National University of Sciences & Technology (NUST)

NUST Business School

FINAL THESIS REPORT:

Improving Profitability at Ufone by Optimizing Operating Expenditure

By

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1 Abstract

In order to sustain the rigorous competition amongst telecom operators, Ufone is trying to modernize its network and cut down its expenditure. An area of crucial importance in this regard is their operating expenditure to sales ratio. This is a key metric for telecom operators and here Ufone is hemorrhaging money on account of costs associated in running its networks on diesel generators and batteries in the absence of commercial electricity. This is a cash pit for them, and demands immediate attention, if they're going to have a shot at making this a profitable business as these costs are the major contributor in the overall operation expenditure of a mobile operator. This study attempts to tackle this money pit of operational expenditure by analyzing the revenue loss due to fueling and alternate power arrangements, identifying its loop holes, researching industry 'best practices', along with analyzing the organizational challenges of running non Telco operations at a telecom operator.

Introduction

2 Executive Summary

Telecom is a cash intensive business & due to excessive competition its core product is commoditized. Telecom networks have a ravenous appetite for energy & hence a major casualty of the severe power outages in Pakistan. To keep networks on air, operators have invested millions of dollars in deploying 'make-shift' arrangements like diesel powered generator sets. This cost for Ufone runs up to 30 Million and eating up into their EBITDA.

As Ufone desperately looks for a turnaround strategy, this study attempted to tackle this money pit of operational expenditure by analyzing the revenue loss due to fueling and alternate power arrangements, identifying its loop holes, researching industry 'best practices', along with analyzing the organizational challenges of running non Telco operations at a telecom operator.

During the subject research, concerned personnel who look after operation and maintenance of generators and batteries, refueling operations and cost control at Ufone; helped in formulation of this study. They've a mandate to introduce process and system improvements in this part of Non-Telco operations to achieve operational excellence.

This study proposes the following interventions to address this problem:

- Diesel powered generator sets, though available in abundance, are the least desirable option for power backup and should be replaced with deep-cycle batteries.
- The 'human element' in monitoring of fuel is the weakest link and should be replaced by 'telemetering' devices installed inside the fuel tanks.

- The significance of this problem merits an organizational restructuring where the more ownership across departments is provided and makes commercial division a stake holder with technical division, to achieve the organizational objective of optimizing OPEX (Operating expenses) particularly related to non-Telco.

3 Background &Business problem

Ufone is currently ranked last amongst the total of 04 telecom operators in Pakistan after merger of Warid Telecom with Mobilink and risks being relegated to a same fate as Instaphone, which had to close down operations due to running an outdated network and hence become obsolete. Presently, they're attempting to make good on their existing **6.2 Billion US** investments, and desperately attempting to increase their market share. For this matter, they have committed to further investments, of **250 Million USD**.

In this regard a lot of efforts have been expended in network modernization and marketing of the new products offered by Ufone. However, an area of crucial importance still remains ambiguous, their operating expenditure to sales ratio. This is a key metric for telecom operators and here Ufone is hemorrhaging money on account of costs associated in running its networks on diesel generators and batteries in the absence of commercial electricity. This is a cash pit for them, and demands immediate attention, if they're going to have a shot at making this a profitable business as these costs are the major contributor in the overall operation expenditure of a mobile operator.

4 Study

4.1 STEP 1: Data Gathering

The detailed data was gathered on site wise network outages for complete June 2015to begin the analysis. On a high level the data contains the outage related to telecommunication equipment failure, force majeure and failure/issues caused due to non-telecommunication equipment. The data contained the time, duration and possible causes of the outage along with the priority of the site.

4.2 STEP 2: Data Analysis

The triggers for these outages were then examined, which led to a disturbing revelation that 'non-Telco' events alone contribute to almost **20.5%** of network outages (No. of hits) and **56.6%** of total network downtime in terms of hours of outages.

Data for month wise trend of Telco and Non-Telco outages for 2015 is available in the Annex-1.

The following chart highlights total outages in terms of number of hits (**106,494)** in June, 2015.

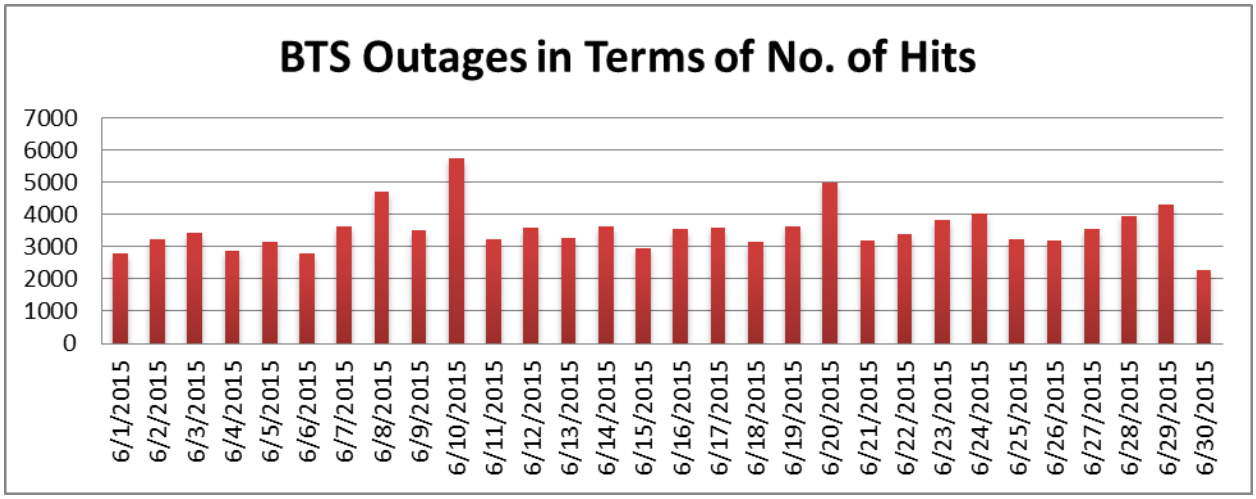


Figure 1 BTS Outages 2015 (Hits)

Similarly in terms of time, the distribution of outages in hours **(32,375 hours in June 2015)** is as under:

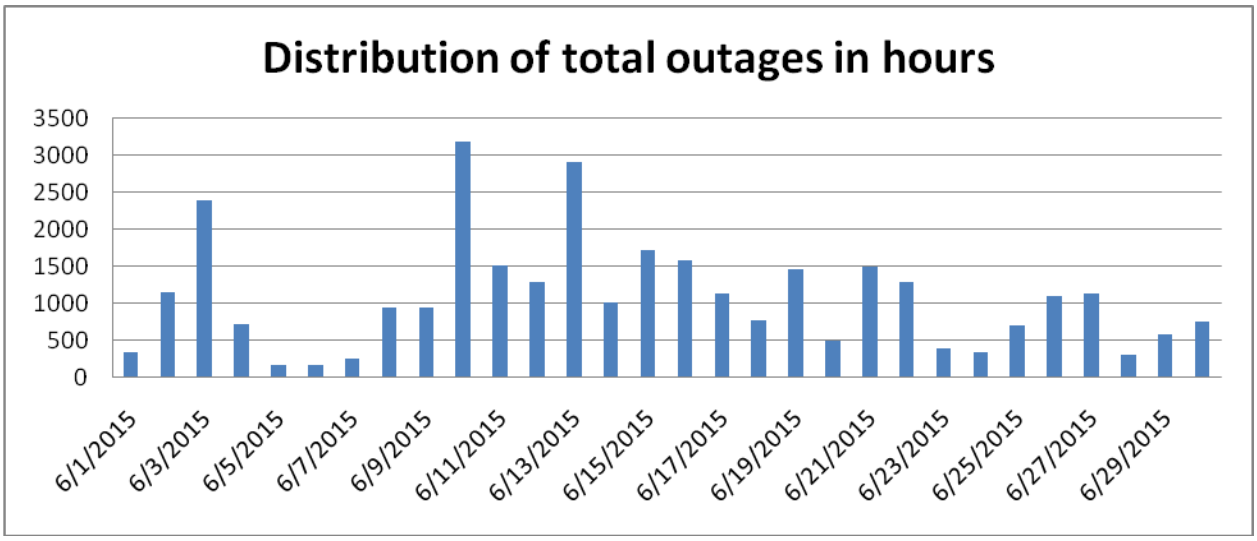


Figure 2 Distribution of total outages in hours

4.3 STEP 3: NOSS outage classification

Drilling further into the NOSS outages, on-Telco failures have been classified as the cause of 21,925 of the outages.

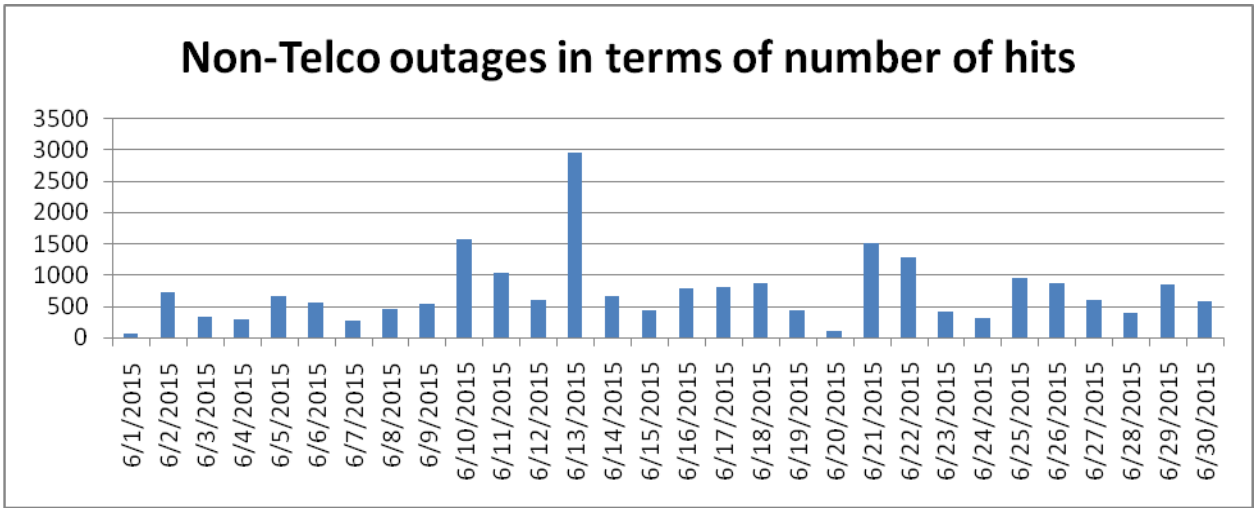


Figure 3 Non-Telco outages in terms of number of hits

Similarly in terms of time, the distribution of outages in hours **(18,902 hours in June 2015)** is as under:

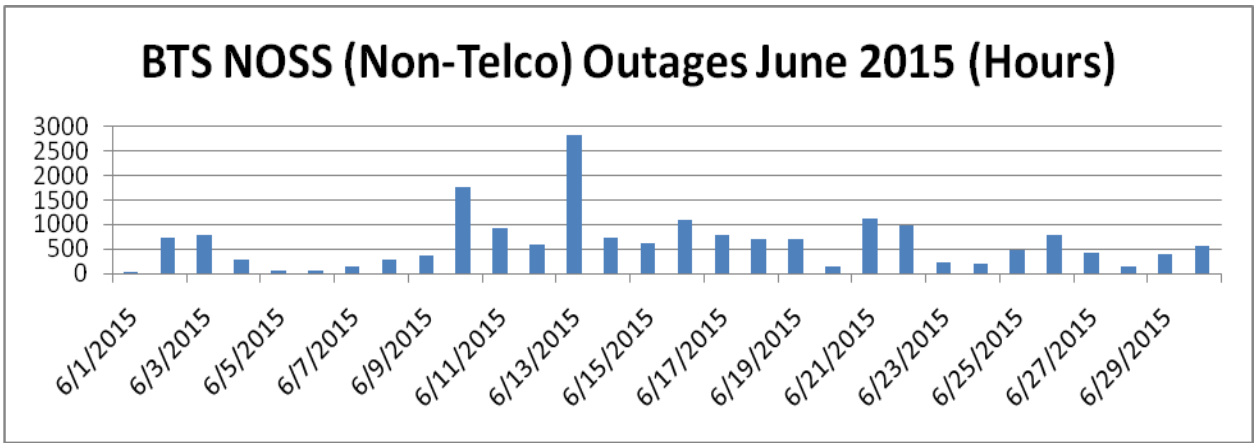


Figure 4 BTS NOSS (Non-Telco) Outages June 2015 (Hours)

The pie chart below clearly highlights the contribution of Non-Telco outages to Ufone Network in terms of number of hits in June, 2015. Issue wise breakdown of non-Telco outages is given in Annex-2.

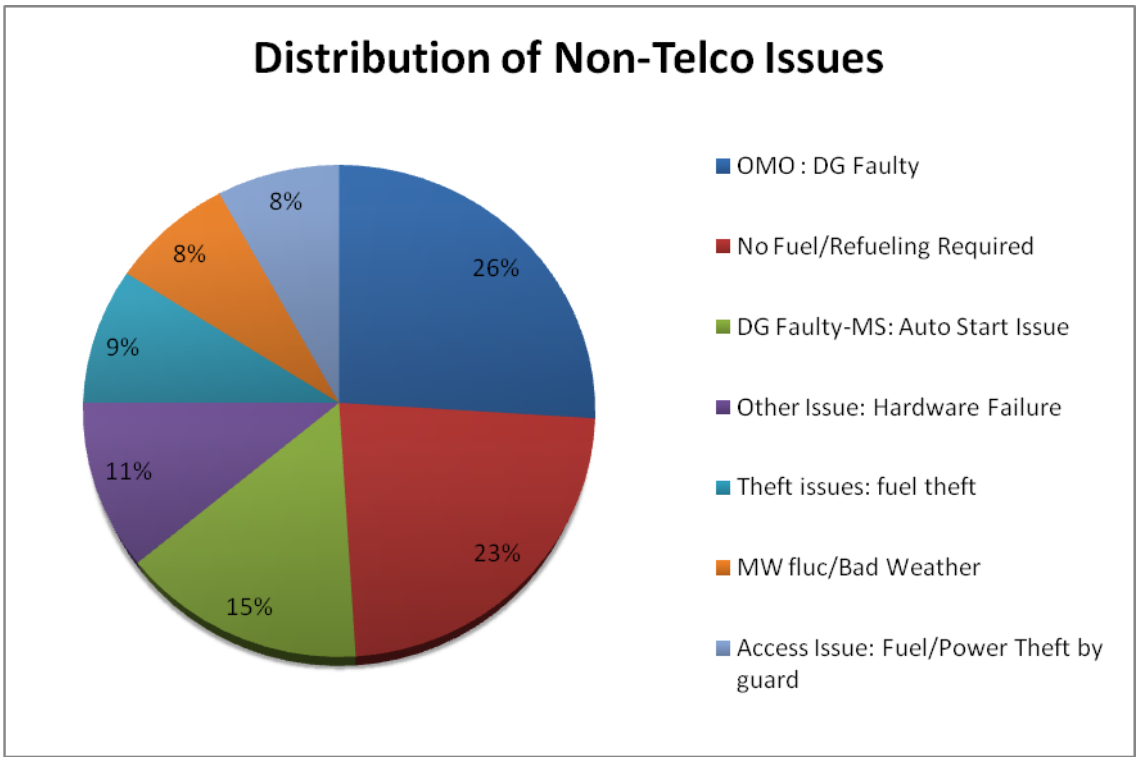


Figure 5 Distribution of various non-Telco issues

In June 2015 alone there were about 12,561outages related to malfunctioning of backup generators and related backup batteries. The factors contributing to these outages are explained later in the document.

4.4 Step 4: Trend Analysis

The interesting observation here was the variable trend of the "DG Equipment failure" issue which shows variance in various months. The trend can be attributed to the commercial power shortage and weather conditions. Numerical Data for trend analysis is given in Annex-3. Below is the monthly trend of the various issues in the non-Telco outages:-

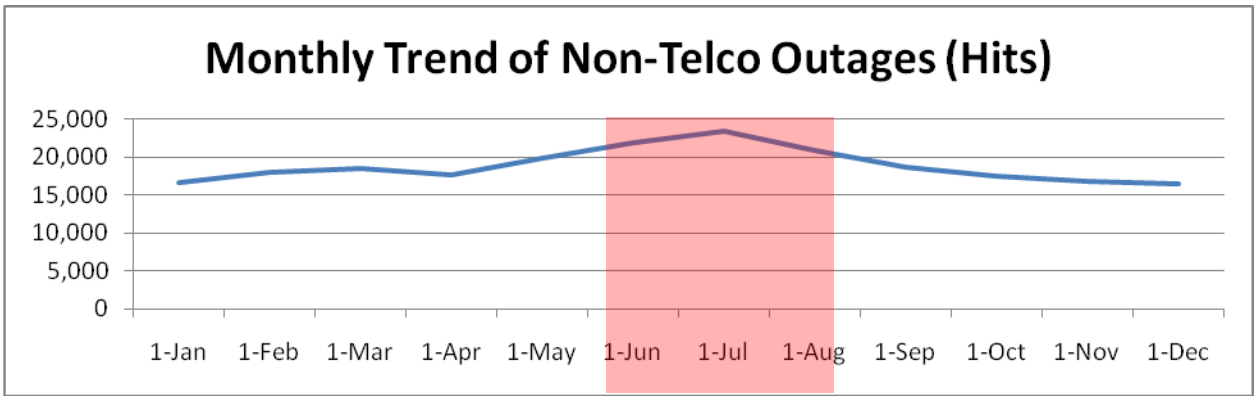


Figure 6 Non-Telco outages monthly trend

The following graph shows the behavior of monthly distribution of outages, in terms of hits and hours:

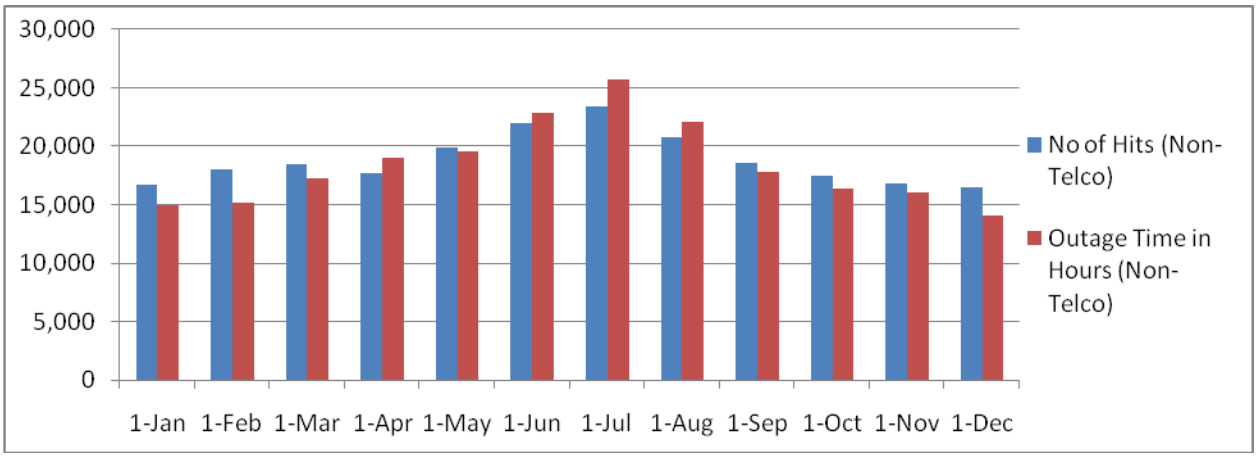


Figure 7 Monthly distribution of non-Telco outages in terms of hits and hours

4.5 Step 5: Revenue Impact

Monthly distribution of revenue loss due to Non-Telco outages is as under:-

Table 1 Monthly distribution of revenue loss due to Non-Telco outages

Month	No of Hits (Non-Telco)	Outage Time in Hours (Non-Telco)	Revenue Loss (Non-Telco)
January	16,690	14,972	4,037,857
February	18,066	15,210	4,330,051
March	18,442	17,263	4,442,595
April	17,662	19,019	4,736,465
May	19,862	19,603	4,688,036
June	21,925	22,807	5,187,357
July	23,389	25,767	5,803,354
August	20,802	22,113	5,627,893
September	18,625	17,845	4,976,039
October	17,465	16,386	4,030,195
November	16,864	16,043	3,850,544
December	16,465	14,084	3,730,877

More than 80 percent contribution to revenue loss is due to the “DG equipment fault”, “Fuel Finished” and “Owner/Guard issue”. Comparison of revenue loss for Telco and non-Telco issues is given in Annex-4.

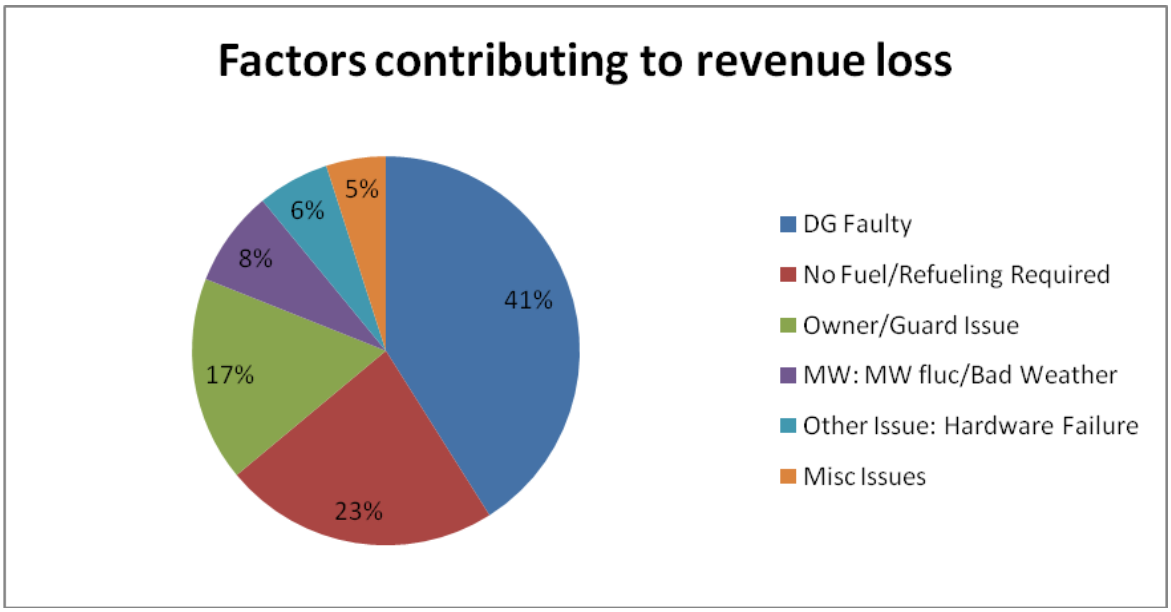


Figure 8 Factors contributing to revenue loss

4.6 Step 6: Primary Research and Site Surveys:

The primary research is based on the onsite surveys, interviews from relevant teams in Ufone and Industry experts. Based on the analysis of distribution of outages is Figure 8, the major contributor in the 2015 non-Telco related outages were faulty DG, Fuel issues and owner/guard issues. To further investigate in to the factors contributing to these issues site surveys on 30 sites in the north and central regions were conducted to see on ground realties. Questionnaire based surveys were conducted from the security guards and their supervisors (Annex-5).

To further elaborate on the cause and effect, focus group sessions were conducted at various levels in Ufone. These discussion included Ufone head office teams of power &optimizations, site sharing operations and DGs O&M and regional managers of refueling & repair/maintenance staff.

To determine the cause and effect, a fishbone diagram (shown in Annex -6) was constructed based on these surveys, interviews and focus groups.

4.7 Step 7: Data Analysis & Interpretation (Survey Results)

Statistical Package for the Social Sciences (SPSS) version 16 is used in the study for the purpose of analysis and presentation of results. Descriptive statistics based on frequency tables are used for providing information on relevant variables. The descriptive statistics used in the study are based on frequency distribution tables and graphical presentation for the responses from the respondents.

Six steps are used to data preparation. In first step, variables are defined. In second step, data is entered. In third step, missing value in the data is checked. There is no missing value in table. In fourth step, reversal question in the data is checked. There is no reversal question in data. In fifth step, reliability of items of different dimension is checked to confirm that these have the consistency. In sixth step, variables are computed for further analysis.

4.7.1 Descriptive Statistics

Relevant statistical data regarding site priority, type of fault and duration of outage is given below:-

Table 2 Descriptive statistics

Site Priority	**Description**	**P1**	**P2**	**P3**
	Frequency	6127	7355	8443
	Percentage	28%	34%	39%
Type of Fault	**Reason of Non-Telco outage**	**Frequency**	**Percent**	
	Faulty DG	8976	41%	
	No Fuel	5109	23%	
	Unguarded Site	3812	17%	
	Owner/ Infrastructure issue	4185	19%	
Duration of the outage	**Outage in Hours**	**Frequency**	**Percent**	
	Less than 1 hour	11756	54%	
	1 to 10	6967	32%	
	10 to 24	2847	13%	
	More than 24 hours	355	2%	

4.7.2 Reliability

Dependence of fuel shortage on major factors is analyzed below:-

Table 3 Reliability and Cronbach's alpha

Description	Cronbach's Alpha	No of Items
Outage because of Fuel Theft	0.871	8976
Outage because of DG Issues	0.835	5109
Unguarded Site Issues	0.71	3812
Infrastructure Issue	0.73	4185

Outage because of Fuel Theft: Reliability of Cost / Time Effective is .871which shows that there is consistency in items of scale.

Outage because of DG Issues: Reliability of Strategic Strength is .835which shows that there is consistency in items of scale.

Unguarded Site Issues: Reliability of Competitiveness is .710which shows that there is consistency in items of scale.

Infrastructure Issue: Reliability is .730which shows that there is consistency in items of scale.

4.7.3 Correlation

Correlation of different factors is analyzed in following table:-

Table 4 Correlation of different factors related to outages

Outage		Fuel Theft Outage	DG Issue	Unguarded Site Issue	Infrastructure Issue
Fuel Theft Issue	**Pearson Correlation**	**1**	**.848****	**.771****	**.624****
	Sig. (2-tailed)		**0**	**0**	**0**
	N	**240**	**240**	**240**	**240**
DG Issue	**Pearson Correlation**	**.848****	**1**	**.808****	**.690****
	Sig. (2-tailed)	**0**		**0**	**0**
	N	**240**	**240**	**240**	**240**
Unguarded Site Issue	**Pearson Correlation**	**.771****	**.808****	**1**	**.925****
	Sig. (2-tailed)	**0**	**0**		**0**
	N	**240**	**240**	**240**	**240**
Infrastructure Issue	**Pearson Correlation**	**.624****	**.690****	**.925****	**1**
	Sig. (2-tailed)	**0**	**0**	**0**	
	N	**240**	**240**	**240**	**240**

**. Correlation is significant at the 0.01 level (2-tailed)

Fuel Theft Issue Relation with Outage: Pearson correlation is .624 which indicates that there is strong positive/decisive relationship between the variables and significance level is 0.000.

DG Issue Relation with Outage: Pearson correlation is .690 which presents that there is strong positive/decisive relationship between the variables and significance level is .000.

Unguarded Site Relation with Outage: Pearson correlation is .925 which indicates that there is strong positive/decisive relationship between these variables and significance level is .000.

4.7.4 Regression

Fuel Theft with Outage: The standardized coefficient (beta) is .624 at significance level of .000 which indicates that if 1 unit of **Fuel Theft** is increased than **Outage** will increase 0.624 units

Table 5 Regression analysis

Model Summary						
Model	**R**	**R Square**	**Adjusted R Square**	**Std. Error of the Estimate**		
1	**0.624**	**0.39**	**0.387**	**0.5781**		
Coefficients						
Model		**Un-standardized Coefficients**		**Standardized Coefficients**	**Time**	**Sig.**
		B	**Std. Error**	**Beta**		
1	**(Constant)**	**1.349**	**0.169**		**7.983**	**0**
	Fuel Theft	**0.616**	**0.05**	**0.624**	**12.332**	**0**

Unguarded Sites with Outage: The standardized coefficient beta is .690 at significance level of .000 which shows that if 1 unit of unguarded site increased than Outage shall increase 0.690 units.

Table 6 Model summary

Model Summary				
Model	**R**	**R Square**	**Adjusted R Square**	**Std. Error of the Estimate**
1	**0.690**	**0.476**	**0.474**	**0.53558**

Coefficients						
Model		**Un-standardized Coefficients**		**Standardized Coefficients**	**t**	**Sig.**
		B	**Std. Error**	**Beta**		
1	**(Constant)**	**0.76**	**0.182**		**4.187**	**0**
	Unguarded Site	**0.75**	**0.051**	**0.69**	**14.713**	**0**

DG Issue with Outage : The standardized coefficient beta is .925 at significance level of .000 which shows that if 1 unit DG issue increased than Outage shall increase 0.925 units.

Model Summary				
Model	**R**	**R Square**	**Adjusted R Square**	**Std. Error of the Estimate**
1	**.925**	**0.855**	**0.854**	**0.2821**

Model		Un-standardized Coefficients		Standardized Coefficients	t	Sig.
		B	**Std. Error**	**Beta**		
1	**(Constant)**	**-0.449**	**0.104**		**-4.319**	**0**
	Unguarded Site	**1.124**	**0.03**	**0.925**	**37.419**	**0**

4.7.5 Hypothesis Testing

Keeping in view the aforementioned statistical analysis the following can be safely concluded:-

H1: Fuel Theft directly impacts on Outage. ***(Accepted)***

H2: DG Issue directly impacts on Outage. ***(Accepted)***

H3: Unguarded sites also result in Outage. ***(Accepted)***

4.8 Step 8: NOSS Organizational Analysis

NOSS department falls under the technology division at Ufone and reports to the Director of Operations, who is usually a career engineer with strong technical know-how.

Furthermore, this is an 'in-house' activity at Ufone i.e. staffed by people on Ufone's payroll. This organization is staffed with approx. 60 permanent employees and more than 100 contractual employees deployed in the regions.

Key points pertaining to this organization are as follows:

- NOSS organizations is head office contains permanent employees in the central role of fuel scheduling, power optimization, security, site acquisition, infrastructure management, reporting, invoicing and billing & reconciliation
- There are two Networks wide control centers (NOCs) for fueling and DG O&M working in Head office at Lahore.
- The onsite operations are managed by a Regional Manager is each of the four regions.
- Regional Manager SIA reporting to Regional Manager is responsible for the Security and the Site Infrastructure including civil works (salary 60,000)
- Regional Manager Power and Optimization(Salary Rs. 60,000 – 80,000) reporting to Regional Manager is responsible for the re-fueling operations in the region as per the fueling schedule issued by the Head Office central fueling team (Power & optimization control Manager).
- There are 3 Area Managers in Central II region who are responsible for the operation and maintenance of the Non-Telco equipment including Diesel Generators. The

number of Area Managers is different for different regions depending on the geographical area (Salary Rs. 101,000-120,000).

- Team Leads are supporting RM by using the Technical Support Officers (TSO) from the pool. At a given time 3-4 TSOs are assigned to a TL. (Salary Rs. 70,000-90,000)

- TSO's are in a regional pool and used by Team Leads on need basis. There are ~39 TSO's in the central II region (Salary Rs. 40,000- 60,000).

- Total Strength of NOSS team in C-II region is ~50 resources out which 12 are permanent employees of Ufone where are 39 are contractual employees.

- The contractual employees don't have the gratuity and provident fund. Their medical entitlement doesn't cover parents. Usually the special discounts/promotions offered by Head Office are also limited to permanent staff only.

5 Findings

The inherit weaknesses of using diesel powered generator sets are as follows:

- High running cost
- Prone to accidents
- Threat of theft
- Requirement of daily maintenance
- Fuel/refueling issues
- No central management
- Variable cost of fuel
- Too much human dependency (Fueling process is given in Annex-7)
- Additional vendor management

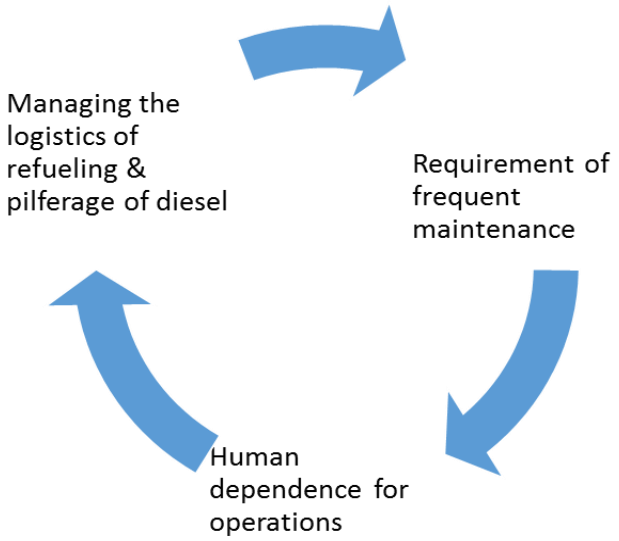


Figure 9 DG Maintenance Cycle

Some of the facts related to DG generators and their impact on outages and revenue are as under:-

- Total outages in terms of number of hits in June, 2015 are **106,494**
- Total outages in terms of number of hours in June, 2015 are**32,375**
- Non Telco outages in terms of number of hits in June, 2015 are**21,925**
- Non Telco outages in terms of number of hours in June, 2015 are**18,902**
- In June 2015 alone, there were about **12,561**outages related to malfunctioning of backup generators and related backup batteries
- More than 80 percent contribution to revenue loss is due to the "DG equipment fault", "Fuel Finished" and "Owner/Guard issue"
- The triggers for these outages were then examined, which led to a disturbing revelation that 'non-Telco' events alone contribute to almost **20.5%** of network outages (No. of hits) and **56.6%** of total network downtime in terms of hours of outages

Top ten factors contributing to the outages in terms of number of hits are as follows:

- OMO: OMO DG Faulty
- DG Faulty-MS: Auto Start Issue
- MW: MW fluc/Bad Weather
- OMO: OMO DG Starting issue
- OMO: DG starting issue

- DG Faulty-MS: Part Faulty/ Replacement
- DG Fuel: No Fuel/Refueling Required
- DS: OMO Power/DG Fault Issue
- Other Issue: Hardware Failure

5.1 ARPU Analysis

The yearly ARPU of Ufone is the largest as per the PTA survey in 2013 as shown in the table below. These ARPU figures are based on the pre 3G/LTE era, so it can be safely assumed that the ARPU will increase going forward. The APRU figures suggest that Ufone can increase its profit margins as the associated cost of operations can be reduced. This justifies the CAPEX required for the introduction of deep cycle batteries as it will not only help reduce the dependency on the expansive fuel but will also improve the losses incurred due to pilferage/theft.

Table 7 Annual revenue per user (ARPU): Comparison

	Revenue-2013 USD million	Revenue Market share %	ARPU PKR
Mobilink	**960**	**29.1%**	**225**
Telenor	**896**	**27.4%**	**242**
Zong	**608**	**19.3%**	**217**
Ufone	**384**	**15.5%**	**263**
Warid	**352**	**8.6%**	**142**

6 Recommendations

Based on the analysis and findings in the preceding sections, the problems can be grouped under following categories:

- Replacement and/or improvement in the existing technologies/equipment being used as alternate power source to minimize the dependency on the systems which are heavy on the fuel consumption. As Fuel theft is the major cause of outage.

- Optimization in the process and human related policies to minimize the human interaction in the overall re-fueling process and restructuring the organization and incentives of human resource to make them a stake holder in the losses due to pilferage.

6.1 Technological & Equipment Improvement:

Following options have been evaluated to address this:

6.1.1 Solar Powered Backup:

Lot of setups in Pakistan with continues power requirements are using solar panels, therefore a business case has been calculated for use of solar panels instead of diesel generators. This option may provide the proper off grid solution for Ufone. The business case has been calculated keeping in view the consumption pattern of various DG equipment type used in the Ufone network based on average eight hours of outage per day. The other conditions like fuel price, load shedding hours and useful battery life have been included in the analysis to see the viability of proposed solution. As shown in table 8, the break even can be achieved within 57 months.

Table 8 Break even analysis for solar panels

Description	Diesel Generators Cost per Month	DG cost For 5 Years	Solar Panels Monthly Cost	Solar Panels Cost for 5 Years
Installation	-	-	**600,000**	**600,000**
Fuel	**10,000**	**600,000**	-	-
Maintenance	**4,000**	**240,000**	-	-
Operator	**10,000**	**600,000**	**10,000**	**600,000**
Housing	**3,000**	**180,000**	**6,000**	**360,000**
Total Cost		**1,620,000**		**1,560,000**
	Break Even in months		**57 Months**	

Though solar powered backup is being utilized for an increasing number of situations, as per financial analysis given in Table 8, it will almost cost same as diesel generators in 5 years time period. Moreover, it will have inherited problems of housing and operator issues like diesel generators. These issues are appended below:-

- Significant CAPEX requirements – up to PKR 10M / site, make this a costly proposal

Operational challenges like:

- Need to frequently clean the panels for optimal power generation
- Real estate requirements to construct large solar platforms
- Vulnerability of panels to vandalism
- Seasonality and the weather conditions can severely impact the operations

All of the above lead to human dependency, which is a major cause of concern with diesel powered generators.

6.1.2 Deep Cycle Batteries:

Deep-cycle batteries are used in telecom networks, but conventionally provisioned only as a short time backup, mostly to fill the time till diesel generators kick in.

By introducing deep cycle batteries as alternatives to electricity Ufone will be able to tackle both the diesel generators maintenance issues and refueling costs, along with associated challenges. Furthermore, these batteries are maintenance free and hence don't require any direct operating expenditures.

Table 9 Break even analysis for deep cycle batteries

Description	Diesel Generators Cost per Month	DG cost For 5 Years	Deep Cycle Batteries Cost
Installation	-	-	**1,200,000**
Fuel	**10,000**	**600,000**	-
Maintenance	**4,000**	**240,000**	-
Operator	**10,000**	**600,000**	-
Housing	**3,000**	**180,000**	-
Total Cost	**27,000**	**1,620,000**	**1,200,000**
	Break Even		**44 Months**

The business case has been calculated keeping in view the consumption pattern of various DG equipment type used in the Ufone network based on average eight hours of outage per day. The other conditions like fuel price, load shedding hours and useful battery life have been included in the analysis to see the viability of proposed solution. As shown in table 9,

the break even can be achieved within 44 months. Hence it is recommended that immediate, yet phase-wise roll out of these to replace diesel powered generators.

In first phase, it is recommended to move 100 Priority 3 sites on the deep cycle batteries since they have similar fuel consumption as P1 and P2 sites and revenue contribution is much less.. In the second phase, a mixture of P2 & P1 sites can be moved on deep cycle batteries depending on their overall revenue contribution. The revenue contribution per site trend can be evaluated through Ufone's Business Intelligence system.

6.2 Comparison of Technical Recommendations in Terms of Cost

Following is the comparison between use of diesel generators, deep cycle batteries and solar panels in terms of cost that will be required in next 5 years:-

Table 10 6.2 Comparison of Technical Recommendations in Terms of Cost

Description	Diesel Generators Cost per Month	DG cost For 5 Years	Solar Panels Monthly Cost	Solar Panels Cost for 5 Years	Deep Cycle Batteries Cost	Deep Cycle Batteries Cost for 5 years
Installation	-	-	600,000	600,000	1,200,000	1,200,000
Fuel	10,000	600,000	-	-	-	-
Maintenance	4,000	240,000	-	-	-	-
Operator	10,000	600,000	10,000	600,000	-	-
Housing	3,000	180,000	6,000	360,000	-	-
Total Cost		1,620,000		1,560,000	1,200,000	1,200,000
	Break Even in months		57 Months		44 Months	

It is pertinent to highlight that besides having less break even time, by adopting deep cycle batteries, operation cost can be reduced considerably. Therefore, terms of cost, deep cycle batteries have the least cost.

6.3 Telemetering & Daily Reporting

There will still be P1 sites which will have diesel powered gensets, as additional backups in case of excessive load shedding, installing telemetering systems is recommended for monitoring of fuel.

Though Ufone has a well-articulated process for genset maintenance and refueling, but through their data and our field visits it's abundantly clear that there are several challenges in enforcing it. The reasons for this are mainly attributable to a dependence on the refueling supervisors, field engineers and security guards on duty.

By installing telemetering systems for *automated* and *accurate* reporting of fuel on site, a major contributor to cell site outages can be eliminated. This low-tech gadgetry, linked up to a reporting database in the headquarters will go a long way in eliminating the errors and omissions currently witnessed in the refueling process. As the site fuel information is sent to the central database via sms text, the nationwide fuel situation can be conveniently analyzed in macros embedded in excel and swiftly presented to relevant managers using dashboards.

6.4 Organizational Improvements

Referring to the issues identified in the fueling process & reasons for outages, the human element in the entire process cannot be ignored.

The causes for network issues, attributable to personal are on account of the issues shown in the figure below:

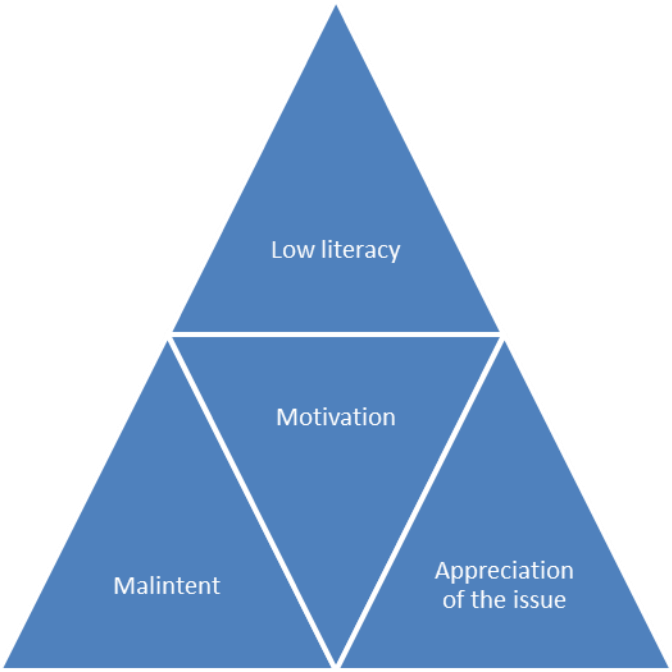


Figure 10 Causes of network issues attributable to personnel

The core issue with human errors is the lack of motivation to participate in optimizing expenses incurred in running the network. This may be attributable to the fact that NOSS though an 'in-house' functions is staffed majorly by contractual staff who have fixed income, with lower perks than the regular Ufone employees, and perceived to be doing a menial job.

Additionally, the executive in charge of this function is by job definition a highly skilled resource who is adapt at managing the complex technical aspects of running a network. However, the sort of issues faced in this process require a different set of skill sets, e.g. public affairs, small scale vendor management, supply chain of fuel etc. which may be difficult to master for the technical team.

Finally, running this operation in-house, while managing up to 10 different vendors, is also a costlier proposition compared to outsourcing to a mega vendor, as it was found to be the practice for all the other operators in Pakistan. These major outsourcing vendors provide these services at a superior cost due to scale of economies.

In addition to the cost optimization and freeing up of in house resources to focus on their core strengths in technology, through contractual provisions and associated commercial terms Ufone will have a better hand on these vendors – who will in turn be keeping a close eye on issues like network outages, pilferage etc. Another important advantage in this arrangement will be the fact that for mega vendors their stakes are significantly higher than merely leasing generators or providing refueling services which will lead them to perform these tasks diligently.

It is, therefore, recommended the outsourcing model for better leverage on fueling & genset maintenance vendors, as well as removing the organization anomaly of maintaining a sizeable organization with fundamentally different level of skill sets, remunerations and aspirations; all translating to needless friction in the teams.

In case of outsourcing of the Non-Telco operations, Ufone would only need to maintain the regional NOSS structure of check and balances. Here too, with the change in responsibilities Ufone may be able to optimize head counts.

Additionally, it is proposed that:

- The incentive structure of the staff working in field needs to be revised and should be based on fix/variable salary, based on the performance
- Balance scorecards needs to be introduced to monitor KPIs and performance incentive
- Ufone needs to increase the stakes of field workers in the company by offering organization wise performance based bonus
- Regularize the work force, providing them with the entitlement gratuity and provident fund – a key contributor to employee loyalty

ANNEXURES

Annex–1: Monthly trend Telco vs. Non-Telco outages

Month	Outages in terms of No of Hits	Outage Time in Hours	Outages in terms of No of Hits (Non-Telco)	Outage Time in Hours (Non-Telco)
January	**83,451**	**25,643**	**16,690**	**14,972**
February	**90,332**	**26,052**	**18,066**	**15,210**
March	**92,212**	**29,568**	**18,442**	**17,263**
April	**88,312**	**32,576**	**17,662**	**19,019**
May	**99,312**	**33,576**	**19,862**	**19,603**
June	**106,494**	**39,063**	**21,925**	**22,807**
July	**116,943**	**44,134**	**23,389**	**25,767**
August	**104,012**	**37,875**	**20,802**	**22,113**
September	**93,123**	**30,564**	**18,625**	**17,845**
October	**87,323**	**28,065**	**17,465**	**16,386**
November	**84,322**	**27,479**	**16,864**	**16,043**
December	**82,323**	**24,123**	**16,465**	**14,084**

Annex-2: Issue wise breakdown of Non-Telco outages in June 2015

Issue	No of hits
DG Faulty-MS: Auto Start Issue	**6075**
OMO: OMO DG Faulty	**4328**
OMO: OMO DG Starting issue	**4320**
OMO: DG starting issue	**3674**
DG Faulty-MS: Part Faulty/ Replacement	**2197**
DG Fuel: No Fuel/Refueling Required	**1768**
ACB: Prolonged wapda shutdown (without DG site)	**1752**
DS: OMO Power/DG Fault Issue	**1517**
Theft Issues: Fuel Theft	**1411**
OMO: DG not started due to fuel saving	**1228**
Access Issue: Fuel/Power Theft by guard	**1132**
C.P: Micro Site/No DG/CP Outage	**1092**
OMO: OMO DG Fueling issue	**978**
HUB site: DG issue	**712**
Access Issue: DG Switched to manual	**553**
Access Issue: DG Over-rest by Guard/Owner/Operator	**328**
Access Issue: Guard Unavailable at site	**287**
DG Faulty-Project: Project Owned Rental DG Faulty	**287**
DG Faulty-MS: Other	**264**
DG Faulty: Overhauling required	**191**
DG Faulty-MS: ATS Panel Faulty	**166**
DS: DG Faulty	**150**
DG Faulty: Post DG Overhauling Issues	**117**
DG Faulty-MS: MS Owned Rental DG faulty	**116**

OMO: OMO DG Underrated	**64**
Access Issue: DG set sealed by Authorities	**46**
HUB site: DG fueling issue	**44**
Theft Issues: DG Part(s) Stolen	**37**
OMO: OMO DG backup power not provided (DG approved)	**32**
DG Faulty-MS: Battery Faulty	**30**
DS: Under Capacity DG at OMO hosted site	**24**
Theft Issues: DG Battery Stolen	**22**
Other Issue: DG Timer Issue	**20**
OMO: DG under rated	**17**
Access Issue: Guarded Sites Issues-Other	**16**
DG Faulty-MS: Air Lock	**15**
ACB: CP disconnection due to nonpayment (without DG site)	**12**

Annex-3: Numerical Data for Various Trend Analyses

Month	No of Hits	Outage Time in Hours	Revenue Loss
January	**83,451**	**25,643**	**6,915,968**
February	**90,332**	**26,052**	**7,416,433**
March	**92,212**	**29,568**	**7,609,196**
April	**88,312**	**32,576**	**8,112,531**
May	**99,312**	**33,576**	**8,029,582**
June	**106,494**	**39,063**	**8,884,811**
July	**116,943**	**44,134**	**9,939,878**
August	**104,012**	**37,875**	**9,639,353**
September	**93,123**	**30,564**	**8,522,869**
October	**87,323**	**28,065**	**6,902,844**
November	**84,322**	**27,479**	**6,595,142**
December	**82,323**	**24,123**	**6,390,178**

Non-Telco Outages Monthly Trend (Hits)

Month	No Of Outages	No Of Outage Hour
January	**67,451**	**56**
February	**72,332**	**60**
March	**74,212**	**62**
April	**79,121**	**66**
May	**78,312**	**65**
June	**86,653**	**72**
July	**96,943**	**81**
August	**94,012**	**78**
September	**83,123**	**69**
October	**67,323**	**56**
November	**64,322**	**53**
December	**62,323**	**52**

Hits vs Hours Monthly analysis

Date	Hits	Hours
6/1/2015	**2794**	**483**
6/2/2015	**3252**	**388**
6/3/2015	**3448**	**889**
6/4/2015	**2878**	**268**
6/5/2015	**3147**	**169**
6/6/2015	**2777**	**163**
6/7/2015	**3614**	**152**
6/8/2015	**4708**	**299**
6/9/2015	**3519**	**480**
6/10/2015	**5752**	**275**
6/11/2015	**3242**	**150**
6/12/2015	**3579**	**365**
6/13/2015	**3269**	**368**
6/14/2015	**3649**	**201**
6/15/2015	**2943**	**827**
6/16/2015	**3552**	**305**
6/17/2015	**3593**	**254**
6/18/2015	**3171**	**108**
6/19/2015	**3652**	**741**
6/20/2015	**4997**	**131**
6/21/2015	**3210**	**609**
6/22/2015	**3375**	**350**
6/23/2015	**3832**	**103**
6/24/2015	**4028**	**90**
6/25/2015	**3230**	**183**
6/26/2015	**3190**	**403**
6/27/2015	**3535**	**631**
6/28/2015	**3968**	**201**
6/29/2015	**4295**	**233**
6/30/2015	**2295**	**134**
Grand Total	**106,494**	**9,953**

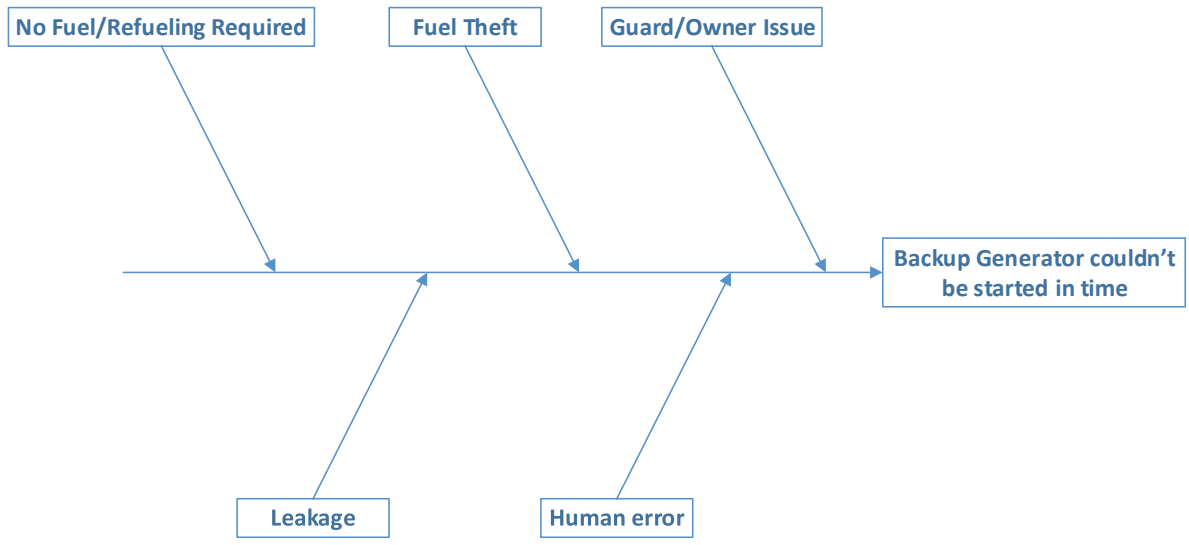
Annex–4: Monthly revenue loss due to outages

Month	Revenue Loss	Revenue Loss (Non-Telco)
January	**6,915,968**	**4,037,857**
February	**7,416,433**	**4,330,051**
March	**7,609,196**	**4,442,595**
April	**8,112,531**	**4,736,465**
May	**8,029,582**	**4,688,036**
June	**8,884,811**	**5,187,357**
July	**9,939,878**	**5,803,354**
August	**9,639,353**	**5,627,893**
September	**8,522,869**	**4,976,039**
October	**6,902,844**	**4,030,195**
November	**6,595,142**	**3,850,544**
December	**6,390,178**	**3,730,877**

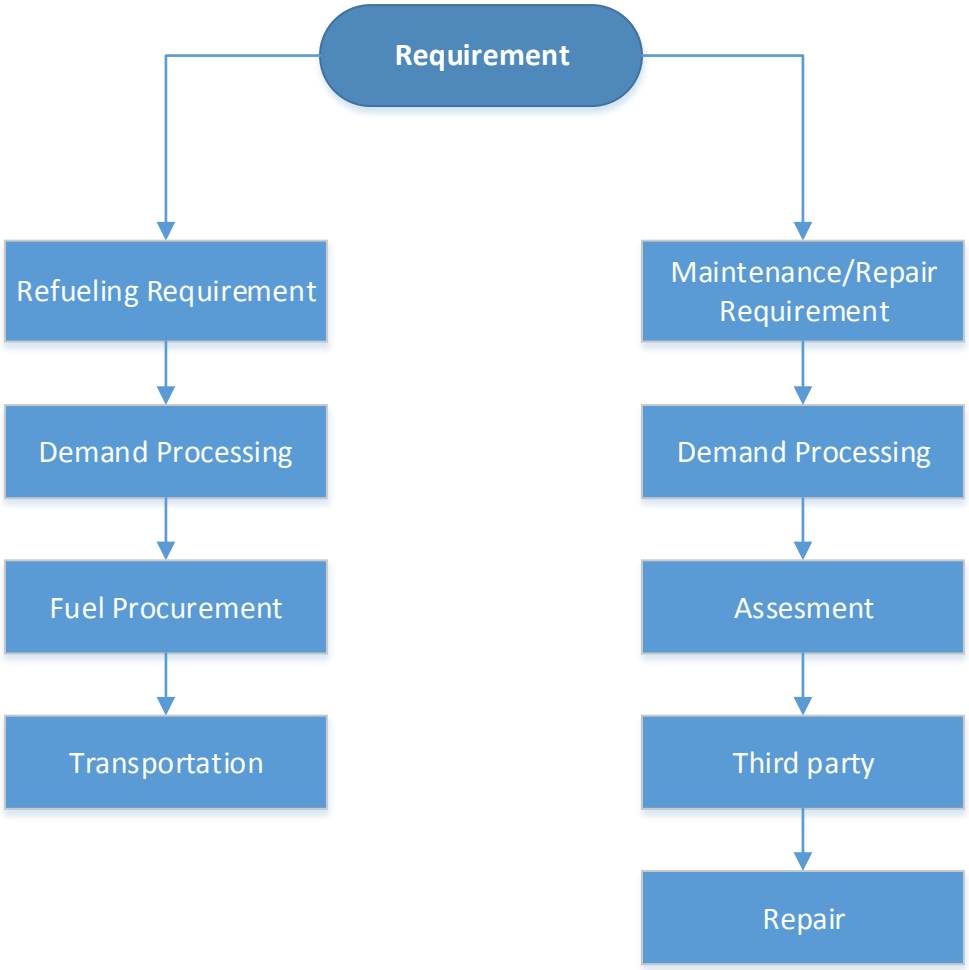
Annex-5: Data collection format (questionnaire)

Data Item	Information
Date	**Date of event**
Region	**Region of the event**
Start Time	**Start time of the outage**
End Time	**End time of the outage**
Outage Time (Mins)	**Duration of outage**
Responsibility	**Who is responsible**
OMCR Comments	**Comments by Operation And Maintenance Center Radio**
Outage Category	**Reason for outage**
Site Priority	**Priority of the site**
BSC	**Base station controller**
Phase	**Phase**
Sub Region	**Sub region**

Annex–6: Fishbone for Fueling related issues



Annex–7:Re-fueling Process & Genset Operation and Maintenance



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