THE JAMAICA PUBLIC SERVICE CO. LTD.

ANNUAL TARIFF ADJUSTMENT

SUBMISSION FOR 2012

April 3, 2012

Preamble

This submission is made in relation to the annual Performance-Based Rate-Making (PBRM) tariff adjustment filing for 2012, in accordance with the All Island Electric Licence 2001 (the Licence), Schedule 3, section 4, which states:

> "The Licensee shall make annual filings to *the Office* at least sixty (60) days prior to the Adjustment Date [June 1, 2012]. These filings shall include the support for the performance indices, the CPI indices, and the proposed Non-Fuel Base Rates for electricity, and other information as may be necessary to support such filings…."

In accordance with the Licence and the OUR's September 18, 2009 Determination Notice, the 2012 annual non-fuel tariff adjustment will incorporate changes in relation to inflation, foreign exchange and the X factor; but it will not include any adjustments for the Q factor.

Additionally, we did not have any natural disasters or other qualifying events under the Z-factor mechanism, so this filing does not contemplate any Z-factor adjustment. However, it is important to note that there is still a dispute which is to be resolved before the Appeals Tribunal. If this matter were to be resolved in favour of JPS then a Z-factor adjustment could be applicable or an additional draw down from the Electricity Disaster Fund.

In relation to the 2012 annual tariff submission, we anticipate that the total bill impact of the adjustment in non-fuel tariffs, along with the adjustment to the Heat Rate target, will result in a decrease of approximately 0.7% for most customers given that fuel represents approximately 65% of the typical residential customer's total bill.

The result of the annual PBRM adjustment is that, there will be an increase in the base non-fuel rates of 2.09% on average for customers, which represents a real increase of 1.21% when one considers that the base foreign exchange rate is being reset from J$86.5:US$1 to J$87.5:US$1. The nominal increase reflects the allowed weighted average escalation adjustment factor of 4.81% which is reduced by the X factor (or productivity factor) adjustment of 2.72%. The complete details of the calculation of the 2.09% increase in the total non-fuel tariffs is provided in this document, as well as the details of the adjustment to the individual tariffs which comprise the revenue cap.

Glossary

ABNF	-	Adjusted Non-fuel base rate
CIS	-	Customer Information System
CPI	-	Consumer Price Index
EDF	-	Electricity Disaster Fund
GDP	-	Gross Domestic Product
GOJ	-	Government of Jamaica
GWh	-	Gigawatt-hours
IPP	-	Independent Power Purchase
kVA	-	Kilo Volt Amperes
kWh	-	Kilowatt-hours
Licence	-	The All Island Electric Licence 2001
MVA	-	Mega Volt Amperes
MW	-	Megawatt
MWh	-	Megawatt-hours
NWC	-	National Water Commission
O&M	-	Operating and Maintenance
OCC	-	Opportunity Cost of Capital
PBRM	-	Performance Based Rate-Making Mechanism
REP	-	Rural Electrification Programme Limited
RPD	-	Revenue Protection Department
T&D	-	Transmission & Distribution
TOU	-	Time of Use

Contents

Preamble i

Glossary ii

Section 1: PBRM Annual Adjustment

1.1 Overview 1
1.2 Current year annual inflation adjustment (dI – X) 2
1.3 Application of the annual price adjustment factor 3

Section 2: Fuel Cost Adjustment Factor – Heat Rate

3.1 Introduction 7
3.2 Resetting the heat rate target for 2012/13 7

Section 3: Fuel Cost Adjustment Factor – System Losses

3.1 System Losses – Details of 2011 Activities 8
3.2 System Losses Outturn – 2011 9
3.3 Loss reduction projects and initiatives 13
3.4 Factors Inhibiting 2011 Losses Outturn 16
3.5 2012 Planned loss reduction activities 18
3.6 JPS requests pertaining to System Losses 23

Section 4: Ensuring Quality of Service: The Q-Factor

4.1 Introduction 25
4.2 The Benchmark SAIDI, SAIFI and CAIDI 26
4.3 Past 5 year performance on SAIDI, SAIFI and CAIDI 27
4.4 Data collection methods 29
4.5 Improvements in Data Maintenance 30
4.6 JPS System Reliability Improvement Program 31
4.7 Adjustments to Reliability Indices 32

Appendix I: U.S. and Jamaican Consumer Price Indices 35

Appendix II: Estimated bill impact of annual tariff adjustment 37

Appendix III: Customer count information 38

Section 1: PBRM Annual Adjustment

1.1 Overview

According to Exhibit 1 in the Licence:

"The Non-Fuel Base Rate for each customer class shall be adjusted on an annual basis, commencing June 1, 2004, *(Adjustment Date)*, pursuant to the following formula:

$ABNFy = ABNFy_{-1} (1 + dPCI)$

Where:

$ABNF_y$	= Adjusted Non-Fuel Base Rate for Year "y"
$ABNF_{y-1}$	= Non-Fuel Base Rate prior to adjustment
dPCI	= Annual rate of change in the non-fuel electricity prices as defined below
PCI	= Non-fuel Electricity Pricing Index

"The annual PBRM filing will follow the general framework where the annual rate of change in non-fuel electricity prices (dPCI) will be determined through the following formula:

$dPCI = dI \pm X \pm Q \pm Z$

Where:

dI	=	the annual growth rate in an inflation and devaluation measure;
X	=	the offset to inflation (annual real price increase or decrease) resulting from productivity changes in the electricity industry;
Q	=	the allowed price adjustment to reflect changes in the quality of service provided to the customers; and
Z	=	the allowed rate of price adjustment for special reasons not captured by the other elements of the formula.

The dPCI above was modified on page 9 of the OUR's September 18, 2009 Determination Notice (Document No. Ele 2009/04 Det/03) as follows:

"The price cap will be applied on a global basis. This means the annual price adjustment factor will be applied to the tariff basket. The adjustment in each tariff will be weighted by an associated quantity for each element. The weighted average increase of the tariff basket should not exceed the annual price adjustment.

The base Non-Fuel tariffs shall be adjusted annually, as follows:

$b1 = b0 [1 + dPCI]$.

b0 =Base non-fuel tariff at time period t = 0

b1 = Base non-fuel tariff at time period t = 1"

1.1 Overview (Cont'd)

The OUR's Determination Notice further states that:

> "The inflation adjustment formula (dI) to be used during the 2009 – 2014 tariff period shall remain:
>
> $$\mathbf{dI = [0.76 * \Delta e + 0.76 * 0.922 * \Delta e * i_{US} + 0.76 * 0.922 * i_{US} + 0.24 * i_j]}$$
>
> Where:
>
> Δe = percentage change in the Base Exchange Rate
>
> i_{US} = US inflation rate (as defined in the Licence)
>
> i_j = Jamaican inflation rate (as defined in the Licence)
>
> f_{US} = US factor = 0.76
>
> f_I = Local (Jamaica) factor = 0.24"

1.2 Current year annual inflation adjustment factor (dI – X)

The annual adjustment allows JPS to adjust its rates to reflect general movements in inflation, improvements in productivity, changes in service quality, changes in the base foreign exchange rate and where applicable an adjustment for unforeseen occurrences beyond management control not captured in the other elements of the PBRM. The following outlines JPS' proposal in relation to the components of the dPCI and its application to the non-fuel tariffs for 2012.

The application of the annual escalation adjustment formula (dI - X) will result in an increase of 2.09% to the non-fuel tariff basket, derived using the following factors:

- Jamaican point-to-point inflation (i_j) as at February 29, 2012 of 7.9%, derived from the most recent CPI data[1] (see Appendix I);
- U.S. point-to-point inflation rate (i_{US}) as at February 29, 2012 of 2.87%, derived from the U.S. Department of Labor statistical data[2] (see Appendix I); and
- The 1.16% increase in the Base Exchange Rate (Δe) from J$86.5: US$1 to J$87.5: US$1.

Table 1.1 below sets out the details of the annual escalation adjustment factor that amounts to a 2.09% increase for 2012.

[1] Obtained from the Statistical Institute of Jamaica.
[2] Obtained from U.S. Bureau of Labor Statistics website, http://data.bls.gov/cgi-bin/surveymost

1.2 Current year annual inflation adjustment factor (dI – X) (Cont'd)

Table 1.1

Escalation Factor

Line	Description	Formula	Value
L1	Base Exchange Rate		86.50
L2	Proposed Exchange Rate		87.50
L3	Jamaican Inflation Index		
L4	CPI @ Feb 2012		180.3
L5	CPI @ Feb 2011		167.1
L6	US Inflation Index		
L7	CPI @ Feb 2011		227.7
L8	CPI @ Feb 2010		221.3
L9	Exchange Rate Factor	(L2-L1)/L1	1.16%
L10	Jamaican Inflation Factor	(L4-L5)/L5	7.90%
L11	US Inflation Factor	(L7-L8)/L8	2.87%
L12	Escalation Factor	0.76*(L9*(1+0.922*L11)+0.922*L11)+0.24*L10	4.81%
L13	Productivity (or X-Factor) Adjustment		-2.72%
L14	Escalation Adjustment net of X-Factor	(L12-L13)	2.09%

1.3 Application of the Annual Inflation Adjustment Factor

Based on Table 1.1 above, an annual adjustment factor of 2.09% can be applied to the total tariff basket. The adjustment in each tariff will be weighted, thus the adjustment across rates will be dependent on their relative weights in relation to the total tariff basket. The tariff basket, shown in Table 1.2 below, is derived using the 2011 billing determinants and the approved non-fuel tariffs arising out of the OUR's May 20, 2011 Determination Notice (see Table 1.4 for those approved 2011-12 tariffs).

Table 1.2

Total Non-Fuel Tariff Basket

Class	Block/ Rate Option	Customer Charge Revenue (J$'000)	Energy Revenue (J$'000)	Demand (KVA) Revenue (J$'000)				Total Demand Revenue (J$'000)	Total Revenues (J$'000)
				Std.	Off-Peak	Part-Peak	On-Peak		
Rate 10 LV	< 100 kWh	688,849	686,097	-	-	-	-	-	1,374,946
Rate 10 LV	> 100 kWh	1,151,730	13,526,679	-	-	-	-	-	14,678,409
Rate 20 LV		469,387	7,903,598	-	-	-	-	-	8,372,985
Rate 40 LV	STD	88,819	2,328,072	2,900,486	-	-	-	2,900,486	5,317,377
Rate 40 LV	TOU	7,431	480,178	-	29,210	213,808	209,450	452,468	940,077
Rate 50 MV	STD	6,739	1,349,519	1,005,432	-	-	-	1,005,432	2,361,690
Rate 50 MV	TOU	1,613	368,833	-	30,182	288,801	315,598	634,582	1,005,027
Rate 60 LV		4,752	1,047,711	-	-	-	-	-	1,052,463
Total		2,419,320	27,690,687	3,905,918	59,392	502,609	525,048	4,992,967	35,102,974

1.3 Application of the Annual Inflation Adjustment Factor (Cont'd)

The weights of each tariff, relative to the total tariff basket shown in Table 1.2, are shown in Table 1.3 below.

Table 1.3

Non-Fuel Tariff Basket Weights

Class		Block/ Rate Option	Customer Charge	Energy Charge	Demand Charge				Total
					Std.	Off-Peak	Part Peak	On-Peak	
Rate 10	LV	<100	1.96%	1.95%	0.00%	0.00%	0.00%	0.00%	3.91%
Rate 10	LV	>100	3.28%	38.53%	0.00%	0.00%	0.00%	0.00%	41.81%
Rate 20	LV		1.34%	22.52%	0.00%	0.00%	0.00%	0.00%	23.86%
Rate 40	LV - Std		0.25%	6.63%	8.26%	0.00%	0.00%	0.00%	15.14%
Rate 40	LV - TOU		0.02%	1.37%	0.00%	0.08%	0.61%	0.60%	2.68%
Rate 50	MV - Std		0.02%	3.84%	2.86%	0.00%	0.00%	0.00%	6.72%
Rate 50	MV - TOU		0.00%	1.05%	0.00%	0.09%	0.82%	0.90%	2.86%
Rate 60	LV		0.01%	2.98%	0.00%	0.00%	0.00%	0.00%	2.99%
TOTAL			**6.88%**	**78.87%**	**11.12%**	**0.17%**	**1.43%**	**1.50%**	**100.0%**

The non-fuel base rates approved in the 2011 Tariff Determination Notice that, were used to derive the 2011 non-fuel tariff basket, are shown in Table 1.4 below.

Table 1.4

OUR approved Non-Fuel Tariffs for 2011

Class		Block/ Rate	Customer charge J$/Month	Energy Charge J$/kWh	Demand Charge-J$/KVA			
					Std.	Off-Peak	Part Peak	On-Peak
Rate 10	LV	<100	300.00	6.28	-	-	-	-
Rate 10	LV	>100	300.00	14.36	-	-	-	-
Rate 20	LV		660.00	12.28	-	-	-	-
Rate 40	LV - Std		4,800.00	3.50	1,269.37	-	-	-
Rate 40	LV - TOU		4,800.00	3.50	-	53.88	558.52	714.68
Rate 50	MV - Std		4,800.00	3.32	1,142.44	-	-	-
Rate 50	MV - TOU		4,800.00	3.32	-	50.77	495.06	634.69
Rate 60	LV		1,800.00	14.73	-	-	-	-

The rates shown above are reproduced from Table 5.5 "Approved Non-Fuel Tariffs for 2011-12" in the OUR's Determination Notice – Jamaica Public Service Company Limited, Annual Tariff Adjustment 2011, Document No. Ele 2011002_Det 002. These non-fuel base rates were determined at a base exchange rate of J$86.5: US$1.

1.3 Application of the Annual Price Adjustment Factor (Cont'd)

Table 1.5 below shows how JPS proposes to apply the annual price adjustment factor of 2.09% to the individual non-fuel tariffs, with some level of tariff rebalancing between the rate types.

Table 1.5

Proposed Annual Non-Fuel Price Adjustment per tariff

Class		Block/ Rate Option	Customer Charge J$/Month	Energy Charge $/kWh	Demand Charge-J$/KVA			
					Std.	Off-Peak	Part Peak	On-Peak
Rate 10	LV	--100	7.500%	1.136%				
Rate 10	LV	> 100	7.500%	1.136%				
Rate 20	LV		7.500%	1.137%				
Rate 40	LV - Std		7.500%	1.137%	5.000%			
Rate 40	LV - TOU		7.500%	1.137%		5.000%	5.000%	5.000%
Rate 50	MV - Std		7.500%	1.137%	5.000%			
Rate 50	MV - TOU		7.500%	1.137%		5.000%	5.000%	5.000%
Rate 60	LV		7.500%	0.000%				

In accordance with the Licence, the weighted annual adjustment factor proposed by JPS should equate to the annual adjustment factor of 2.09%. Proof of this is shown in table 1.6 below.

Table 1.6

Weighted Non-Fuel Inflation Adjustment

Class		Block/ Rate Option	Customer Charge J$/Month	Energy Charge J$/kWh	Demand Charge-J$/KVA				Total
						Off-Peak	Part Peak	On-Peak	
Rate 10	LV	--100	0.15%	0.02%	0.00%	0.00%	0.00%	0.00%	0.17%
Rate 10	LV	> 100	0.25%	0.44%	0.00%	0.00%	0.00%	0.00%	0.69%
Rate 20	LV		0.10%	0.26%	0.00%	0.00%	0.00%	0.00%	0.36%
Rate 40	LV - Std		0.02%	0.08%	0.41%	0.00%	0.00%	0.00%	0.51%
Rate 40	LV - TOU		0.00%	0.02%	0.00%	0.00%	0.03%	0.03%	0.08%
Rate 50	MV - Std		0.00%	0.04%	0.14%	0.00%	0.00%	0.00%	0.18%
Rate 50	MV - TOU		0.00%	0.01%	0.00%	0.00%	0.04%	0.05%	0.10%
Rate 60	LV		0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
TOTAL			**0.52%**	**0.87%**	**0.55%**	**0.00%**	**0.07%**	**0.08%**	**2.09%**

1.3 Application of the Annual Inflation Adjustment Factor (Cont'd)

Table 1.7 below shows the proposed rates for 2012/13 after resetting the base exchange rate and after application of the proposed non-fuel price adjustments shown in Table 1.5.

Table 1.7

Summary of Proposed 2011/12 Non-Fuel Tariffs

Class		Block/ Rate Option	Customer Charge J$/Month	Energy Charge J$/kWh	Demand Charge-J$/KVA			
					Std.	Off-Peak	Part Peak	On-Peak
Rate 10	LV	--100	322.50	6.35	-	-	-	-
Rate 10	LV	> 100	322.50	14.52	-	-	-	-
Rate 20	LV		709.50	12.42	-	-	-	-
Rate 40	LV - Std		5,160.00	3.54	1,332.84	-	-	-
Rate 40	LV - TOU		5,160.00	3.54	-	56.57	586.45	750.41
Rate 50	MV - Std		5,160.00	3.36	1,199.56	-	-	-
Rate 50	MV - TOU		5,160.00	3.36	-	53.31	519.81	666.42
Rate 60	LV		1,935.00	14.73	-	-	-	-

While there is an overall 2.09% increase in the non-fuel tariffs, this includes the impact of the resetting of the base exchange rate from J$86.5:US$1 to J$87.5:US$1. The increase attributable to the resetting of the base exchange rate is already reflected in customer bills through the foreign exchange adjustment clause. Accordingly, the real impact of the annual price adjustment factor is an average increase of 1.21% in the non-fuel tariffs.

Please note that a detailed analysis of the non-fuel tariff adjustment for 2012/13 and the total bill impact for the typical JPS customer in each rate class has been provided in Appendix II. This demonstrates that the total bill impact for the typical JPS customer in each rate class ranges from a decrease of 0.63% to 0.79%. This decrease is primarily as a result of the resetting of the fuel rate to reflect a new regulatory heat rate target of 10,300 kj/kWh (revised down from the previous target of 10,470 kj/kWh) which will result in a 1.55% reduction in the fuel rate (all other things being equal). The resetting of the heat rate is explained in detail in Section 2: Fuel Cost Adjustment Factor – Heat Rate, which follows.

Section 2: Fuel Cost Adjustment Factor – Heat Rate

2.1 Introduction

Heat rate is one of two efficiency measures (the other being Systems Losses) that JPS must meet if it is to be allowed to recover its full cost of fuel. If the Company fails to achieve the stipulated regulatory efficiency targets it will experience an under-recovery of its fuel cost (i.e. a fuel penalty). For example, in 2010, JPS incurred a total fuel penalty amounting to US$13.4 Million (or J$1.2 Billion); which increased to a penalty of US$18.8 Million (or J$1.6 Billion) in 2011.

Heat rate is reported in kj/kWh and represents the efficiency with which fuel (chemical energy) is converted to electrical energy.

In the 2009 Tariff Review Determination Notice, the OUR stated:

> *"The Office has determined that the applicable heat rate for 2009/2010 is 10,400 kJ/kWh. Furthermore the Office has determined that the heat rate target will be reviewed and reset whenever there are new capacity additions to the national grid."*

Additionally, the OUR also made the following statements:

> *"The OUR is of the view that the objective for setting the heat rate target for the generation system is to ensure that customers are provided with fair and reasonable fuel rates by having a regulatory environment that provides JPS with the incentives to:*
>
> - *Improve the relative efficiency of converting chemical energy to electrical energy; and*
> - *Ensure economic dispatch of all available generation units.*

And further that:

> *"The OUR is of the view that the following principles should be applied in setting the heat rate target:*
>
> - *The target should hold JPS accountable for the factors which are under its direct control;*
> - *The target should adequately and realistically reflect the available and future (within the rate-cap period) generating fleet's capabilities and legitimate constraints."*

2.2 Resetting the heat rate target for 2011/12

Please recall that as part of the 2011 Rate Determination that the OUR approved an adjustment in the heat rate target to 10,470 kj/kWh, with the proviso that there was a special 120 kj/kWh adjustment for the West Kingston Power 65.5 MW project.

Additionally, we wish to note that based on the expected impact on the system-wide heat rate when West Kingston Power comes on line, we expect an overall improvement in the heat rate performance of 100 kj/kWh.

However, as a result of the need to take the Maggotty hydro power plant off-line for six months to facilitate the expansion of its generation capacity by 6.4 MW, we anticipate that the system-wide heat rate will actually deteriorate temporarily, with an annual impact of 50 kj/kWh.

2.2 Resetting the heat rate target for 2011/12 (Cont'd)

As a result of the aforementioned factors, JPS hereby requests that the heat rate target be revised from 10,470 kj/kWh to 10,300 kj/kWh for the 2012/13 period (i.e. 10,470 – 120 – 100 + 50). This adjustment to the heat rate target will result in a 1.55% reduction to the fuel rate (all other things being equal).

However, JPS wishes to note with concern, that, based on this new heat rate target, given the existing system losses target of 17.5% and our anticipated outturn for actual system losses during 2012 (as detailed in section 3 that follows), we anticipate a significant fuel penalty for 2012 (likely in excess of US$25 Million), if no other adjustment is made with respect to the fuel efficiency targets.

Section 3: Fuel Cost Adjustment Factor – System Losses

3.1 System Losses – Details of 2011 Activities

Introduction

Over the three (3) year period 2009 – 2011 the reduction in system losses has continued on a positive path as shown in the table 3.1 below.

Table 3.1: System Losses trend 2009 – 2011

Period	Net Gen	Sales	Energy Losses	System Losses
2009	4,214	3,204	1,010	24.0%
2010	4,137	3,187	950	23.0%
2011	4,136	3,215	921	22.3%

However, our recent experience and assessment of the environment over the past two years (2010 and 2011) suggests that the original targets for the 5 year plan 2009 – 2014 will not be achievable due to the factors mentioned under the section entitled *Factors inhibiting 2011 Losses Outturn,* which occurred primarily in 2011 but will have to be contended with in subsequent years. It is sufficient to summarize the challenge as being socio-economic and outside of the control of JPS, as the theft of electricity is in fact a crime and a national problem which occurs all across the island, committed by persons from all spectrums of society. Additionally, we find this challenge increasing in a recessionary environment where energy prices are increasing primarily as a result of rising oil prices. As such, we believe the implementation of the new 360 MW generation expansion project in 2015 will be key to bringing down electricity prices (by more than 30%) and allowing Jamaica to grow its way out of this high losses environment. It is obvious that until we fix the socio-economic problem of the country that we will continue to have a significant challenge with losses no matter what level of resources are thrown at this problem. Additionally, we wish to note that there are still an estimated 100,000 households all across the island living in informal settlements where they access electricity illegally and we require large security details to be able to access those communities to try to regularize such consumers.

3.1 System Losses – Details of 2011 Activities (Cont'd)

As such, even with an ambitious plan of spending US$30 Million per annum in an attempt to wire the homes of 10,000 households per year and building the related tamper-proof infrastructure, this project will be ongoing for 10 years. Table 3.2 below shows the expenditures on loss reduction activities over the past four (4) years, including the significantly increased activity post the September 2009 Tariff Determination.

Table 3.2: Loss reduction expenditure 2008 – 2011

	Actual				Plan
	2008	2009	2010	2011	2012
Expenditures (US$'000)					
O&M Expenses	1,801	2,867	13,410	14,237	14,213
Capital expenditure	4,763	6,250	13,719	19,277	15,823
TOTAL	6,564	9,117	27,129	33,514	30,036

Based on the above factors (and as specified in greater detail later throughout this section), we provide a revised and more realistic forecast for the 2012 – 2016 period in table 3.3 below:

Table 3.3: System Losses forecast for the period 2012 – 2016

Period	Net Gen	Sales	Energy Losses	System Losses
2012	4,135	3,245	890	21.5%
2013	4,135	3,270	865	20.9%
2014	4,135	3,289	846	20.5%
2015	4,259	3,429	830	19.5%
2016	4,387	3,574	813	18.5%

3.2 System Losses Outturn - 2011

Figure 3.1 gives an indication of the dashboard of key performance indicators for 2011.

Figure 3.1: Loss Reduction Activities – Key Performance Indicators for 2011

Account Investigations	2011		2011
	Target	Actual	Variance
Customer Audits	148,000	141,467	(6,553)
Energy Recovery (Mwh)	95,000	70,083	(24,917)
Strike Rate (%)	19%	20%	1%

Meter Centre Projects Scheduled in 2011	Completed	In Progress
Downtown Kingston	•	
Downtown Montego Bay	•	
Mona Commons	•	
Olympic Court	•	
Mothervie Lane	•	
New Nursery		•

RAMI Projects	Completed	Re-Scheduled for 2012
RAMI Arears Slated to be completed in 2011	5	9
Denham Town	•	
Mid Town	•	
Central Downtown	•	
Rose Town	•	
Tivoli Gardens	•	
Payne Land		•
Delacree		•
Whitfield Town		•
Greenwhich Farm		•
Central Village		•
Rema		•
Trench Town		•
Flankers/Providence Heights		•
Washington Mews		•

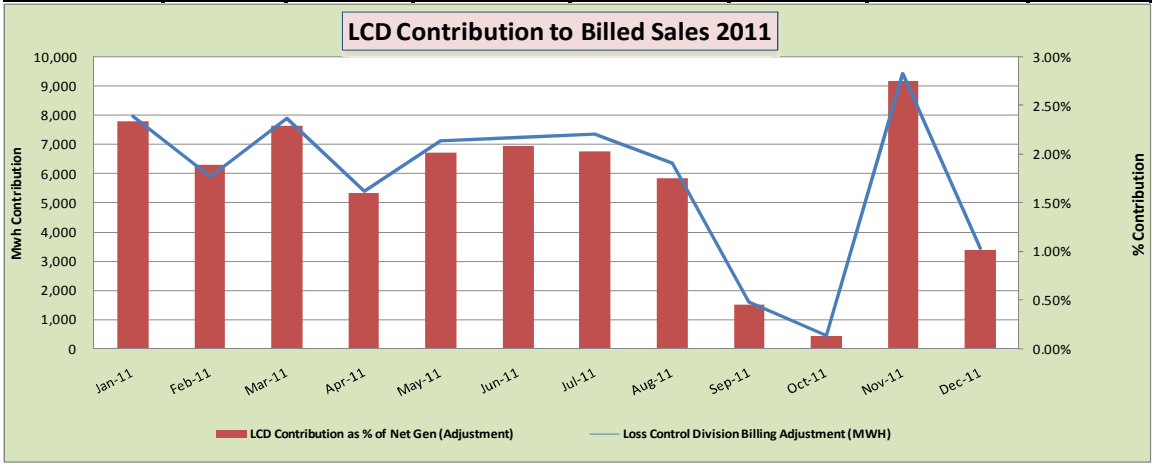
3.2 System Losses Outturn – 2011 (Cont'd)

JPS did not realize the planned 1% reduction in losses in 2011, the second year of its medium term loss reduction initiative; instead there was a reduction of 0.7%. This was due mainly to a cessation of losses activities in the months of August, September and December 2011 and the impact of conservation efforts by customers in response to the 30% increase in fuel prices during the year. The cessation of activities in the months mentioned were considered absolutely necessary to ensure the safety of our work crews as a result of the significant customer outcry pertaining to the installation of digital meters (which impacted our efforts in August – September) and the impact of the national elections in December (recall elections were not constitutionally due until 2012) which meant our usual security detail (including police support) was not available in December and there was the fear of escalated violence during this election period.

Using the 2010 net generation of 4,137 GWh, a 2% reduction in losses was targeted. This equated to approximately 83 GWh. Actual recovery arising from account audits resulted the recovery of 70 GWh, representing 1.7% of net generation. The performance for the last quarter of 2011 was significantly impacted by numerous external challenges, as mentioned briefly above and outlined in detail under the section "*Factors Inhibiting 2011 Losses Outturn*". This performance deterioration is evident from a review of Figure 3.2 below.

Figure 3.2: 2011 System Losses Recovery

	Month	Net Gen (MWH)	Net Billed Sales (MWH)	Loss Control Division Billing Adjustment (MWH)	Bill Sales excluding LCD Adjustments	System Loss prior to LCD Adjustments	LCD Contribution as % of Net Gen (Adjustment)	System Loss Reported
2011	Jan-11	341,555	257,455	7,986	249,469	26.96%	2.34%	24.62%
	Feb-11	310,382	243,063	5,876	237,187	23.58%	1.89%	21.69%
	Mar-11	344,102	269,086	7,894	261,192	24.09%	2.29%	21.80%
	Apr-11	336,388	257,525	5,404	252,121	25.05%	1.61%	23.44%
	May-11	353,722	274,125	7,135	266,990	24.52%	2.02%	22.50%
	Jun-11	346,744	266,951	7,233	259,719	25.10%	2.09%	23.01%
	Jul-11	362,182	280,292	7,340	272,952	24.64%	2.03%	22.61%
	Aug-11	360,855	275,744	6,345	269,399	25.34%	1.76%	23.59%
	Sep-11	349,355	263,533	1,586	261,947	25.02%	0.45%	24.57%
	Oct-11	350,725	262,202	428	261,775	25.36%	0.12%	25.24%
	Nov-11	342,362	269,290	9,430	259,860	24.10%	2.75%	21.34%
	Dec-11	338,507	256,221	3,427	252,794	25.32%	1.01%	24.31%
	2011 Total	**4,136,879**	**3,175,486**	**70,083**	**3,105,403**	**24.92%**	**1.70%**	**23.23%**



3.2 System Losses Outturn – 2011 (Cont'd)

Account Investigations

This involves the analysis of accounts to identify those with potential irregularities, followed up with field investigations. Suspected irregularities include meter tampering, direct connections, meter by-passes, etc. Investigation of 134,621 customer accounts yielded an overall recovery of 70 GWh. The work was organized around customer groups based on their consumption patterns:

1. Large Accounts – the Projects, Audit and Metering unit is responsible for accounts with multipliers greater than 1 and with monthly consumption greater than 1,000 kWh per month.

    - A total of 5,211 accounts were investigated, 636 of these accounts were discovered with irregularities, representing a strike rate of 12.2% and an overall recovery of 16 GWh.

2. Small Commercial Accounts – the Revenue Protection Department is charged with the responsibility of investigating and monitoring the commercial accounts with meter multipliers less than 1 and consumption less than 1,000 kWh per month.

    - A total of 6,082 accounts were investigated, 1,146 of these accounts were discovered with irregularities, representing a strike rate of 18.8% and a recovery of 15 GWh.

3. Residential Customer Accounts – the Commercial Process Control unit is charged with the responsibility of investigating and monitoring all residential customer accounts with a multiplier of 1.

    - A total of 128,878 accounts were investigated, 23,877 of these accounts were discovered with irregularities, representing a strike rate of 18.5% and an overall recovery of 38 GWh.

4. Central Intelligence Unit – this unit is charged with the responsibility of providing support to all the above departments. Strategies are developed in order to identify potential accounts for investigation; these strategies are piloted through a specialised investigation team.

    - A total of 1,124 accounts were investigated, 300 of these accounts were discovered with irregularities, represents a strike rate of 23.6% and recovery of 1 GWh.

The above approach, while necessary, is costly and labour intensive work that utilized approximately 200 personnel and cost over US$14M in O&M expenses in 2011. It is obvious that the same level of financial commitment and human resources will result in a diminishing return year over year as it becomes increasingly more difficult to find irregularities.

3.2 System Losses Outturn – 2011 (Cont'd)

Analysis of Billed Sales by rate class

In table 3.5 illustrated below, there is a demonstrable loss of 56 GWh and 30 GWh in billed sales between 2010 and 2011 despite an increase of 6,297 and 867 in the number of customers for RT10 and RT 20 accounts respectively. There was an increase of 25 GWh in billed sales for RT40 customers, while the number of customers increased by 62. There was no significant change in customer count or billed sales for the other rate classes for the comparative years of 2010 vs. 2011. Overall, this demonstrates that there has been an increase in conservation by customers, presumably due to the significant increase in fuel rates during 2011 and the recessionary environment. This conservation effort by normal customers in response to negative price signals is quite normal. However, users (those stealing electricity) would not likely be conserving since they are not receiving any price signal given that they are consuming for free. So, despite our efforts at capturing 70 GWh of electricity that would have otherwise been stolen, we experienced a 60 GWh decline in organic sales as demonstrated by table 3.5 below.

Table 3.5: Analysis of Billed Sales by rate class – 2011 vs. 2010

DATE	RT10		RT20		RT40		RT50		RT60		INT	
	Mwh	# of Customers	Mwh	# of Customers	Mwh	# of Customers	Mwh	# of Customers	Mwh	# of Customers	Mwh	# of Customers
2010	1,106,956	508,312	673,471	59,053	750,291	1,636	602,248	139	71,029	220	31,242	2
2011	1,051,220	514,609	643,615	59,920	775,583	1,698	607,273	147	71,128	246	26,774	2
Variance	(55,736)	6,297	(29,855)	867	25,292	62	5,025	8	99	26	(4,467)	-

Table 3.6 below demonstrates that organic sales (i.e. sales without the loss recovery adjustments) have been declining since 2009, falling by 1.9% in 2010 and 1.3% in 2011. It is obvious that in this difficult macroeconomic environment, combined with rising energy prices, sales would be declining and it is important to appreciate that this will negatively impact system losses which are reported as a percentage of net generation.

Table 3.6: Analysis of Organic Sales (2009 to 2011)

Year	Billed Sales with Adjustment (MWH)	Adjustment due to Energy Recovery (MWH)	Nominal Billed Sales without Adjustment (MWH)	Movement Year over Year
2008	3,129,903	20,982	3,108,921	
2009	3,231,465	26,391	3,205,074	96,153
2010	3,235,236	89,532	3,145,704	-59,370
2011	3,175,593	70,083	3,105,510	-40,194

3.3 Loss reduction projects and initiatives

Meter Replacement Project

JPS embarked on an initiative to replace approximately 30,000 electro-mechanical meters (or 5% of the population of meters) in 2011 which were originally installed prior to 1995. The average life of an electro-mechanical meter is typically 15 years after which it is expected to start degrading. Annual replacement of outdated meters is a normal mode of business for most utilities to help ensure overall metering accuracy over time. Replacement priority was given to those electro-mechanical meters along the highest loss feeders and concentrated urban areas in each parish. This was intended to aid in the losses imitative by way of improved billing accuracy after defected or degraded meters were replaced.

During 2011, 23,613 meter changes were completed, representing approximately 79% of the planned replacements. The remaining meters will be changed during 2012. The targeted meter changes in 2011 were not met due to the public outcry between August and September 2011 regarding high bills and adjustments. The OUR and JPS Board initiated an audit of the project as well as the suspension of the meter change project during that period. While this work stoppage lasted for a period of approximately two (2) months, upon resumption we observed many customers resisting to have their meters changed, which greatly hindered our effectiveness in this regard since the public outcry. It was observed that irregularities immediately subsided for these accounts, as it gave customers the opportunity to remove illegal abstractions before allowing JPS access. Table 3.7 below provides a summary of the meter replacement projects in 2011.

Table 3.7: Summary of meter replacement projects

Source of Recovery	Quantity
Adjustments Posted (due to illegal abstraction discovered during the meter change project). (kwh)	657,333
Forward Billing (kwh)	267,445
Total	**924,778**
Total Meter Changes	23,613
Percentage Completion	78.70%
Meters found with no test seals	2,943
% of meters found without test seals	12.50%

Residential Automated Metering Infrastructure (RAMI)

Electricity theft is a crime and, like many other criminal activities, its reduction and eradication requires a multifaceted approach including social intervention and the stimulation of economic activity. JPS, through its corporate social responsibility outreach, has expended a significant amount of resources in augmenting its loss reduction activities with social intervention projects but the Company is neither equipped nor has the resources to take on this challenge on its own.

3.3 Loss reduction projects and initiatives (Cont'd)

The RAMI is aimed at "sustainable" loss reduction efforts where anti-theft networks such as RAMI and Meter Centres are utilized and once completed show an immediate and long-term reduction in overall losses in that specific community. These projects aggressively target informal residential/inner city communities and clusters of informal commercial districts across the three largest "loss" parishes in Jamaica – Kingston, St. Catherine and St. James. These areas are known to be non-compliant and having a culture of illegal abstraction.

Results in 2011 confirm the RAMI projects are successful, once implemented, in reducing commercial losses within the specific communities. Unfortunately, these initiatives are very time consuming and capital intensive, due to the high level of planning, community intervention, home rewiring and certification and network construction required; but offer the best return over the long-term. One project can take up to a year to implement due to various external factors, including ensuring safe access to the community for our workers.

During 2011, JPS added approximately 6,500 customers to the RAMI network which, coupled with the loss reduction efforts in 2010, has increased the total regularized customers added to the JPS network to approximately 11,000 customers. The cut-over areas in 2011 include:

- Approximately 3,100 new customers in the Denham Town and Mid Town Communities of Kingston;
- Approximately 350 new customers in sections of Central Downtown Town to include Charles Street and adjoining areas. This immediately reduced the losses in the area by 220 MWh per month.
- Approximately 450 new customers in sections of Rose Town community.
- The Tivoli Gardens community was regularized in January 2011, with a total of 530 customers. Subsequent to this cut over period an additional 1,100 customers were also regularized during 2011.
- The Portmore Lane and Washington Mews communities were regularized which includes 616 RAMI installations. This includes 361 new customers and 255 existing customers converted to the RAMI via meter changes. Construction is now ongoing to connect small pockets of customers on the outskirts of these communities.

As at December 2011, the overall completed RAMI areas include Sea View Gardens, Old Harbour, Pitfour, Retirement, Hurlock, Tivoli Gardens, Denham Town, Rose Town and section of the Mid Town Project. Areas including Payne Land, Delacree, Whitfield Town, Greenwhich Farm, Central Village, Rema, Trench Town and Flankers/Providence Heights were all scheduled to be completed by December 31, 2011, however, due to a number of external challenges experienced which were beyond our control, they are now re-scheduled to be completed during 2012.

Energy Balance Project

The priority for 2011 has been the completion of the energy balance project and remote links with locations where relays presently exist.

3.3 Loss reduction projects and initiatives (Cont'd)

This initiative was integrated as part of JPS' routine operation to reduce energy losses on a sustained basis. The following was achieved in 2011:

(1) Energy balance - Remote energy balance communication link

a) The total JPS net generation metered locations is 27 of which 26 have remote communication. Only Constant Spring Hydro is incomplete;

b) There are 38 metered transformer locations of which 28 presently have remote links;

c) There are 111 metered feeder locations island-wide of these 85 have remote links.

(2) Substation feeder metering

a) The transformer at Martha Brae was replaced and another feeder added;

b) 22 sub-feeder metering links were completed to facilitate RAMI projects;

c) 18 circuits for secondary total metering were completed in 2011.

(3) CAMI (C & I) meter replacement/installation

a) 1,752 commercial meters were replaced in 2011 with AMI enabled meters to facilitate remote data acquisition.

Meter Centre Projects

As part of our ongoing efforts to reduce losses, JPS has committed to investing J$1.3 Billion over the period 2010 – 2015 in the implementation of meter centres island-wide. Under the meter centre project, areas in which JPS has traditionally faced operational challenges are identified and the overhead low voltage power lines (on which persons usually throw up wires) are replaced with high voltage tamper-proof power lines. The meters are also removed from residences and installed in tamper-proof cabinets (or meter centres) mounted on light poles. Customers are then connected directly from the meter centre thus eliminating the incidence of 'throw-ups' or illegal connections.

During 2011, J$52 Million was spent on installation of commercial and residential meter centres. The meter centres installed included:

- The implementation of 272 commercial meter centres in downtown Kingston, Montego Bay and St. Catherine.
- The installation of residential tamper resistant meter centres covering 1,000 customers Island-wide.
    - Six (6) residential tamper resistant meter centre projects covering 163 meter centres have been approved. The project for Mona Commons, Olympic Court and Mothervie Lane has been completed and customers cut over, while the New Nursery Project is still under construction.

3.4 Factors Inhibiting 2011 Losses Outturn

1. Interruption and loss in momentum of the construction and cutover processes in the 4th quarter of 2011 due to the public outcry against the use of digital meters and the subsequent concurrent audits by the regulator, as well as privately contracted auditors (PWC), of our metering and commercial operations. This led to a significant reduction in our losses recovery and audits and by extension a slow-down of the momentum that was gained during the previous three quarters. This is evident from figure 3.2 which showed a significant decline in recovery during the 4th quarter.

2. Reduction in the total ability to recover from back billing of fraud cases due to directives by the Regulator in the 4th quarter of 2011.

3. Migration of consumers from communities where network upgrades have reduced the capacity to steal electricity to neighboring communities not yet covered by the upgraded RAMI network.

4. An increase in the public resentment to the activities of JPS which manifests itself in a significantly higher level of customer resistance (or lack of cooperation), making the audit process significantly more difficult and dangerous for JPS workers.

5. The mode of customer illegal abstractions has changed especially for residential customers. These customers are now conducting their activities outside of normal operating hours i.e. during the nights and on weekends. This became evident when spot audits carried out by certain teams during these periods revealed a higher strike rate than normal. This has introduced additional risks to JPS employees as it requires working with law enforcement officers and these night audits are strongly resisted by customers, since it usually requires access to their property.

6. The OUR's request for JPS to accept new contracts from new customers at premises where irregularity was discovered. In these instances JPS does not recover from the irregularities discovered as the new customers distance themselves from the findings. Particularly in inner city communities we have seen a high incidence of irregularities being carried out by successive tenants (whom we believe are connected persons) at the same premises.

7. A number of anti-JPS organizations have been formed during the year that aggravated customers and led to further opposition and resistance to JPS workers (e.g. CURE).

8. Loss of Customers and customer conservation – An analysis of energy sales by rate class has shown a net reduction of approximately 14,000 customers between 2008 and 2011, and a reduction of 7,744 customers between 2010 and 2011, despite the adding of approximately 6,552 new customers through the RAMI programme. Residential customers declined by approximately 6,900 (1.3%), this was due to a significant number of users being removed from the system. The small commercial rate class declined by approximately 920 (1.52%). The overall loss of energy sales during 2011 was 84 GWh which is due primarily to conservation efforts by customers. While we have no difficulty with this in principle, this does have an notable impact on losses as currently reported as a percentage of net generation.

3.4 Factors Inhibiting 2011 Losses Outturn (Cont'd)

Additional challenges faced under the RAMI project include:

- Resistance by residents to allow access to complete construction. Residents demand to be given employment or else they will not allow us to enter their communities.
- Increases in the cost of RAMI conversion (circa 40%) in designated areas due the need for unplanned infrastructure upgrades necessary for GEI approval. Also, the expansion of planned RAMI projects into adjoining communities due to the migration of residents; this caused an escalation in the overall cost.
- Hostility and threats towards house-wiring contractors and theft of materials during the construction phase.
- Residents unwilling to participate in the transition process, or house wiring stages, prior to actual cut-over dates causing multiple delays in project implementation.
- The targeted number of customers for each area was not met, due to their migration to neighbouring communities that were not intended to be retrofitted with RAMI. This forces JPS to extend the boundaries of the targeted areas in an attempt to minimise the losses experienced in these adjoining communities.
- Some persons also discovered new avenues to stealing by extracting electricity from neighbouring communities or from street lights. This contributed to an overspending on some projects while others were delayed to ensure illegal abstraction opportunities were eliminated.
- Multiple demonstrations in the RAMI areas – customers fear of high electricity bills as alleged by residents in areas previously cut over; residents are unaware of the true monthly cost of electricity prior to becoming a legitimate JPS customer.

Impact of work stoppage on meter change project

Lost forward Billed Sales – The estimated opportunity cost is approximately 3,900 meter changes and lost billed sales of 30 MWh with accumulated effect over 12 months of 360 MWh. Expected increase kWh per meter change was determined by using the total increased kWh billed for all meters changed (May to August 2011) divided by the total meters changed and prorated per day (0.33 kWh).

Issue of missing Test Seals – Of the 23,613 meters changed thus far, a total of 2,943 (12.5%) meters have been discovered without a test seal which is a key indicator that the integrity of the meter has been compromised. This further restricts the ability to meet the losses target as a missing test seal is deemed to be a fraudulent act and JPS is not back-billing for this irregularity irrespective of the customers' consumption pattern after the meters have been changed en bloc.

Access Issues – Since the public outcry and the OUR intervention, customers have increased their resistance in allowing JPS access to change targeted meters. This is a direct result of the OUR intervention and audit coupled with the high electricity cost. This has resulted in the need to make multiple visits to customer locations in order to have meters changed; this has affected the recovery process and resulted in increased O&M costs. A total of 2,663 scheduled meter changes were not done due to:

3.4 Factors Inhibiting 2011 Losses Outturn (Cont'd)

1. Refusal of access to premises by residents;
2. Customers not making themselves available for meters to be changed;
3. Multiple rescheduled appointments.

It is important to note that the current regulation does not provide for any customer penalties for meter tampering (including missing test seals). We believe this is required to discourage customers from tampering with their meters are we are seeing a high incidence of missing test seals and broken meter seals in general. The broken meter seals makes it easy for customers to remove their meters at nights (and to bridge the electricity supply) or employ other tactics that cause their meters to under-register their true electricity consumption.

3.5 2012 Planned loss reduction activities

The main objective of the loss reduction programme is to reduce system losses by 0.8% to 21.5% by the end of 2012 through the following strategies:

- Improving identification and measurement of losses for high-loss feeders/ load centers.
- Implementing sustainable commercial processes that result in reduction of non-technical losses:
  i. theft resistant network, residential AMI & AMI for priority accounts;
  ii. audits and investigations to be proactive in detecting and controlling losses (with a greater focus on night audits).
- Improved level of intelligence in identifying factors driving losses:
  i. Support targeted inspection of irregularities and improved strike rate through the use of intelligence;
  ii. Analysis of revenue assurance process;
  iii. Identification of high-loss feeders/ load centers.

The above-mentioned strategies will be supported by the following main initiatives:

- Proactively manage non-technical system losses by recovering at least 94 GWh of energy in 2012.
- Continue installation of total meters by the installation of metering points to cover all red zones by the end of 2012.
- Continue line & metering upgrade in high-loss areas through the propagation of AMI projects in residential and commercial zones where the cost benefit analysis is most justified.
- Improving the revenue assurance process by continuing the development and institutionalization of operating standards specifically relating to metering installations and integrity of the energy sales process.
- Improving the capacity of the loss control organization to manage meter data and the demands of an increasing residential and commercial AMI infrastructure.

3.5 2012 Planned loss reduction activities (Cont'd)

Improving the identification and measurement of losses

- JPS will continue improving its ability to identify and measure energy losses throughout the spectrum of power delivery activities. The primary focus for 2012 will be:
  i. Continuation of the meter degradation replacement project. This involves the replacement of meters identified as under registering by 1% or greater. It is expected that approximately 24,000 electro-mechanical meters will be replaced with digital electronic meters plus a carry-over of approximately 6,000 meter changes from 2011;
  ii. Introduction of meter accuracy certification for all meter replacements/ installations;
  iii. Replacement of old energy balance meters and complete remote communication link;
  iv. Installation of a further 600 AMI meters for large & medium-sized customers;
  v. Installation of revenue class meters to cover 10 high loss areas (or red zones).

Residential automatic metering infrastructure (RAMI)

This is aimed at sustainable loss reduction where anti-theft networks are utilized and once completed, show an immediate and long-term reduction in overall losses. These projects are targeted at residential/inner city communities, while meter centres are geared mainly towards informal residential and commercial districts.

The main objectives of the 2012 RAMI projects are:

- Installation of approximately 14,000 RAMI meters in Hannah Town, Fletchers Land, Winters Pen, Norwood,Waltham Park and South West St. Andrew to recover approximately 34 GWh of energy.
- Completion of projects carried over from 2011.
- Ensure RAMI projects are completed within the capital budget of US $12 Million.
- Installation of 400 meter centers (300 residential and 100 commercial).
- Educate inner city communities about energy conservation, usage and value.

Audit investigations

The Commercial Process Control unit, RPD and Large Accounts unit primary roles are to conduct targeted audits, inspections and corrections of customer accounts with the aim of protecting the Company's revenues. The main strategies for 2012 include:

- Improved ability to detect irregularities.
- Audit or investigate at least 118,000 accounts by the end of 2012, with a projected strike rate of 19%, with an expected yield of approximately 61.5 GWh in recovered energy.

3.5 2012 Planned loss reduction activities (Cont'd)

- Incorporate adherence to policies and procedures relating to field audits as a performance measurement criteria.

Losses Intelligence and Analysis

The Intelligence unit is charged with the responsibility of identifying the internal and external factors negatively affecting billed sales along with the intelligence arm to support targeted inspection and investigation of customers account. The Intelligence unit has embarked on different strategies and methodologies in performing data analysis to determine which accounts/locations are to be targeted for investigations. Some of these desktop analyses include:

- **Collateral Analysis –** It has been discovered that customers who are found to have deliberately sought to defraud the company by illegal abstraction may have or will in the future tendencies to be repeat offenders. A detailed investigation is done on such a customer to identify any other accounts that may be associated with the individual and investigations are carried out.
- **Feeder Based Analysis –** This involves the utilization of feeder data information including energy delivered along with billed sales coupled with the GIS data to quantify losses on each feeder and by extension along different circuits along the feeder. This information is useful to determine which areas resources should be focused.
- **Trend Analysis** – This tool caters to detecting any deviation in average yearly or monthly consumption over a six-year period. A comparison is done on the basis of customer type, rate class and multiplier class. The aim of this is to identify and compare data for similar modes of operation as best as possible. Accounts with irregular variations are prioritized for investigation.
- **Load Factor Analysis** - The purpose of this analytical tool is to compare an estimated kWh for each Rate 40 and 50 customers with what is registered. The estimated kWh is computed using an assumed load factor of 60%. A 30-day period is assumed which implies 720 hours duration of operation. Using a benchmark percentage variance between estimated kWh and actual kWh of 50% accounts are selected for investigation that fall below this benchmark.
- **Irregularity Mailbox** – Customers are encouraged to call JPS with any insight of fraudulent activities by any consumer on the electricity grid. This information is stored, analyzed and used as a strategy for selecting accounts for investigation.

Some of the main objectives of 2012 include:

- Development and institutionalization of operating standards and procedures for the revenue assurance process, specifically relating to metering installations and integrity of the energy sales process.
- Automation of various customer accounts/groups manual data collation metrics to increase the efficiency of data analysis.

3.5 2012 Planned loss reduction activities (Cont'd)

- Feeder based and route sales analysis and trending, which involves identifying routes which have shown flat or downward trends in sales.
- Utilisation of available data from the metering projects to further quantify areas where there are concentrated losses to better focus resources to mitigate same. *See feeder based initiatives below*

Feeder based loss reduction strategy

Figure 3.3: Highest Losses by Feeders – Graphical display

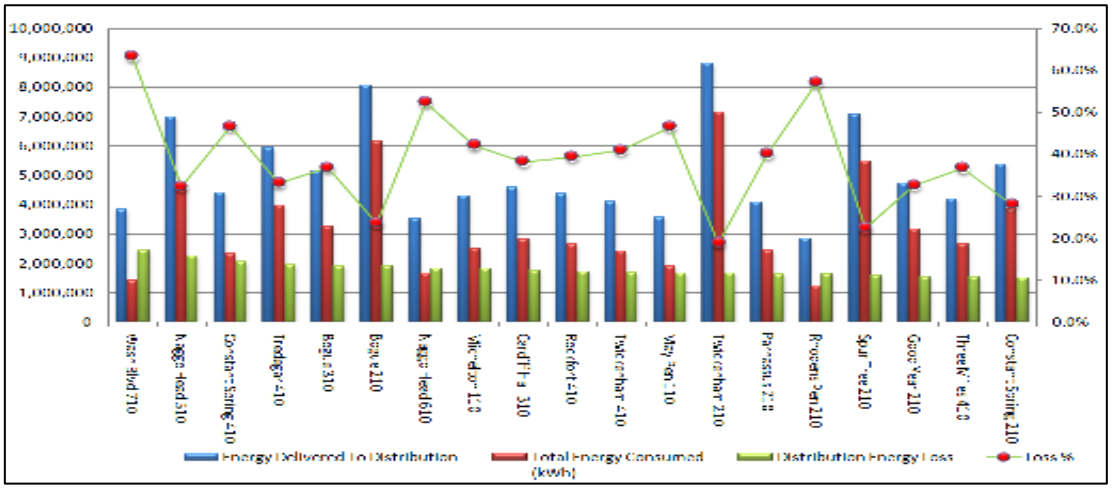


Table 3.8: Highest Losses by Feeders

Distribution Feeder	No. Of Cust	Energy Delivered To Distribution	Billed Consumption kWh					Total Energy Consumed (kWh)	Distribution Energy Loss	Loss %
			Rate 10	Rate 20	Rate 40	Rate 50	Rate 60			
Wash Blvd 710	5959	3,847,129	915,267	261,149	176,967	0	57,968	1,411,350	2,435,779	63.3%
Naggo Head 510	12413	6,995,103	2,873,866	874,747	887,318	0	97,394	4,733,324	2,261,779	32.3%
Constant Spring 410	9083	4,409,069	1,398,833	360,059	438,897	0	153,310	2,351,098	2,057,971	46.7%
Tredegar 410	7562	5,938,536	2,002,635	800,569	593,722	457,829	114,379	3,969,134	1,969,402	33.2%
Bogue 310	12394	5,155,679	1,561,383	874,508	605,053	52,618	158,644	3,252,205	1,903,473	36.9%
Bogue 210	13856	8,066,045	2,158,279	876,108	1,860,950	1,120,234	148,580	6,164,151	1,901,894	23.6%
Naggo Head 610	11545	3,513,444	1,171,388	209,436	201,692	0	89,996	1,672,513	1,840,932	52.4%
Michelton 110	10298	4,306,608	1,151,075	639,235	594,858	0	103,047	2,488,215	1,818,393	42.2%
Cardiff Hall 310	15475	4,589,825	1,714,672	569,150	471,375	0	77,929	2,833,125	1,756,700	38.3%
Rockfort 410	6422	4,378,842	1,183,937	764,648	540,093	62,957	99,378	2,651,012	1,727,830	39.5%
Twickenham 410	4883	4,107,362	746,509	349,118	740,887	504,420	82,073	2,423,007	1,684,356	41.0%
May Pen 110	12562	3,573,781	1,197,444	357,181	230,226	0	122,644	1,907,495	1,666,286	46.6%
Twickenham 210	16109	8,825,708	2,370,574	911,543	2,005,354	1,642,108	231,418	7,160,996	1,664,711	18.9%
Parnassus 210	6607	4,078,750	718,401	594,889	1,109,522	0	18,203	2,441,015	1,637,735	40.2%
Rhodens Pen 210	2988	2,852,568	445,081	386,383	308,815	33,040	50,950	1,224,269	1,628,299	57.1%
Spur Tree 210	15536	7,077,203	1,618,044	863,848	2,294,924	629,520	80,092	5,486,429	1,590,775	22.5%
Good Year 210	12339	4,726,041	1,279,133	781,313	589,905	330,372	201,600	3,182,324	1,543,718	32.7%
Three Miles 410	3508	4,192,264	501,787	215,831	276,112	1,624,214	33,712	2,651,655	1,540,609	36.7%
Constant Spring 210	10270	5,365,202	2,212,864	373,623	1,144,650	0	122,771	3,853,908	1,511,294	28.2%
Michelton 210	4168	3,730,228	446,252	207,985	727,676	864,231	54,849	2,300,994	1,429,234	38.3%
Grand Total	**193,977**	**99,729,388**	**27,667,423**	**11,271,323**	**15,798,995**	**7,321,543**	**2,098,935**	**64,158,219**	**35,571,169**	**35.7%**

3.5 2012 Planned loss reduction activities (Cont'd)

JPS' current sustainable loss reduction efforts such as meter centres and RAMI projects require significant time and capital to address. To achieve a 4% loss reduction as targeted over the next five years (refer to table 3.3) requires improved logistics management from start to finish, from the beginning of the community outreach meetings, through to the construction and implementation of the RAMI solutions, including better coordination with the police force to be able to implement 10,000 RAMI solutions per annum. Our expected improvement in results is also dependent on our assumption that energy prices will fall substantially in 2015 upon completion of the new 360 MW generation expansion project, which will also facilitate notable sales growth going forward.

The ability to manage and efficiently implement loss reduction solutions is tied up in understanding the factors that contribute to energy losses. The institution of a feeder metering program is a step in the right direction in understanding where energy losses are greatest. With staggering levels of losses being reported on feeders across the island this gives rise to the need to take our initiative of understanding feeder losses a little further. The proposal to further segment feeders and the associated customer base serves this very purpose. With more knowledge of losses at the sub-feeder level, we will be able to more efficiently allocate limited resources in curtailing energy losses. The feeder loss segmentation solution addresses this need completely, although we understand the implementation process for RAMI solutions will take much time and effort due to the social-economic challenges and related logistical challenge.

Feeder loss segmentation solution:

This effort is geared towards assessing losses and restricting it to a geographical space and a specific customer base. High losses feeders are selected for this approach.
Direct benefits of feeder loss segmentation solution:

- Efficient allocation of resources;
- Leveraging of feeder loss measurement;
- Stratified customer base;
- Easy identification of areas with persistent and pervasive losses for anti-theft solutions.

Other Feeder based initiatives:

Anti-Theft Solution
As a short term solution areas deemed to be orange zones, these are areas with medium levels of volatility and wide spread theft of electricity are targeted for measurement of energy loss and subsequently implementation of anti-theft solutions. Once again this effort is driven primarily by feeder loss data generated.

Commercial blitz campaign 2012

The blitz campaign targets commercially clustered areas on high loss feeders for loss measurement and subsequently the employment of a comprehensive investigative approach aimed at reducing energy losses.

3.5 2012 Planned loss reduction activities (Cont'd)

This approach presents an opportunity to quickly acquire the following objectives:

- Ascertain loss recovery;
- Reduction in net generation;
- Increased presence in the public domain.

Methods include:

- Door-to-door investigations;
- Removal of service lines;
- Replacement of under-utilized transformers.

3.6 JPS requests pertaining to System Losses

Firstly, it is important to note that in the 2010 Annual tariff submission, the Company made the following statements in section 4.4:

> *"Despite the projected improvement in system losses during 2011, JPS projects that it will under-recover on fuel by US$17.1 Million. This projection is conservative and could realistically be exacerbated if the current volatility in oil markets buoy oil prices at current levels or drive them higher."*
>
> *"The lowering of the target therefore will only serve to amplify the fuel revenue under-recovery of the Company and so deprive and deplete it of revenues needed to maintain the momentum on losses and address other customer issues."*

Sadly, we must inform that the Company in fact experience a penalty of US$18.8 Million in 2011, as a result of the 30% increase in oil prices (which magnifies the impact of any penalty) and the fact that we achieved an actual system losses performance of 22.3% compared to our estimate made last year of 21.4% (see table 4.10 of the prior year annual submission). Of course, we have explained in great detail why we are not in full control of system losses, painstakingly identifying all of the external factors that have mitigated our performance in this regard.

Given the expectation that the heat rate target will be revised to 10,300 kj/kWh and based on our expected system losses outturn for 2012, we now anticipate that the fuel penalty will grow to more than US$25 Million in 2012, which would only create severe financial difficulty for the Company rather than incentivising efficiency improvement as it relates to system losses. This is of grave concern to the Company considering the arbitrary nature by which the regulatory target was set and the fact that absolutely no consideration appears to be given to the significant challenges being experienced in the social-economic environment and its impact on system losses. Additionally, no consideration is being given to the impact of rising oil prices on the penalty itself.

In this regard, we must ask the OUR to give consideration to three requests which we believe are critical to ensuring the viability of the utility company. We believe this is a credible request given that one of the OUR's primary objectives is to ensure that it balances the interests of customers and the utility and a bankrupt utility will not be able to serve any customer.

3.6 JPS requests pertaining to System Losses (Cont'd)

To explain the magnitude of the fuel challenge, with a fuel bill in 2012 of US$65 Million per month, and the importance of a fair pass through mechanism to ensure the utility remains viable, consider the following facts pertaining to 2011 financial performance of the Company. JPS made a profit for the entire year of US$34.3 Million from approximately US$1.2 Billion in operating revenues, where the cost of fuel alone was approximately US$770 Million. However, included in that profit of US$34.3 Million were two items not available for normal operations, namely the revenues for the self insurance fund (approximately US$5 Million) and the revenues for the special JEP LC (approximately US$3.5 Million). Accordingly, the Company's adjusted profit could be viewed as US$25.8 Million. This is clearly marginal when one considers the level of receivables that the Company is necessarily carrying in this difficult macro-economic environment and considering that the monthly fuel bill (which must be settled within 30 days) is now US$65 Million per month and climbing.

It is in this context that we request consideration for the following changes:

(1) **Revising the System Losses target to 18.5%** – We estimate that the impact of this change would be minimal on the fuel tariff but it would reduce the potential penalty during 2012 by approximately US$5 Million. Given, the expected reduction in the heat rate target, there would still be an overall 0.39% reduction to the fuel tariff after allowing for this adjustment.

(2) **Setting a maximum Fuel Penalty/Reward** – JPS believes the fuel pass through is fundamental to the viability of the business given that fuel represents more than 65% of total costs. JPS is not in the business of profiting on fuel costs but at the same recognises the importance of an incentive based system to encourage efficiency. However, we are concerned that the penalty/reward in its current form is far too punitive and would request that a reasonable cap be established of US$1.5 Million per month. This still sends a very strong signal to the utility while not exposing it to possible financial duress, bearing in mind that a maximum annual penalty of US$18 Million does represent more than 50% of the profit recorded for 2011.

(3) **Providing the gross up for taxes to the loss reduction funding** – we believe the objective of the 2009 Determination was to in fact fund the losses campaign by J$1.1 Billion per annum at the base exchange rate of J$89:US$1. However, the impact of taxation means that approximately one third of those funds are being lost to taxation. As a result, in 2011, approximately US$4.3 Million was not available for the purposes of supporting the loss reduction activities. We estimate that with an additional J$0.118 per kWh that we would be able to increase our fight against system losses by approximately US$4.3 Million.

In summary, while the current proposed adjustments to the fuel and non-fuel tariffs before taking the above requests into consideration would result in an overall bill reduction of 0.69% for the typical residential customer, we estimate that the three requests above would instead result in a total bill increase of approximately 0.42% but are vital to ensuring the continued viability of the utility company in Jamaica.

Section 4: Ensuring Quality of Service: The Q-Factor

4.1 Introduction

The third element under the PBRM is the Q-factor, i.e., the allowed price adjustment to reflect changes in the quality of service provided to customers. Specifically:

$$dPCI = dI \pm X \pm Q \pm Z$$

JPS and the OUR have agreed in principle that the Q-factor should meet the following criteria:

- The Q-factor should provide the proper financial incentive to encourage JPS to continually improve service quality. It is important that random variations should not be the source of reward or punishment;
- The measurement and calculation of the Q-factor should be accurate and transparent without undue cost of compliance;
- It should provide fair treatment for factors affecting performance that are outside of JPS's control, such as those due to disruptions by the independent power producers; natural disasters; and other *Force Majeure* events, as defined under the licence; and
- It should be symmetrical in application, as stipulated in the License.

In the 2004 Tariff Review Determination the OUR stipulated that the Q-factor should be based on three quality indices:

- SAIFI—this index is designed to give information about the average frequency of sustained interruptions per customer over a predefined area.

$$SAIFI = \frac{\text{Total number of customer interruptions}}{\text{Total number of customers served}}$$

(Expressed in number of interruptions (Duration >5 minutes) per year)

- SAIDI—this index is referred to as customer minutes of interruption and is designed to provide information about the average time that customers are interrupted.

$$SAIDI = \frac{(\Sigma \text{ Customer interruption durations})}{\text{Total number of customers served}}$$

(Expressed in minutes)

- CAIDI— this index represents the average time required to restore service to the average customer per sustained interruption. It is the result of dividing the duration of the average customer's sustained outages (SAIDI) by the frequency of outages for that average customer (SAIFI).

$$CAIDI = \frac{(\Sigma \text{ Customer interruption durations})}{\text{Total number of interruptions}} \text{ or } \frac{SAIDI}{SAIFI}$$

(Expressed in minutes per interruption *(Duration >5 minutes)*)

MAIFI – this index measures the average frequency of momentary interruptions per customer over a predefined area. Momentary interruptions are interruptions with duration less than or equal to 5 minutes.

$$MAIFI = \frac{\text{Total number of customer interruptions}}{\text{Total number of customers served}}$$

(Expressed in number of interruptions (Duration ≤ 5 minutes) per year)

4.2 The Benchmark SAIDI, SAIFI and CAIDI

The verified set of SAIDI, SAIFI, and CAIDI indices for 2010 will be used as the benchmark quality level. This is based on the past five year's performance which clearly demonstrates consistent improvements in quality of service to customers. These improvements are consistent with JPS reliability improvement strategies and solutions implemented over this period. Furthermore, it is determined that SAIDI, SAIFI and CAIDI should be improved by 2% in 2011 relative to the 2010 performance level and by 3% relative to the 2011 level, in each subsequent year until 2013. Accordingly, the targets are shown in Table 4.1 below. These targets are challenging, particularly on the T&D side given the significant challenge to maintaining and improving reliability due simply in the main to the difficult natural terrain that the network traverses and the attendance uncontrollable exposure this provides.

Table 4.1: The OUR Targets for the Q-factor 2011 – 2013

Year	Target SAIDI	Target SAIFI	Target CAIDI
2010	SAIDI2010	SAIDI2010	SAIDI2010
2011	SAIDI 2010*(1 – 0.02)	SAIFI 2010*(1 – 0.02)	CAIDI 2010*(1 – 0.02)
2012	SAIDI 2010*(1 – 0.05)	SAIFI 2010*(1 – 0.05)	CAIDI 2010*(1 – 0.05)
2013	SAIDI 2010*(1 – 0.08)	SAIFI 2010*(1 – 0.08)	CAIDI 2010*(1 – 0.08)

The OUR has stated, that, generally in PBRM, penalties are increased as performance worsens and are capped when a maximum penalty is reached and further, that, rewards for good reliability can be implemented in a similar manner. The OUR is of the view that this would provide an incentive for JPS to continue implementation of reliability improvement measures even after they have surpassed the minimum reliability threshold.

The OUR has determined that the quality of service performance should be classified into three categories, with the following point system:

- Above Average Performance (greater than 10% above benchmark) — would be worth 3 Quality Points on either SAIFI, SAIDI or CAIDI;
- Dead Band Performance (+ or – 10%) — would be worth 0 Quality Points on either SAIFI, SAIDI or CAIDI; and
- Below Average Performance (more than 10% below target) — would be worth -3 Quality Points on SAIFI, SAIDI or CAIDI.

The OUR further stated, that, if the sum of Quality Points for:

- SAIFI, SAIDI, and CAIDI is 9, then Q = +0.50%
- SAIFI, SAIDI, and CAIDI is 6, then Q = +0.40%
- SAIFI, SAIDI, and CAIDI is 3, then Q = +0.25%
- SAIFI, SAIDI, and CAIDI is 0, then Q = 0.00%
- SAIFI, SAIDI, and CAIDI is -3, then Q = -0.25%
- SAIFI, SAIDI, and CAIDI is -6 then Q = -0.40%
- SAIFI, SAIDI, and CAIDI is -9 then Q = -0.50%

4.2 The Benchmark SAIDI, SAIFI and CAIDI (Cont'd)

Since the performance in each of the three performance measures can either be above target, below target or on target (dead band) there are twenty-five (25) possible outcomes as shown in Table 4.2 below:

Table 4.2 Possible Q-factor scores

SAIDI	SAIFI	CAIDI	TOTAL	ADJUSTMENT FACTOR
3	3	3	9	0.50%
3	3	0	6	0.40%
3	0	3	6	0.40%
0	3	3	6	0.40%
3	0	0	3	0.25%
0	0	3	3	0.25%
0	3	0	3	0.25%
3	3	-3	3	0.25%
-3	3	3	3	0.25%
3	-3	3	3	0.25%
0	0	0	0	0.00%
3	0	-3	0	0.00%
-3	3	0	0	0.00%
0	-3	3	0	0.00%
-3	0	3	0	0.00%
0	0	-3	-3	-0.25%
0	-3	0	-3	-0.25%
-3	0	0	-3	-0.25%
3	-3	-3	-3	-0.25%
-3	-3	3	-3	-0.25%
-3	3	-3	-3	-0.25%
-3	0	-3	-6	-0.40%
0	-3	-3	-6	-0.40%
-3	-3	0	-6	-0.40%
-3	-3	-3	-9	-0.50%

This design of the Q-factor adjustment as a component of the PBRM is symmetrical and all possible outcomes are properly defined based on the PBRM point system. The design is balanced as it provides equal opportunity for either a positive or negative adjustment to the PBRM.

4.3 Past 5 Years Performance on SAIDI, SAIFI and CAIDI

Table 4.3 below outlines JPS performance for the past 5 years in the three main quality of service measures: SAIDI, SAIFI and CAIDI. The data shown here is for the complete system performance and includes interruptions due to generation, transmission and distribution outages. Additionally, the distribution interruptions include both feeder level and sub-feeder level outages. All the computations are based on the respective years' customer base.

4.3 Past 5 years performance on SAIDI, SAIFI and CAIDI (Cont'd)

Table 4.3.1: JPS 2007-2011 performance on SAIDI

	SAIDI					
					2011 Customer Count	
	2007	2008	2009	2010	*Fuse size	Actual
T&D	2538	2308	1925	1945	1390	1315
Generation	402	198	343	631	316	316
System Total	2940	2506	2268	2577	1706	1631
Annual % Reduction		15%	9%	-14%	34%	
Average Annual % Reduction	**11%**					

Table 4.3.2: JPS 2007-2011 performance on SAIFI

	SAIFI					
					2011 Customer Count	
	2007	2008	2009	2010	*Fuse size	Actual
T&D	16.25	16.85	14.41	14.00	11.24	10.67
Generation	7.37	7.49	11.81	15.10	10.76	10.76
System Total	23.62	24.34	26.22	29.10	22.00	21.43
Annual % Reduction		-3%	-8%	-11%	24%	
Average Annual % Reduction	***1%***					

Table 4.3.3: JPS 2007-2011 performance on CAIDI

	CAIDI					
					2011 Customer Count	
	2007	2008	2009	2010	*Fuse size	Actual
T&D	156	137	134	139	124	128
Generation	55	26	29	42	29	29
System Total	124	103	86	89	78	78
Annual % Reduction		17%	17%	-3%	13%	
Average Annual % Reduction	***11%***					

* Fuse size represents the previous method of computing customer count utilizing an estimation routine.

JPS average performance per year over the past 5 years averaged a reduction of 11%, 1% and 11% for SAIDI, SAIFI and CAIDI respectively.

4.4 Data collection methods

The calculation of SAIDI, SAIFI and CAIDI indices requires a discrete data set of information to be collected, namely:

- Outage start and end times;
- System total number of customers; and
- Number of customers affected by each outage.

4.4.1 Outages Start and End Times

Feeder level outage

At the feeder level all planned and forced outages are collected and stored in a Microsoft Access-based outage-logging database (developed in-house) located at System Control Centre. This information contains all the start and end times associated with the individual outages. These outage times are derived in the first instance from the SCADA system. In the event of communication failure the outage start times are derived from the customer call log, using the call time of the first affected customer as a proxy.

Sub feeder level outages

- Planned outages—planned outages at the sub-feeder level, are taken from the Outage Log Database at the System Control Centre. The outage times are derived from the actual switching times logged by the System Control Engineer or Dispatch Technician.

- Forced outages—the central call centre logs are used to provide outage start times. The start time is derived from the time the first affected customer called. The outage end time is determined by the recloser or switch closing time as reported to the system control engineer or dispatch technician by the field personnel and also recorded in the call centre log.

4.4.2 Number of Customers Interrupted

Feeder Level Outages

The actual customer count for the previous year for each feeder is utilized in the computation of the reliability indices. The determination of the customer location with respect to each feeder is determined by each customer's GPS location and/or the civic address relative to National Land Valuation (NLA) parcel information.

Sub-feeder level outages

A detailed assessment and verification exercise of actual customer count per lateral at the sub-feeder level was completed on March 31, 2011. JPS has commenced since April 2011 the utilization of actual customer count for reliability calculations in parallel with the method of using fuse size to estimate the number of customers affected.

4.5 Improvements in Data Maintenance

Base on JPS' investments in asset management technology over the past five years we now have a GIS system that captures and maintains record of pole numbers for all switch locations with number of customers supplied. In 2011 JPS developed and implemented a policy document (Pole Number Reference System) to ensure that all new asset additions, replacements, and modification on the T&D network are accurately referenced to the pole number system for efficient and reliable utilization in the outage management application.

4.5.1 Current data collection improvements

Consistent with the unique number (identifiers) for each of the 110 feeders island-wide JPS now have unique numbers (identifiers) for each of the over 40,000 switch locations island-wide. This unique identifier is a 6 digit number affixed to each pole. Since January 2010 all new concrete poles manufactured have this unique number affixed.

The present operational procedure is to log all outage event to the pole number of the fuse that operated, which now result in each outage being assigned to a unique switch identifier, and in turn an accurate customer count.

In 2011 JPS commenced collecting data on MAIFI for each feeder on a monthly basis, which will be used to identify and prioritize solutions to effectively improve performance for this index.

Feeder Level Outages

These outages will continue to be captured at the System Control Centre outage-logging database time stamped using the data provided by the SCADA system.

Sub-feeder level outage

- Planned outages — for planned outages at the sub-feeder level, all outages are currently tied to a switching point and unique pole number, which in turn is mapped to the customer count database. The start and end times are recorded and captured in the Outage Log Database at the System Control Centre.

- Forced outages — for forced outages JPS will continue using the start time of outages to be that of the time of the call of the first affected customer and the end time as that determined by the recloser or switch closing time.

4.5 Improvements in Data Maintenance (Cont'd)

4.5.2 JPS Proposal

JPS will continue to utilise the improved data capture mechanism previously outlined mapped to the actual customer count to compute system reliability indices for 2012. A comparison of the 2011 reliability indices based on actual customer count and estimation of customer count by fuse size revealed a 1.5% difference.

A benchmark performance was established and the average percentage change over the past 5 years was applied to set reliability targets starting 2012.

As submitted in previous years a total system customer count is provided along with the individual feeder counts.

4.6 JPS System Reliability Improvement Programme

JPS has increased the level of focus and priority aimed at improving the reliability of service to its customers. In addition significant investments have been made in the improvement of the measurement systems and in the rehabilitation and reinforcements of the T&D network. Over the past 2 years more than US$21M has been invested in a number of projects aimed at improving the quality of service to customers.

JPS 2012 System Reliability Objectives:

- **Reduction in SAIDI**
  a. Faster dispatch and response time to outages
  b. Utilisation of Trouble Call Management System to prioritize section outages that impact the largest number of customers and therefore ultimately, SAIDI.

- **Reduction in SAIFI & by extension SAIDI**
  a. Reduction in the number of outages by targeting the worst performing feeders.
  b. Implement targeted preventative maintenance program for all parishes.

- **Application of Technology**
  a. Ultrasonic Leakage Current Detector (Inspector101)
  b. Infra-red Scanner
  c. Pole-mounted Reclosers
  d. Insulated MV conductor covers
  e. Insulated MV covered conductors
  f. Fuse Coordination software
  g. Application of Faulted Circuit Indicators

4.6 JPS System Reliability Improvement Program (Cont'd)

The table below details the capital investment projects for 2010, 2011 and 2012 aimed at improving reliability performance.

T&D System	Project Cost (US$M)		
Description	**2010**	**2011**	**2012**
Structural Integrity (Replacement of poles)	4.50	5.00	5.80
Substation Line in Line	1.50	1.50	0.66
Pole Mounted Reclosers	0.20	0.25	0.25
Targeted Feeders Distribution Reliability Improvement	1.00	2.00	1.54
Pole-mounted Transformer Replacement	2.83	1.80	2.50
Tools and other regional activities (line relocation for safety and access)	-	0.500	0.28
Total	**10.04**	**11.05**	**11.02**

4.7 Adjustments to Reliability Indices

The average duration of a sustained interruption (CAIDI) experienced by a customer, has been monitored and reported by JPS to the OUR since 2004 when the reliability indices were first introduced in the PBRM. It has long been viewed that the monitoring of SAIDI and SAIFI and in particular CAIDI presented some ambiguity due to the mathematical relationship between the indices and as such the expertise of an outside consultant was sought.

The report presented by the consultant confirms the position consistently advanced by JPS to discontinue the use of CAIDI as a benchmark, while upholding the use of SAIDI and SAIFI as the triggers to a quality of service adjustment.

In the report [3]***X Factor and Q factor Recommendations for JPS, October 2008*** prepared by **Pacific Economic Group** for the 2009-14 Tariff Review, the reasons for CAIDI exclusion are outlined as:

- " The metric is redundant when SAIDI and SAIFI are already included in the metrics"
- " It can be demonstrated mathematically that SAIDI and SAIFI are ultimately what matters to customers"
- "Using SAIDI, SAIFI and CAIDI to measure quality can lead to anomalous and unwarranted penalties or rewards in a service quality mechanism"

An incident of the anomalous penalties was observed in the submission of the 2008 annual tariff submission, where SAIDI and SAIFI were both better than target by 10% and 33% respectively, however performance, as measured by CAIDI worsened by 37%.

[3] A copy of the report can be viewed in Annex I to the JPS 2009 Tariff Review Application.

4.7 Adjustments to Reliability Indices (Cont'd)

The poor performance in CAIDI was as a result of the mathematical relationship between CAIDI and the other two indices. Because there was a greater reduction in SAIFI than the reduction in SAIDI this caused the measured value of CAIDI to be greater, resulting in a worsened CAIDI. This CAIDI value does not accurately represent a reduction in the quality of service to customers, as both the frequency and the duration of outages were reduced. However JPS was penalized by –3 quality points for the 'worse than target' CAIDI value.

It is important to note, therefore, that Table 3.1 had an inherent mathematical error in it as it relates to the derivation of the CAIDI target for 2006 – 2009. Since CAIDI represents SAIDI divided by SAIFI, if SAIDI and SAIFI were expected to improve by the same percentage each year, then the CAIDI target should have been held constant[4].

4.7.1 Proposed adjustment to Reliability Indices.

JPS again proposes that CAIDI be removed from the PBRM for the reasons already well-documented. Notwithstanding this proposed omission, JPS is committed to the continuous improvement in the service quality delivered to customers and as such will continue to make the requisite investments necessary to continually improve the quality of service for our customers as reflected in the SAIDI and SAIFI indices.

MAIFI

JPS commenced the monitoring of MAIFI in 2011. The measured value of MAIFI for 2011 is 109.

The Company will continue to monitor MAIFI but reiterates the position that it is inappropriate to include this measure in the "Q" Factor adjustment. MAIFI is very seldom used as a service quality indicator with attendant incentive/penalty even in mature electricity markets. The difficulty of determining the appropriate level of MAIFI, the value customers place on these type of interruption versus the investment required to reduce it has engendered far less consensus on the value of this measure for the purposes of driving reliability performance. JPS is proposing that the next 2 years be used as test years to gather sufficient performance information from which a performance target for MAIFI can be derived at the 2014 tariff review and this index be included in the Company's Overall Standards for ongoing monitoring and reporting.

[4] That is to say if SAIDI is assumed to be 2,500 and SAIFI is 100, then CAIDI must be 25 (2,500/100). If we assume a 10% improvement in SAIDI and SAIFI, to 2,250 and 90 respectively, it stands to reason that CAIDI must remain constant at 25 (2,250/90). Therefore, to assume that CAIDI will also improve by 10% is mathematically incorrect. This explains why the inclusion of CAIDI is redundant and why the assumption that CAIDI will also improve each year is incorrect.

4.7 Adjustments to Reliability Indices (Cont'd)

2012 Performance Target

JPS therefore proposes that the performance targets for 2012 shall be based on the 2010 benchmark adjusted for 3% improvement for both of the indices (SAIDI and SAIFI). The actual performance targets for 2012 are shown in table 4.6 below:

Table 4.6: Setting the 2012 Q-factor performance benchmark

	2010 Actual	Adjustment factor		2012 Target
SAIDI	2,577	* (1 – 0.05)	=	2,448
SAIFI	29.11	* (1 – 0.05)	=	27.65
~~CAIDI~~	~~89.00~~	~~* (1 – 0.05)~~	~~=~~	~~84.55~~