec-10

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-10	31	683,934	21,408	662,526	3.13%	44,962	1116	1215	42,400	9,096	15.21	14.74	39.58%	75.66%	47.88%
Feb-10	28	629,800	19,703	610,097	3.13%	41,258	1143	1252	42,400	9,064	15.26	14.79	39.72%	74.86%	48.81%
Mar-10	31	706,529	22,212	684,317	3.14%	46,039	1113	1222	42,400	9,021	15.35	14.86	39.91%	77.71%	49.46%
Apr-10	30	677,211	20,560	656,651	3.04%	44,559	1134	1250	42,400	9,109	15.20	14.74	39.52%	75.25%	48.99%
May-10	31	706,861	23,180	683,681	3.28%	46,240	1194	1216	42,400	9,133	15.29	14.79	39.42%	78.13%	49.48%
Jun-10	30	667,414	19,979	647,435	2.99%	44,770	1190	1193	42,400	9,286	14.91	14.46	38.77%	77.70%	48.28%
Jul-10	31	705,999	19,740	686,259	2.80%	47,250	1309	1309	42,400	9,190	14.94	14.52	38.77%	72.49%	49.42%
Aug-10	31	716,500	18,128	698,372	2.53%	48,184	1313	1276	42,400	9,106	14.87	14.49	39.54%	75.47%	50.16%
Sep-10	30	683,374	13,087	670,287	1.92%	47,970	1227	1272	42,400	9,542	14.25	13.97	37.73%	74.62%	49.43%
Oct-10	31	696,272	9,518	686,754	1.37%	50,890	1267	1190	42,400	10,109	13.68	13.49	35.61%	78.64%	48.74%
Nov-10	30	680,632	12,937	667,695	1.90%	48,028	1249	1220	42,400	9,830	14.17	13.90	36.62%	77.14%	49.02%
Dec-10	31	717,564	20,634	696,930	2.88%	46,320	1324	1310	42,400	8,826	15.49	15.05	40.79%	73.62%	50.23%
Total		8,272,090	221,086	8,051,004		556,470									
Average		689,341	18,424	670,917	2.68%	46,373	1215	1244	42,400	9,276	14.88	14.48	38.83%	75.94%	49.16%
Max		717,564	23,180	698,372	3.28%	50,890	1324	1310	42,400	10,109	15.49	15.05	40.79%	78.64%	50.23%

Density Figure obtained from Texaco - 0.8526KG/L

Colorific Heat Value of fuel obtained from Texaco 42400 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 = Gross Generation /Total Auxiliary

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

7. CARRIACOU ENGINE SUMMARY:

DECEMBER 2010

Engine No.	On – Line Hours	Stand-by Hours	Forced Hours	Planned Hours	Units Gen. (kWh)	Fuel Con. (US gals)	Hours On-line (%)	Percent Avail.	Forced Rate (%)	Planned Rate (%)	(%) Station Use	Capacity Factor (%)	Heat Rate (KJ/KG)	Fuel Effic. (kWh)	Effic. (%)
1	539	203	0.0	2.0	210317	13140	72.4	99.7	0.0	0.3	1.1	27.4	8676.3	16	41.6
2	644	96	0.0	4.0	255053	16731.6	86.6	99.5	0.0	0.5	1.4	27.8	9094	15.3	39.6
3	652	85	0.0	7.0	252194	16448.4	87.6	99.1	0.0	0.9	1.4	26.7	9034.84	15.3	39.8
105	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

CARRIACOU LUBE OIL STATUS:

DECEMBER 2010

Engine No.	Make- up	Oil Change	Usage Rate (%)	Shell Rimula X15 W40
1	2.8	78	0.04	80.8
2	10.5	78	0.14	88.5
3	8.5	117	0.11	125.5
CAT105	0	0	0	0
TOTAL	21.8	273	0.29	294.8

8. CARRIACOU FUEL DATA:

Month	Texaco Fuel Received (US Gals)	Fuel Used (US Gals)	Percent Difference
January	43,680	44,962	2.85
February	43,070	41,258	-4.39
March	45,360	46,039	1.47
April	46,800	44,559	-5.03
May	48,000	46,240	-3.81
June	45,360	44,770	-1.32
July	48,000	47,250	-1.59
August	48,000	48,184	0.38
September	49,440	47,970	-3.06
October	48,960	50,890	3.79
November	49,247	48,028	-2.54
December	52,440	46,320	-13.21

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

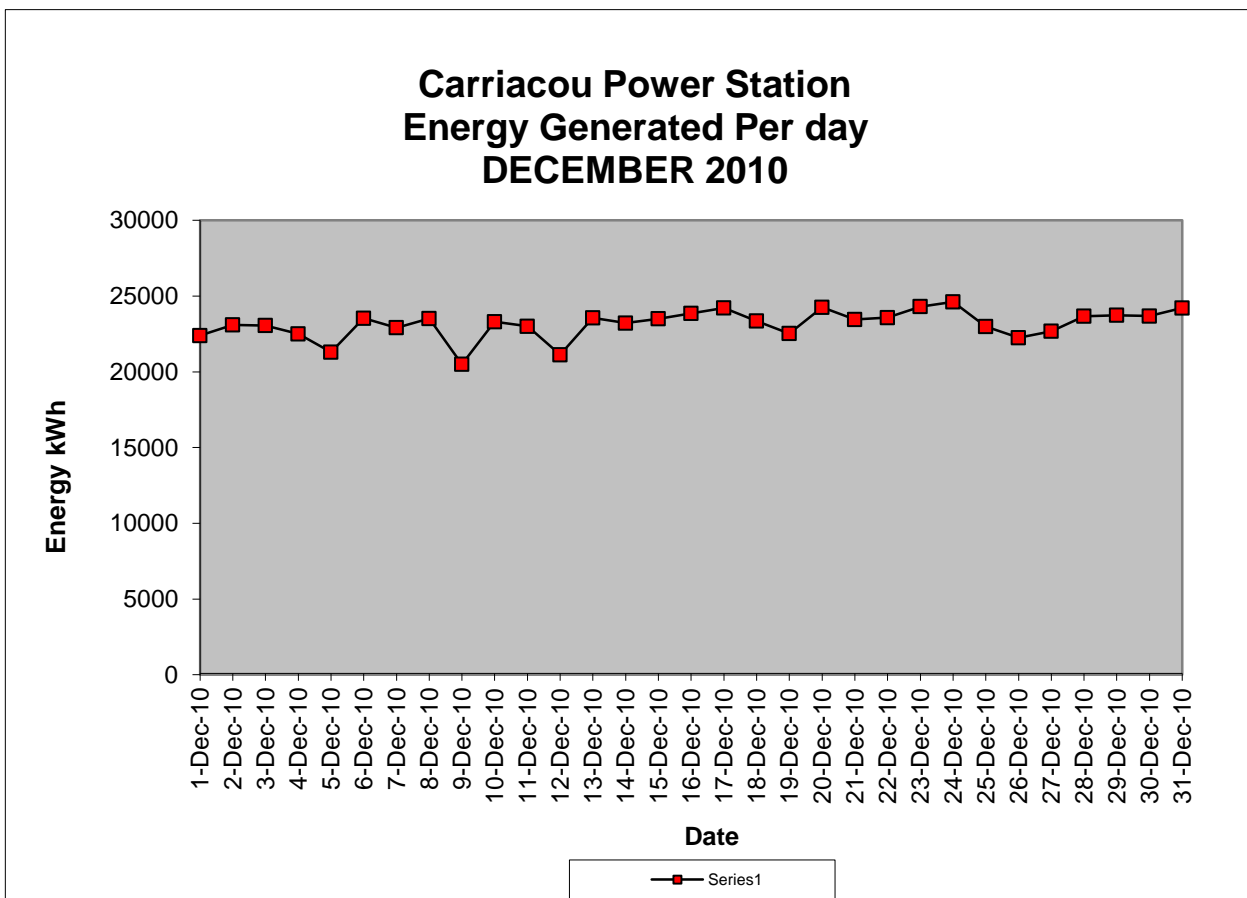


Figure (i) – Energy Generated

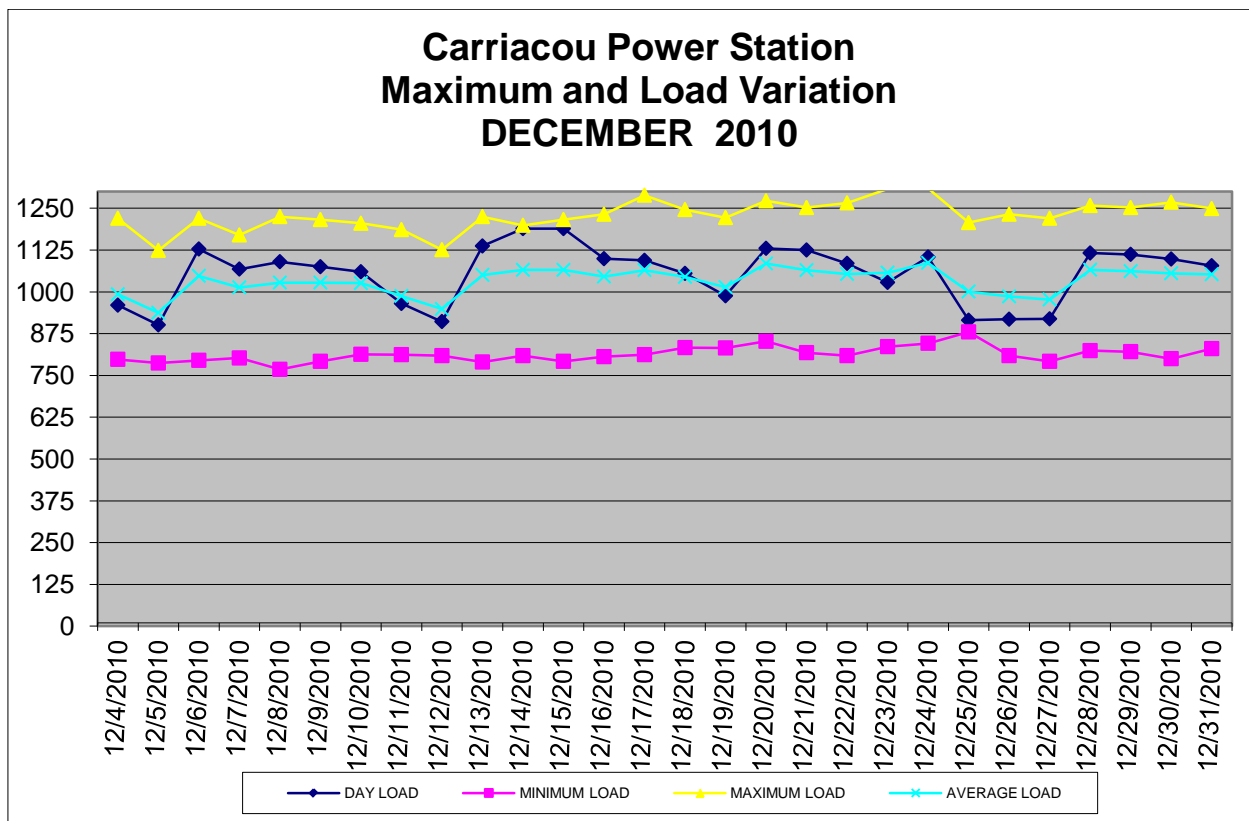


Figure (ii) – Load variation

Carriacou Power Station Lost Time Accident Rate DECEMBER 2010

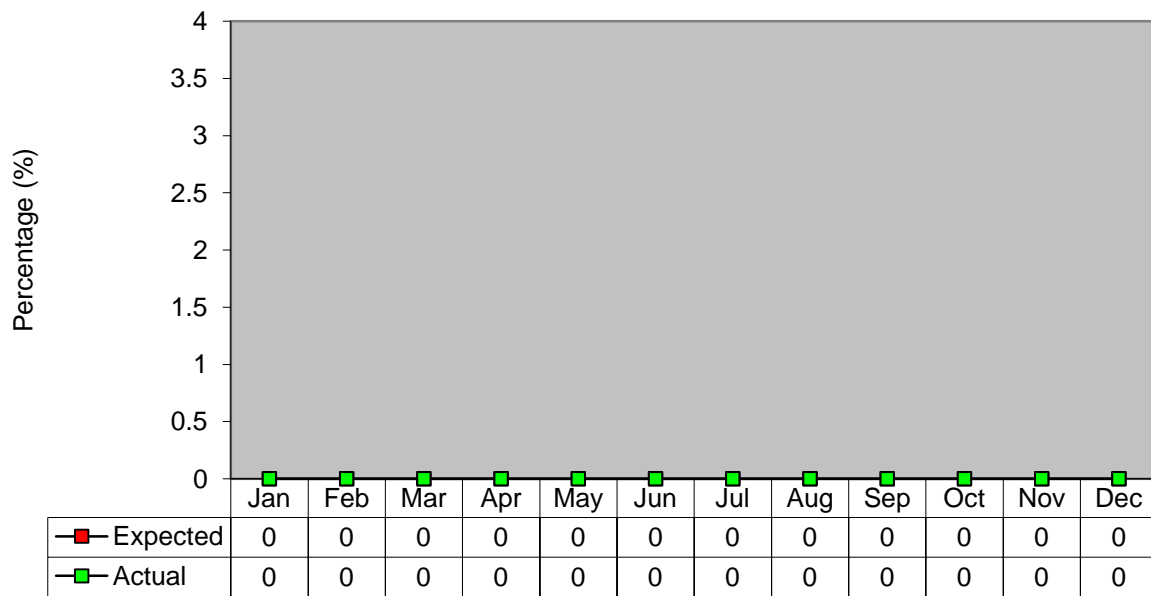


Figure (iii) - Lost Time Accident

Lost days/Person days worked * 100

Carriacou Power Station Productivity DECEMBER 2010

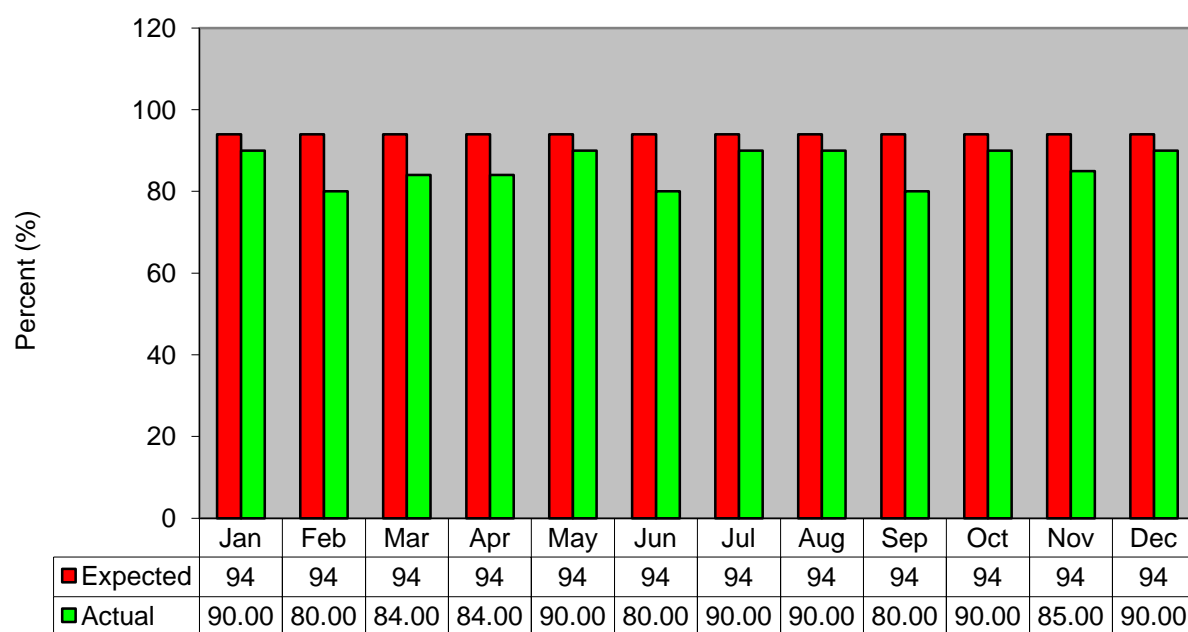


Figure (iv) - Productivity

Hours worked from Work Order/Total paid hours*

Carriacou Power Station Engine Availability DECEMBER 2010

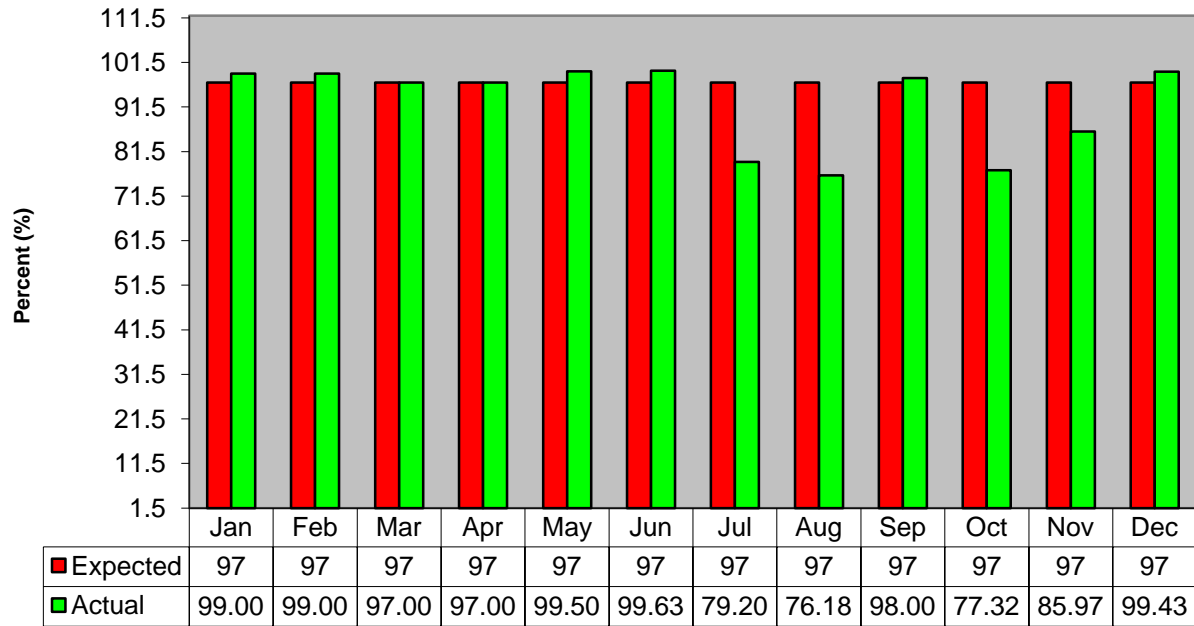


Figure (v) – Plant Availability

Availability of all engines/No of engines* 100

Carriacou Power Station Forced Outage Rate DECEMBER 2010

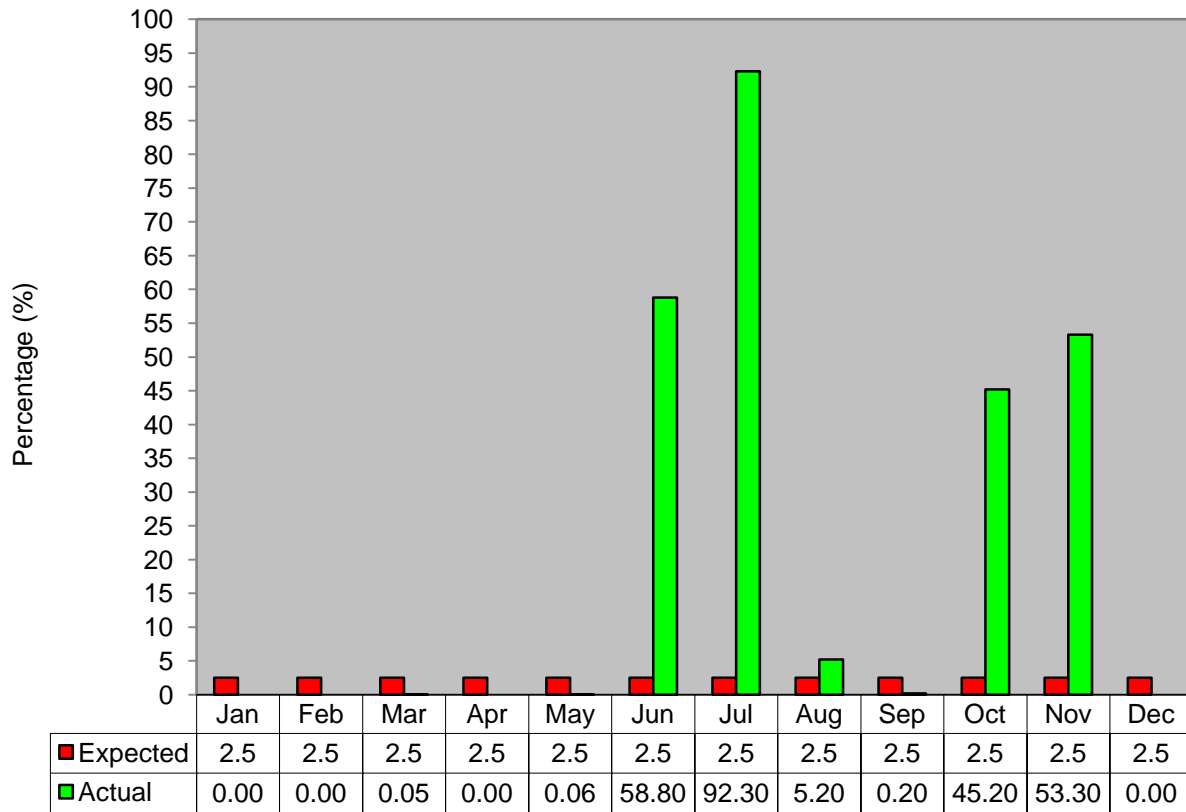


Figure (vi) - Forced Outage Rate
Total force outage of all engines/No. of engines* 10

Carriacou Power Station Planned Outage DECEMBER 2010

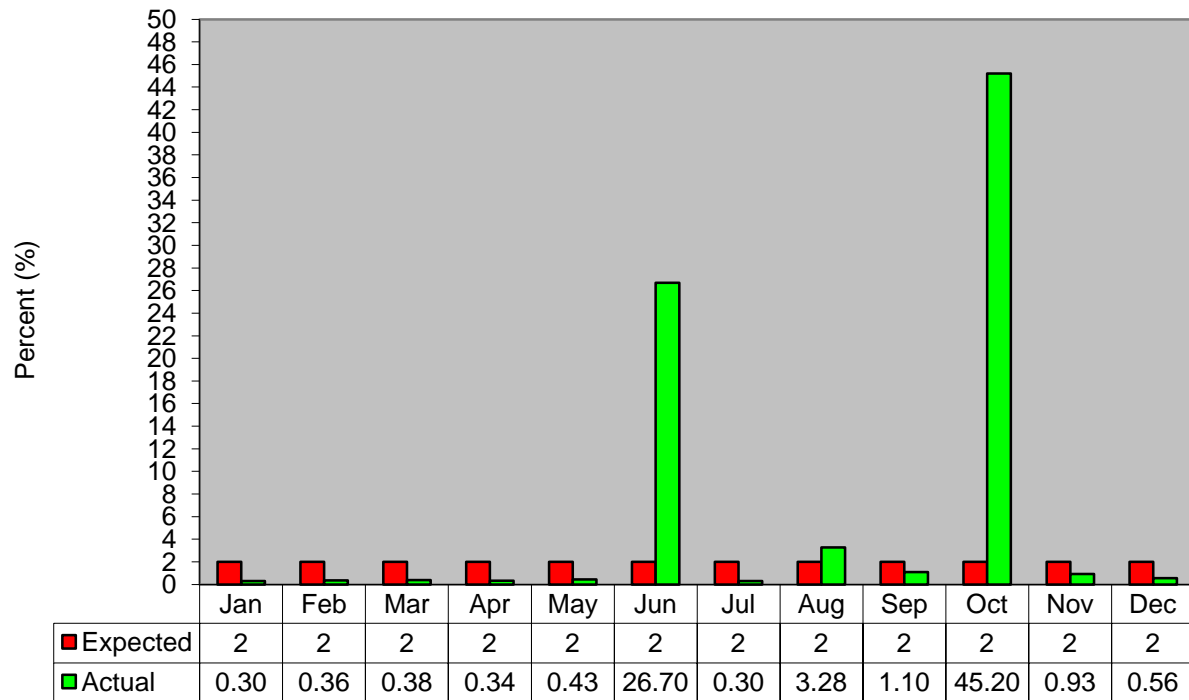


Figure (vii) - Planned Outage Rate

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

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9. PETITE MARTINIQUE POWER STATION STATISTICS

GRENADA ELECTRICITY SERVICES PETIT MARTINIQUE POWER STATION STATISTICS Dec-10

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-10	31	69,335	3,030	66,305	4.37%	6,206	142	131	42,400	12,394	11.17	10.68	29.05%	71.14%
Feb-10	28	61,983	1,934	60,049	3.12%	5,365	128	130	42,400	11,985	11.55	11.19	30.04%	70.95%
Mar-10	31	67,897	1,871	66,026	2.76%	5,856	127	141	42,400	11,949	11.59	11.27	31.13%	64.72%
Apr-10	30	65,887	1,766	64,121	2.68%	5,573	133	151	42,400	11,757	11.82	11.51	30.62%	60.60%
May-10	31	69,793	2,993	66,800	4.29%	5,920	140	117	42,400	11,851	11.79	11.28	30.38%	80.18%
Jun-10	30	68,101	1,847	66,254	2.71%	5,745	135	138	42,400	11,688	11.85	11.53	30.80%	68.54%
Jul-10	31	67,677	1,878	65,799	2.77%	5,604	127	143	42,400	11,514	12.08	11.74	31.27%	63.61%
Aug-10	31	69,752	1,923	67,829	2.76%	5,813	136	136	42,400	11,309	12.00	11.67	31.83%	68.94%
Sep-10	30	67,593	1,990	65,603	2.94%	5,714	137	131	42,400	11,517	11.83	11.48	31.26%	71.66%
Oct-10	31	70,598	1,843	68,755	2.61%	6,009	141	146	42,400	11,782	11.75	11.44	30.56%	64.99%
Nov-10	30	67,833	1,944	65,889	2.87%	5,782	135	142	42,400	11,848	11.73	11.40	30.38%	66.35%
Dec-10	31	69,799	1,973	67,826	2.83%	6,047	141	152	42,400	11,893	11.54	11.22	30.27%	61.72%
Total		816,248	24,992	791,256		69,634								
Average		68,021	2,083	65,938	3.06%	5,803	135	138	42,400	11,791	11.73	11.37	30.63%	67.78%
Max		70,598	3,030	68,755	4.37%	6,206	142	152	42,400	12,394	12.08	11.74	31.83%	80.18%

Density Figure obtained from Texaco - 0.8526KG/L

Colorific Heat Value of fuel obtained from Texaco 42400 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 = Gross Generation /Total Auxiliary

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

10. PETITE MARTINIQUE ENGINE SUMMARY:

DECEMBER 2010

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	488	256	0.0	0.0	45988.0	4120.2	65.6	100	0.0	0.0	0.4	36.1	41140.5	11.1	8.8
Cat. 2	256	487	0.0	1.0	23811.0	1926.8	34.4	99.9	0.0	0.1	0.4	35.6	37025.2	12.4	9.8

11. PETITE MARTINIQUE LUBE OIL STATUS:

DECEMBER 2010

Engine No.	Make-Up	Oil Change	Usage Rate (%)	Texaco URSA Super Plus X 15 W 40
Lister 1	21	0	1.50	21
Cat. 2	0	10	0	10
TOTAL	21	10	1.50	31

12. PETITE MARTINIQUE FUEL DATA:

Month	Texaco Fuel Received (US Gals)	Fuel Used (US Gals)	Percent Difference
January	8,954	6,206	-44.28
February	6,071	5,365	-13.16
March	5,663	5,856	3.30
April	5,659	5,573	-1.54
May	7,322	5,920	-23.68
June	4,410	5,745	23.24
July	5,965	5,604	-6.44
August	4,618	5,813	20.56
September	5,617	5,714	1.70
October	6,695	6009	-11.42
November	7,010	5,782	-21.24
December	7,173	6,047	-18.62

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

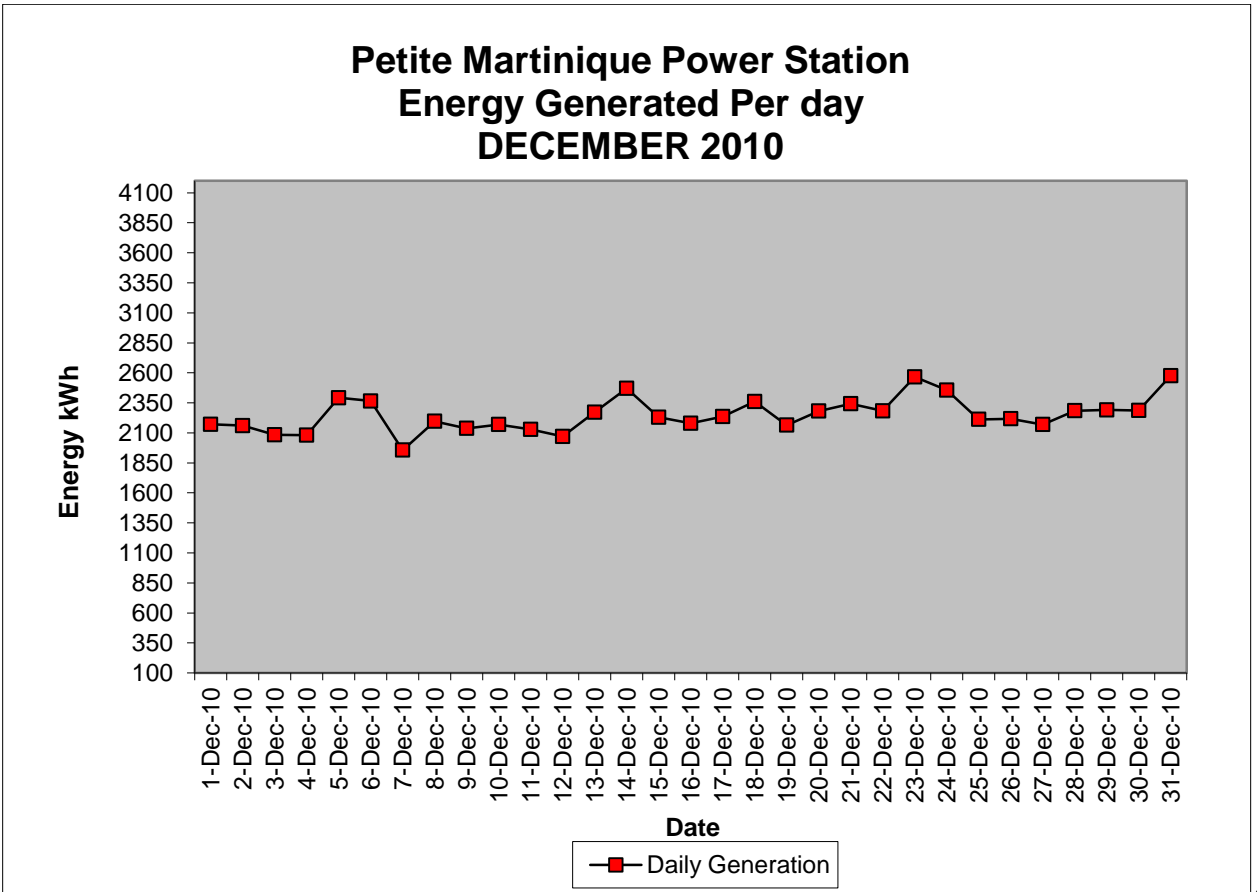


Figure (I) - Energy Generated

Petite Martinique Power Station Maximum and Minimum Load Variation DECEMBER 2010

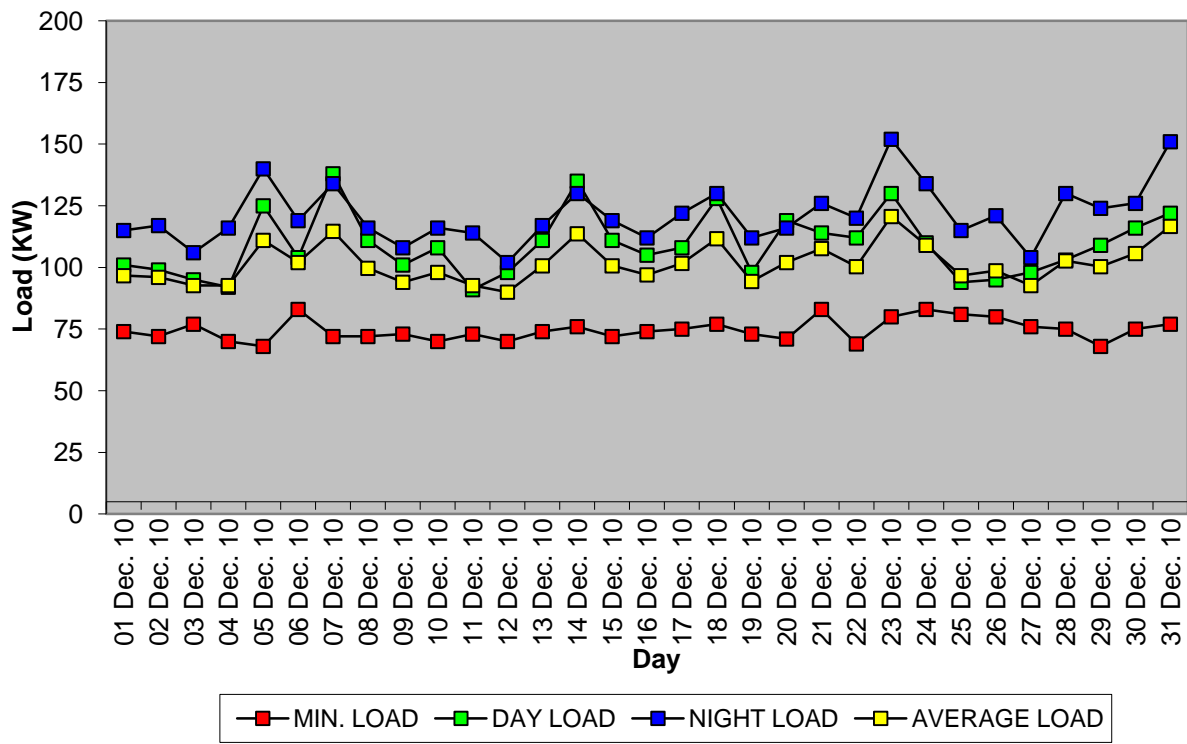


Figure (II) - Load Variation

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December saw the Fleet Mechanics as well as participants from Carriacou and Generation undertake Diagnostic and Troubleshooting training in the International trucks. There were a number of minor defects on the light duty vehicles, but generally the month was good from the maintenance perspective.

Table 1: Fleet Scorecard

	Oct	Nov	Dec
Overall Availability	94.52%	93.92%	93.46%
Large Vehicle Availability	81.23%	80.16%	81.38%
Total Miles Travelled	29,407	28017	26489
Number of Vehicle Accidents	5	3	3
Number of Breakdowns	3	1	0
Personnel Injuries	0	0	0
Average Vehicles Washed/Day	8	8	7

VEHICLE STATUS:

Digger Derricks:

SL93

Truck had a minor overheating problem which was traced to a defective coolant filter and a defective fan clutch assembly. Vehicle was available for most of the month.

SL210

The replacement rear springs arrived late in the month and were fitted to the vehicle. The A/C was also repaired.

SL218

This truck had a non-operable outrigger early one morning. This was corrected and the vehicle was available throughout the month.

Bucket Trucks:

TM772

This vehicle remained unavailable for the month. Investigations into the inoperable aerial device continued with assistance from Argo American.

SL95

The replacement gearbox was delayed in shipping and is expected to arrive early in the next month.

SL143

Hydraulic leaks at the bucket were corrected on this vehicle during the month.

Pole Truck:

SL41

This vehicle was available during the month.

Utility Trucks:

TV490

Body repairs were conducted on this vehicle to address water ingress through the roof. Complete repairs and spraying was done on the vehicle and the seats were re-upholstered.

Light Trucks & SUV's:

TV364

This vehicle returned from body refurbishment during the month. Additionally the seats were re-upholstered.

TV365

Broken hand brake cable was replaced during the month.

TV367

A broken front differential was replaced on this vehicle during the month.

TAA419

This vehicle was brought in for an overheating condition. This was traced to a crack in the cylinder head. At present a replacement cylinder head is being sourced to repair the vehicle.

TAC317

This vehicle had a broken left front shock absorber replaced as well as the right front shock. The turbocharger seal is leaking oil and therefore the turbo would require replacement in the near future.

TAC946

This vehicle remains unavailable due to the damaged front differential. A replacement is being ordered.

TAD418

Had all its brakes replaced during the month. The ABS sensor for the left rear wheel was also refitted after it was torn off.

TAE161

Had its brakes replaced during the month as well.

VEHICLE SERVICES:

3,000 MILE	TO440
	TAC317

TYRE SERVICES:

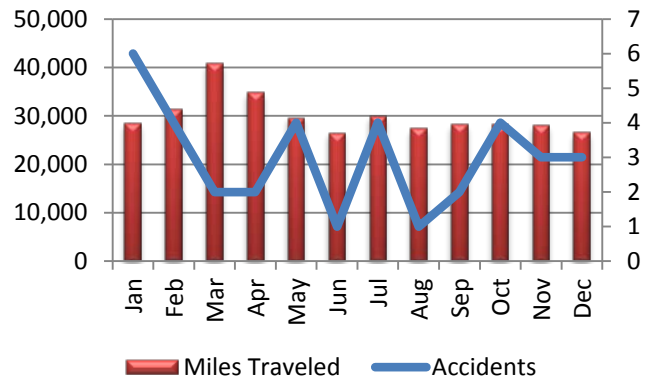
Tire Repairs	Equipment	No. of Tires
Tire Replacement	TM772	1
	TO20	1
	TO773	3
	TS905	1
	TV365	1
	TO20	6
	TO440	4
	TV365	2
	SL82	2
	SL199	2
	SL218	6
	TAC317	4
	TAE161	4

VEHICLE BREAKDOWNS:

There were no breakdowns this month.

VEHICULAR ACCIDENTS:

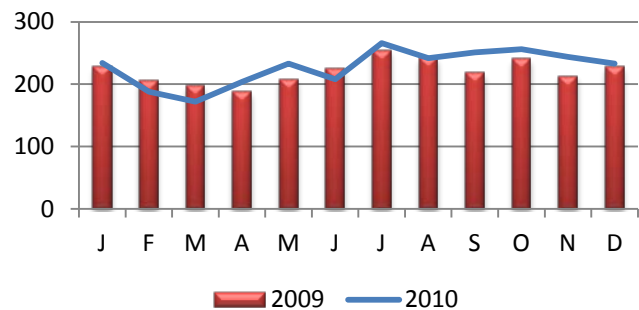
There were three vehicular accidents in the month. TAD69 hit another vehicle whilst passing along the Frequente main road. TAE163 hit another vehicle whilst overtaking in Dunfermline, St. Andrew's. TAD 976 was also involved in an accident in December. For the year to date we have logged 359,261 miles and recorded 36 vehicular accidents, an average of 9,979 miles per accident.



VEHICLE WASHING:

Vehicle washing during the month proceeded as normal with 233 vehicles washed averaging seven (7) vehicles washed per day at a cost of just over \$5,950.00.

The graph illustrates the number of vehicles washed per month and a comparison with 2009.



PERSONNEL:

There were no personnel accidents for the month. All Fleet personnel attended four days training on the International Trucks.

Senior Mechanic Anthony Lorainey had seven day's annual vacation during the month.

Fleet Mechanic Kevin Da Breo had five days annual vacation during the month.

Fleet Mechanic Lester Noel had four days uncertified sick leave in the month.

CARRIACOU & PETITE MARTINIQUE:

SL55

This truck developed an engine defect when water mixed with the lubricating oil in the sump. An overhaul kit has been ordered to repair the vehicle. The other vehicles were available during the month.

