# Impact of Load Factor on Distinct Feeders of 132/11 kV Grid Station in Distribution Network

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(Received January 28, 2020; Revised September 25, 2020; Accepted January 06, 2021)
***Online First Publication***
DOI: 10.33317/ssurj.163

***Abstract*— The poor Load Factor (LF) causes the tripping of transformers, heating of conducting material, failure of insulation and increase of the reactive power. Improving LF is an important issue to stabilize the power system. To investigate the power loss caused by the poor LF, the calculated peak and minimum load data loss at variable loads for times is analyzed. The low LF is calculated through collected data of minimum and maximum loads. The analysis of 7 feeders at 132/11kV grid station is carried out for this research purpose. The distribution system and analysis of load on different feeders are estimated through an investigation of site techniques. The major findings are discussed in the result and discussion section of this study.**

***Index Terms*— Energy Loss Minimization, Network Losses, Energy Consumption, Tariff, Peak Load.**

## I. INTRODUCTION

Recently the energy crises are the key issues all over the world. Energy crises are becoming hurdles in economic growth and also have an environmental cost because mostly fossil fuels are used and there is a need for renewable energy resources [1]. So this issue will become a challenge for developing countries and their increasing population [2]. In this scenario i.e., for increasing the efficiency of an electric system, the aim of the research is to analyze the potential of distributed resources although they do not decrease the efficiency of the system [3], [4].

The system should have an abundant capacity to certain the supply of fluctuating demand for electricity i.e., 100% of all the times with the minimum amount of equipment and energy input. Having the maximum efficiency may not be desirable but only if the system efficiency is reduced as a result of any issue [5], [6].

Following, there is a transmission which distributes electricity at high voltage from the huge generators to the rest of the system. For the electric load or demand, the quantity of electricity required by the consumer should be known in advance [7], [8].

The paper is distributed into 7 sections. In **Section I**, the energy and load factor has been discussed. In **Section II** and **Section III**, the research background has been described. In addition to this, the detailed distribution system has been discussed. In **Section IV**, the loss reduction techniques device specifications, and energy losses based on the usage model have been discussed. The impact of Load Factor (LF) on distribution has been discussed in **Section V**. The detailed analysis of 132/11 kV feeders has been presented in **Section VI**. Conclusion and future work have been presented in **Section VII** and **Section VIII** respectively.

## II. TECHNICAL LOSSES

The technical losses are due to the inherent electrical properties of system components [9]. These losses can occur in the system because of the Corona Effect. The transformer iron, eddy current, conductor and Ohmic losses are part of the electrical losses in the system. Transformer losses are divided into two parts: Discharge Loss and Pressure Loss [10]. The discharge loss is generated by the energy required to keep the core flowing constantly and as the load of the transformer changes, depending on the load, the resistance loss of the coil conductor will produce a voltage drop [11].

## III. NON-TECHINCAL LOSSES

These are occurred due errors caused by humans, improper installation and handling of the meter and unauthorized meter users (especially theft). It is a great dilemma for our declining generation of electricity as the administration’s concerns are with the office while consumers are involved in unfair means. In some cases, when a large system has a total power loss, it is clear that part of the non-technical loss is serious, from 3% to 6% [12]; depending on the length, service life, system line voltage level and other factors [13]. It is estimated that in some third world countries the power of theft is astonishingly high i.e., 10% to 40%, while in developed countries it is more than 3% [14].

## IV. TECHNIQUES OF LOSSES REDUCTION

The most effective technologies for reducing the loss of power distribution systems are feeder repair [15], power distribution or Distributed Generation (DG) up-gradation, reactive power compensation analysis [16] and reduction/control of non-technical damage to smart metering devices.

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Reducing losses and maximizing balance is the main step to re-configure the network. Re-configuring the feeder distribution system to reduce feeders, reduce load balance and improve system security is a very important task [17], [18].
The feeder may change the switching speed, returning from the feeder to the open and closed state of another feeder. The best re-structuring of the network depends on automatic circuit breakers that respond to network topology changes [19].
Applying small quantities of Distributed Generation (DG) can reduce power consumption until it reaches the lowest level. After reaching this lowest level, the level of infiltration increases and then the losses begin to increase somewhat [20]. Increasing the level of DG penetration will increase the loss. Controllable capacitors can also be used to reduce active power and increase voltage [21], [22].

## V. IMPACT OF LOAD FACTOR ON DISTRIBUTION LOSSES

Consumer electricity consumption varies throughout the day and the season. Residential users usually draw the highest electricity demand in the evening. The same commercial customer load usually peaks in the afternoon. Because the current level is the main cause of distributed power loss, maintaining a high power consumption level throughout the day will reduce peak power loss and overall power loss [23]. No need to enter LFs for the sale of public tube wells and traction in medium/large industries power. The power and electricity consumption of this survey can be explored in two industries [8-10]. Most demand readings are directly related to industry and demand meter tube-wells [24].

## VI. RESULT AND DISCUSSION

The LF is calculated in percentage, which plays an important role in the efficiency and reliability of the electrical system. Good energy consumption per kilowatt-hour (kWh) depends on a good LF in terms of energy consumption. Increase the LF and reduce the cost of electricity consumption, while the electric charge component plays an important role in the efficiency of the electrical system using electrical load components; By improving the LF, the power system increases the reliability, safety and stability of the system from power generation customers. This is because the average load increases with decreasing peak load and the load on the system are running regularly, no reactive force is generated and the electrical equipment also works with confidence and reliability. In general, improving the LF is a necessary concept of a power system.
The maximum, minimum and average, load of different feeders for the years 2016-2018 are shown in Table I. The LF calculations of all feeders for the years 2016-2018 are laid out in Table II.

**Table I: Maximum, Minimum and Average Loads of Distinct Feeders for the Years 2016-2018**

| S. No. | Feeder's Name | 2016 | | | 2017 | | | 2018 | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Max. Load (kW) | Min. Load (kW) | Avg. Load (kW) | Max. Load (kW) | Min. Load (kW) | Avg. Load (kW) | Max. Load (kW) | Min. Load (kW) | Avg. Load (kW) |
| 1 | Tube Well | 475 | 120 | 297.5 | 450 | 110 | 280 | 500 | 130 | 315 |
| 2 | New Petaro | 130 | 40 | 85 | 120 | 30 | 75 | 125 | 32 | 78.5 |
| 3 | LMC | 250 | 58 | 154 | 255 | 60 | 157.5 | 248 | 56 | 152 |
| 4 | OCF-I | 75 | 25 | 50 | 80 | 30 | 55 | 70 | 20 | 45 |
| 5 | OCF-II | 140 | 48 | 94 | 120 | 28 | 74 | 130 | 30 | 80 |
| 6 | Old Petaro | 100 | 25 | 62.5 | 110 | 35 | 72.5 | 98 | 20 | 59 |
| 7 | Allama I.I. Qazi | 300 | 65 | 182.5 | 305 | 60 | 182.5 | 298 | 60 | 179 |

Furthermore, it has been observed through Fig. 1, that the maximum load was higher on Tube-Well and Allama I. I. Qazi feeders, which were 315 and 300 in 2018, as compared rest of the feeders.

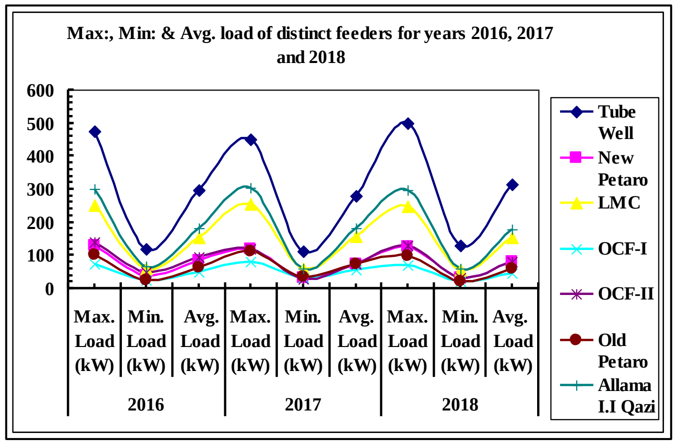


**Fig. 1: Illustration of Maximum, Minimum and Average Loads of Distinct Feeders for the Years 2016-2018**

**Table II: Calculations of Load Factor of Distinct Feeders for the Years 2016-2018**

| S. No. | Feeder's Name | Load Factor | | |
|---|---|---|---|---|
| | | 2016 | 2017 | 2018 |
| 1 | Tube Well | 62.63 | 62.22 | 63 |
| 2 | New Petaro | 65.38 | 62.5 | 62.8 |
| 3 | LMC | 61.6 | 61.76 | 61.29 |
| 4 | OCF-I | 66.67 | 68.75 | 64.28 |
| 5 | OCF-II | 67.14 | 61.66 | 61.53 |
| 6 | Old Petaro | 62.5 | 65.9 | 60.2 |
| 7 | Allama I.I Qazi | 60.83 | 59.83 | 60.06 |

The graphical illustration of calculations based on LF of distinct feeders for the years 2016-2018 are shown in Fig. 2.

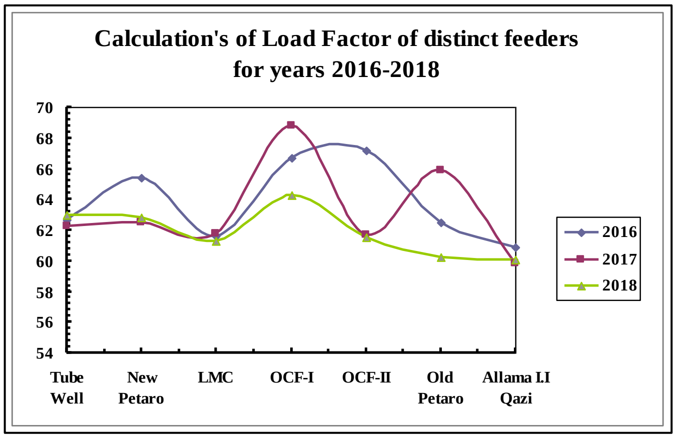


**Fig. 2: Calculations of Load Factor of Distinct Feeders for the Years 2016-2018**

Comparing of minimum and maximum load and their calculations in terms of saving of different feeders of 132/11 kV Gird Station Jamshoro for 2018 are presented in Table III. The length of different feeders such as the Tube well feeder is about 15 km.

**Table III: Comparison of Minimum and Maximum Loads and the Resultant Annual Savings of Tube-Well Feeder for the Year 2018**

| Month's | Voltage | p. f | Peak Position Load (Amp.) | Declined Peak Position Load (Amp.) | Peak Position Load (Units) | Declined Peak Position Load (Units) | Save Units | Peak Position Load (Cost) | Cost of Declined Load | Save Rupees |
|---|---|---|---|---|---|---|---|---|---|---|
| January | 220 | 0.8 | 150 | 100 | 19008 | 12672 | 6336 | 180576 | 102769.92 | 77806.1 |
| February | 220 | 0.8 | 147 | 102 | 18627.8 | 12925.44 | 5702.4 | 176964.4 | 104825.31 | 72139.1 |
| March | 220 | 0.83 | 158 | 90 | 20772.6 | 11832.48 | 8940.09 | 197339.4 | 95961.41 | 101378 |
| April | 220 | 0.82 | 170 | 110 | 22081 | 14287.68 | 7793.2 | 209769.1 | 115873.08 | 93896 |
| May | 220 | 0.83 | 200 | 115 | 26294.4 | 15119.28 | 11175.1 | 249796.8 | 122617.36 | 127179 |
| June | 220 | 0.84 | 350 | 160 | 46569.6 | 21288.96 | 25280.6 | 442411.2 | 172653.46 | 269758 |
| July | 220 | 0.8 | 475 | 290 | 60192 | 36748.8 | 23443.2 | 571824 | 298032.76 | 273791 |
| August | 220 | 0.78 | 470 | 300 | 58069.4 | 37065.6 | 21003.8 | 551659.6 | 300602.01 | 251058 |
| September | 220 | 0.8 | 465 | 305 | 58924.8 | 38649.6 | 20275.2 | 559785.6 | 313448.25 | 246337 |
| October | 220 | 0.8 | 380 | 200 | 48153.6 | 25344 | 22809.6 | 457459.2 | 205539.84 | 251919 |
| November | 220 | 0.75 | 200 | 130 | 23760 | 15444 | 8316 | 225720 | 125250.84 | 100469 |
| December | 220 | 0.8 | 160 | 125 | 20275.2 | 12672 | 7603.2 | 192614.4 | 102769.92 | 89844.5 |
| **Total Annual Saving Rupees** | | | | | | | **Rs 1955575.54** | | | |

It is clear from Fig. 3 that high and low load units occurred in July and January for the year 2018 respectively.

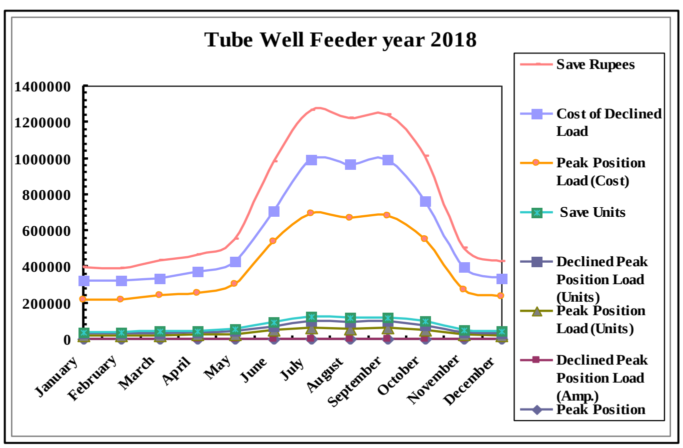


**Fig. 3: Illustration of Load and Annual Savings of Tube Well Feeder for the Year 2018**

The Table IV presents different categories of units for the year 2018, from which maximum units saved in rupees was in the month of June by New Petaro feeder is shown. It is important to mention that 20 km is the length of New Petaro feeder. Graphical results are presented in Fig. 4 and the maximum demand for units has been observed in June.

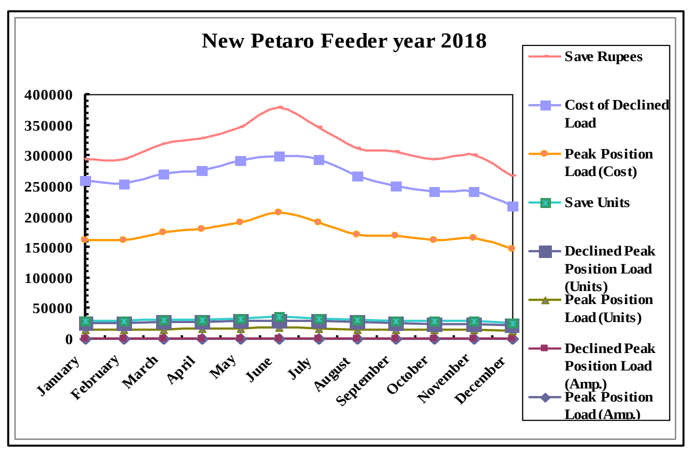


**Fig. 4: Illustration of Load and Annual Savings of New Petaro Feeder for the Year 2018**

**Table IV: Comparison of Minimum and Maximum Loads and the Resultant Annual Savings of New Petaro Feeder for the Year 2018**

| Month's | Voltage | p. f | Peak Position Load (Amp.) | Declined Peak Position Load (Amp.) | Peak Position Load (Units) | Declined Peak Position Load (Units) | Save Units | Peak Position Load (Cost) | Cost of Declined Load | Save Rupees |
|---|---|---|---|---|---|---|---|---|---|---|
| January | 220 | 0.8 | 110 | 95 | 13939.2 | 12038.4 | 1900.8 | 132422.4 | 97631.4 | 34791 |
| February | 220 | 0.8 | 110 | 90 | 13939.2 | 11404.8 | 2534.4 | 132422.4 | 92492.9 | 39929.5 |
| March | 220 | 0.83 | 115 | 90 | 15119.3 | 11832.48 | 3286.8 | 143633.2 | 95961.4 | 47671.8 |
| April | 220 | 0.82 | 120 | 90 | 15586.6 | 11689.92 | 3896.64 | 148072.3 | 94805.2 | 53267.1 |
| May | 220 | 0.83 | 125 | 95 | 16434 | 12489.84 | 3944.16 | 156123 | 101292.6 | 54830.4 |
| June | 220 | 0.84 | 135 | 85 | 17962.6 | 11309.76 | 6652.8 | 170644.3 | 91722.15 | 78922.2 |
| July | 220 | 0.8 | 130 | 100 | 16473.6 | 12672 | 3801.6 | 156499.2 | 102769.9 | 53729.3 |
| August | 220 | 0.78 | 120 | 95 | 14826.2 | 11737.44 | 3088.8 | 140849.2 | 95190.6 | 45658.6 |
| September | 220 | 0.8 | 115 | 80 | 14572.8 | 10137.6 | 4435.2 | 138441.6 | 82215.9 | 56225.7 |
| October | 220 | 0.8 | 110 | 78 | 13939.2 | 9884.16 | 4055.04 | 132422.4 | 80160.5 | 52261.9 |
| November | 220 | 0.75 | 120 | 80 | 14256 | 9504 | 4752 | 135432 | 77077.4 | 58354.6 |
| December | 220 | 0.8 | 100 | 70 | 12672 | 8870.4 | 3801.6 | 120384 | 71938.9 | 48445.1 |
| **Total Annual Saving Rupees** | | | | | | | | **Rs 624087.13** | | |

Throughout the year 2018, it has been analyzed that the cost of peak load is higher for the month of June than other months, in Liaquat Medical College (LMC) feeder. This is presented in Table V. The length of LMC feeder is 6 km; its results are graphically shown in Fig. 5.

**Table V: Comparison of Minimum and Maximum Loads and the Resultant Annual Savings of LMC Feeder for the Year 2018**

| Month's | Voltage | p. f | Peak Position Load (Amp.) | Declined Peak Position Load (Amp.) | Peak Position Load (Units) | Declined Peak Position Load (Units) | Save Units | Peak Position Load (Cost) | Cost of Declined Load | Save Rupees |
|---|---|---|---|---|---|---|---|---|---|---|
| January | 220 | 0.8 | 180 | 140 | 22809.6 | 17740.8 | 5068.8 | 216691.2 | 143877.8 | 72813.4 |
| February | 220 | 0.8 | 190 | 150 | 24076.8 | 19008 | 5068.8 | 228729.6 | 154154.8 | 74574.8 |
| March | 220 | 0.83 | 200 | 160 | 26294.4 | 21035.52 | 5258.8 | 249796.8 | 170598.06 | 79198.7 |
| April | 220 | 0.82 | 210 | 175 | 27276.5 | 22730.4 | 4546.08 | 259126.5 | 184343.5 | 74783 |
| May | 220 | 0.83 | 220 | 185 | 28923.8 | 24322.32 | 4601.52 | 274776.4 | 197254.01 | 77522.4 |
| June | 220 | 0.84 | 240 | 190 | 31933.4 | 25280.64 | 6652.8 | 303367.7 | 205025.99 | 98341.7 |
| July | 220 | 0.8 | 250 | 210 | 31680 | 26611.2 | 5068.8 | 300960 | 215816.83 | 85143.2 |
| August | 220 | 0.78 | 230 | 190 | 28416.7 | 23474.88 | 4941.81 | 269961.1 | 190381.27 | 79579.9 |
| September | 220 | 0.8 | 210 | 180 | 26611.2 | 22809.6 | 3801.6 | 252806.4 | 184985.85 | 67820.6 |
| October | 220 | 0.8 | 200 | 170 | 25344 | 21542.4 | 3801.6 | 240768 | 174708.86 | 66059.1 |
| November | 220 | 0.75 | 180 | 150 | 21384 | 17820 | 3564 | 203148 | 144520.2 | 58627.8 |
| December | 220 | 0.8 | 170 | 130 | 21542.4 | 16473.6 | 5068.8 | 204652.8 | 133600.8 | 71052 |
| **Total Annual Saving Rupees** | | | | | | | | **Rs. 905516.53** | | |

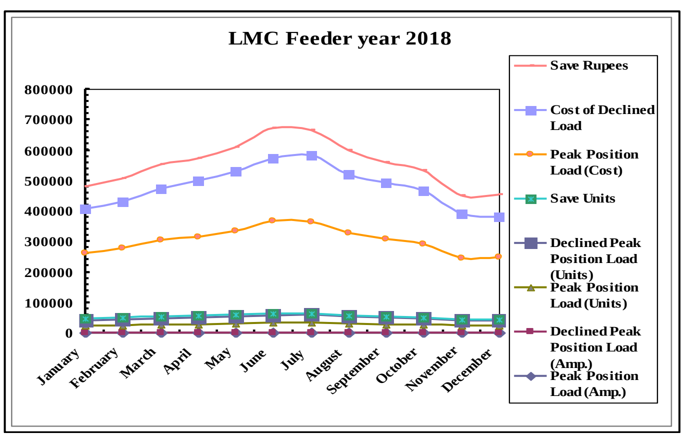


**Fig. 5: Illustration of Load and Annual Savings of LMC Feeder for the Year 2018**

The comparison of savings of all the feeders of 132/11kV Gird Station Jamshoro is depicted below by analyzing minimum and maximum load, for the year 2018 are presented in Tables i.e., Table VI, Table VII, Table VIII and Table IX and its graphical representation response has been shown in below Figures i.e., Fig. 6, Fig.7, Fig. 8 and Fig. 9 respectively.

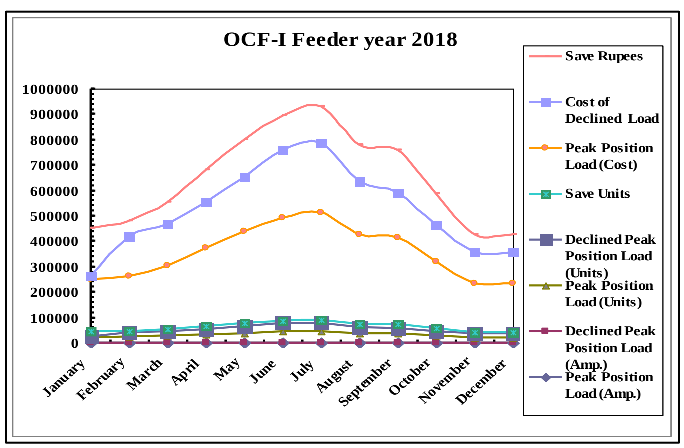


**Fig. 6: Illustration of Load and Annual Savings of OCF-I Feeder for the Year 2018**

**Table VI: Comparison of Minimum and Maximum Loads and the Resultant Annual Savings of OCF-I Feeder for the Year 2018**

| Month's | Voltage | p. f | Peak Position Load (Amp.) | Declined Peak Position Load (Amp.) | Peak Position Load (Units) | Declined Peak Position Load (Units) | Save Units | Peak Position Load (Cost) | Cost of Declined Load | Save Rupees |
|---|---|---|---|---|---|---|---|---|---|---|
| January | 220 | 0.8 | 170 | 130 | 21542.4 | 1647.6 | 19894.8 | 204652.8 | 13362.02 | 191291 |
| February | 220 | 0.8 | 180 | 150 | 22809.6 | 19008 | 3801.6 | 216691.2 | 154154.88 | 62536.3 |
| March | 220 | 0.83 | 200 | 155 | 26294.4 | 20378.16 | 5916.2 | 249796.8 | 165266.87 | 84529.9 |
| April | 220 | 0.82 | 250 | 170 | 32472 | 22080.96 | 10391 | 308484 | 179076.58 | 129407 |
| May | 220 | 0.83 | 290 | 200 | 38126.3 | 26294.4 | 11832.4 | 362205.3 | 213247.58 | 148958 |
| June | 220 | 0.84 | 320 | 250 | 42577.9 | 33264 | 9313.9 | 404490.2 | 269771.04 | 134719 |
| July | 220 | 0.8 | 350 | 270 | 44352 | 34214.4 | 10137.6 | 421344 | 277478.78 | 143865 |
| August | 220 | 0.78 | 300 | 210 | 37065.6 | 25945.92 | 11119.7 | 352123.2 | 210421.41 | 141702 |
| September | 220 | 0.8 | 285 | 170 | 36115.2 | 21542.4 | 14572.8 | 343094.4 | 174708.86 | 168386 |
| October | 220 | 0.8 | 220 | 140 | 27878.4 | 17740.8 | 10137.6 | 264844.8 | 143877.88 | 120967 |
| November | 220 | 0.75 | 170 | 130 | 20196 | 15444 | 4752 | 191862 | 125250.84 | 66609.2 |
| December | 220 | 0.8 | 160 | 120 | 20275.2 | 15206.4 | 5068.8 | 192614.4 | 123322.9 | 69291.5 |
| **Total Annual Saving Rupees** | | | | | | | **Rs. 1462261.45** | | | |

**Table VII: Comparison of Minimum and Maximum Loads and the Resultant Annual Savings of OCF-II Feeder for the Year 2018**

| Month's | Voltage | p. f | Peak Position Load (Amp.) | Declined Peak Position Load (Amp.) | Peak Position Load (Units) | Declined Peak Position Load (Units) | Save Units | Peak Position Load (Cost) | Cost of Declined Load | Save Rupees |
|---|---|---|---|---|---|---|---|---|---|---|
| January | 220 | 0.8 | 95 | 70 | 12038.4 | 8870.4 | 3168 | 114364.8 | 71938.9 | 42425.9 |
| February | 220 | 0.8 | 110 | 80 | 13939.2 | 10137.6 | 3801.6 | 132422.4 | 82215.9 | 50206.5 |
| March | 220 | 0.83 | 115 | 85 | 15119.3 | 11175.12 | 3944.16 | 143633.1 | 90630.22 | 53002.9 |
| April | 220 | 0.82 | 110 | 80 | 14287.7 | 10391.04 | 3896.64 | 135732.9 | 84271.33 | 51461.6 |
| May | 220 | 0.83 | 120 | 90 | 15776.6 | 11832.48 | 3944.16 | 149878.1 | 95961.41 | 53916.7 |
| June | 220 | 0.84 | 130 | 95 | 17297.3 | 12640.32 | 4656.96 | 164324.1 | 102512.99 | 61811.1 |
| July | 220 | 0.8 | 140 | 100 | 17740.8 | 12672 | 5068.8 | 168537.6 | 102769.92 | 65767.7 |
| August | 220 | 0.78 | 120 | 90 | 14826.2 | 11119.68 | 3706.56 | 140849.2 | 90180.6 | 50668.6 |
| September | 220 | 0.8 | 115 | 85 | 14572.8 | 10771.2 | 3801.6 | 138441.6 | 87354.43 | 51087.2 |
| October | 220 | 0.8 | 110 | 80 | 13939.2 | 10137.6 | 3801.6 | 132422.4 | 82215.93 | 50206.5 |
| November | 220 | 0.75 | 100 | 70 | 11888 | 8316 | 3572 | 112936 | 67442.76 | 45493.2 |
| December | 220 | 0.8 | 90 | 60 | 11404.8 | 7603.2 | 3801.6 | 108345.6 | 61661.95 | 46683.7 |
| **Total Annual Saving Rupees** | | | | | | | **Rs 622731.44** | | | |

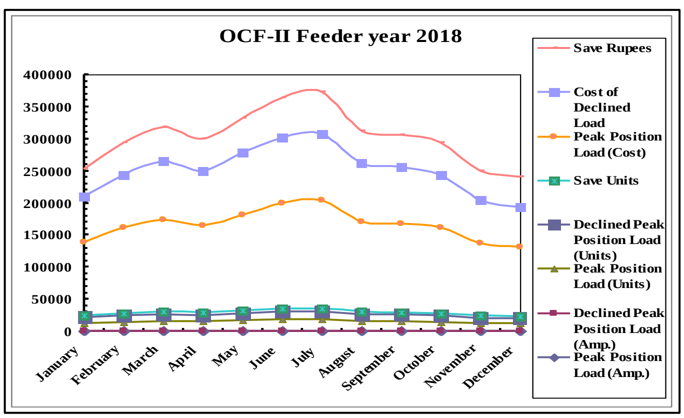


**Fig. 7: Illustration of Load and Annual Savings of OCF-II Feeder for the Year 2018**

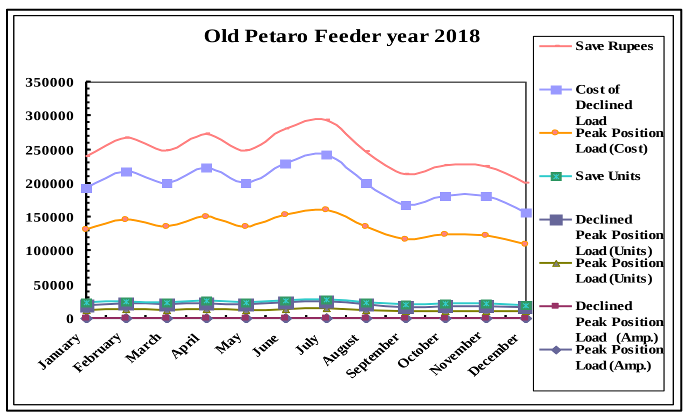


**Fig. 8: Illustration of Load and Annual Savings of Old Petaro Feeder for the Year 2018**

**Table VIII: Comparison of Minimum and Maximum Loads and the Resultant Annual Savings of Old Petaro Feeder for the Year 2018**

| Month's | Voltage | p. f | Peak Position Load (Amp.) | Declined Peak Position Load (Amp.) | Peak Position Load (Units) | Declined Peak Position Load (Units) | Save Units | Peak Position Load (Cost) | Cost of Declined Load | Save Rupees |
|---|---|---|---|---|---|---|---|---|---|---|
| January | 220 | 0.8 | 90 | 60 | 11404.8 | 7603.2 | 3801.6 | 108345.6 | 61661.95 | 46683.7 |
| February | 220 | 0.8 | 100 | 70 | 12672 | 8870.4 | 3801.6 | 120384 | 71938.94 | 48445.1 |
| March | 220 | 0.83 | 90 | 60 | 11832.5 | 7888.32 | 3944.16 | 112408.6 | 63974.27 | 48434.3 |
| April | 220 | 0.82 | 100 | 70 | 12988.8 | 9092.16 | 3896.64 | 123393.6 | 73737.41 | 49656.2 |
| May | 220 | 0.83 | 90 | 60 | 11832.5 | 7888.32 | 3944.16 | 112408.6 | 63974.27 | 48434.3 |
| June | 220 | 0.84 | 100 | 70 | 13305.6 | 9313.92 | 3991.68 | 126403.2 | 75535.89 | 50867.3 |
| July | 220 | 0.8 | 110 | 80 | 13939.2 | 10137.6 | 3801.6 | 132422.4 | 82215.93 | 50206.5 |
| August | 220 | 0.78 | 95 | 65 | 11737.4 | 8030.88 | 3706.56 | 111505.7 | 65130.43 | 46375.3 |
| September | 220 | 0.8 | 80 | 50 | 10137.6 | 6336 | 3801.6 | 96307.2 | 51384.96 | 44922.2 |
| October | 220 | 0.8 | 85 | 55 | 10771.2 | 6969.6 | 3801.6 | 102326.4 | 56523.45 | 45803 |
| November | 220 | 0.75 | 90 | 60 | 10692 | 7128 | 3564 | 101574 | 57808.08 | 43765.9 |
| December | 220 | 0.8 | 75 | 45 | 9504 | 5702.4 | 3801.6 | 90288 | 46246.46 | 44041.5 |
| **Total Annual Saving Rupees** | | | | | | | | **Rs 567635.19** | | |

**Table IX: Comparison of Minimum and Maximum Loads and the Resultant Annual Savings of Allama I. I Qazi Feeder for the Year 2018**

| Month's | Voltage | p. f | Peak Position Load (Amp.) | Declined Peak Position Load (Amp.) | Peak Position Load (Units) | Declined Peak Position Load (Units) | Save Units | Peak Position Load (Cost) | Cost of Declined Load | Save Rupees |
|---|---|---|---|---|---|---|---|---|---|---|
| January | 220 | 0.8 | 210 | 165 | 26611.2 | 20908.8 | 5702.4 | 252806.4 | 169570.36 | 83236 |
| February | 220 | 0.8 | 230 | 150 | 2945.6 | 19008 | 10137.6 | 276883.2 | 154154.8 | 122728 |
| March | 220 | 0.83 | 240 | 180 | 31553.3 | 23664.96 | 7888.3 | 299756.1 | 191922.8 | 107833 |
| April | 220 | 0.82 | 260 | 190 | 33770.9 | 24678.72 | 9092.1 | 320823.3 | 200144.4 | 120679 |
| May | 220 | 0.83 | 280 | 210 | 36812.2 | 27609.12 | 9203.04 | 349715.5 | 223909.9 | 125806 |
| June | 220 | 0.84 | 290 | 220 | 38586.2 | 29272.32 | 9313.9 | 366569.2 | 237398.5 | 129171 |
| July | 220 | 0.8 | 300 | 225 | 38016 | 28512 | 9504 | 361152 | 231232.3 | 129920 |
| August | 220 | 0.78 | 230 | 180 | 28417 | 22239.36 | 6177.6 | 269961.1 | 180361.2 | 89599.9 |
| September | 220 | 0.8 | 200 | 140 | 25344 | 17740.8 | 7603.2 | 240768 | 143877.8 | 96890.2 |
| October | 220 | 0.8 | 180 | 120 | 22809.6 | 15206.4 | 7603.2 | 216691.2 | 123323.9 | 93367.3 |
| November | 220 | 0.75 | 160 | 90 | 19008 | 10692 | 8316 | 180576 | 86712.1 | 93863.9 |
| December | 220 | 0.8 | 150 | 70 | 19008 | 8870.4 | 10137.6 | 180576 | 71938.9 | 108637 |
| **Total Annual Saving Rupees** | | | | | | | | **Rs. 1301731.04** | | |

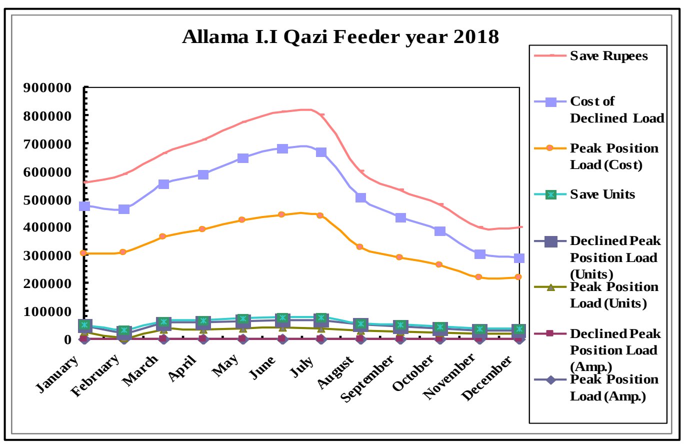


**Fig. 9: Illustration of Load and Annual Savings of Allama I. I Qazi Feeder for the Year 2018**

## VII. CONCLUSION

The Load Factor (LF) enhancements that is needed for the preferred results is the need of the hour because it gives essential data to Hyderabad Electric Supply Company (HESCO) i.e., the LF is low and it must be enhanced as per the requirements.

The improved LF protects from typical faults such as technical losses, Load shedding, and power demand.

It is suggested that instead of repairing the old equipment, they must be replaced by new equipment to fulfill energy demands on time.

This study is useful for Distribution Companies (DISCOs) and the customers. It is also beneficial for a secure and continuous supply of electricity.

From this research study, it is concluded that the load shedding can be reduced to an extent which is tolerable by the customers which is a major problem nowadays in our country.

## VIII. FUTURE WORK

It is recommended that HESCO should present seminars/programs/webinars publically to inspire all type of customer to help them manage their maximum loads according to HESCO's mentioned policy/instructions on electricity bill. The policy must be followed at all times which are only possible with customers support.

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