STUDY AND ANALYSIS ON 33KV TRANSMISSION LINE LOSS CALCULATION OF PABNA PBS-2

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ABSTRACT

Electrification of rural area plays a vital role for economic growth and social development of any country now. This is a study of how cost effective electric energy can be supplied that has been changing everyday life style in about 90 percent areas of Bangladesh. It's a journey from darkness to light of conflict between desire and hope after the liberation war. We try to figure out how electric energy supply more cost-effectively and with less of losses, which can be more safe and affordable to the rural. There are many factors which may have been contributing towards such change. Our study is a modest attempt to find any missing linkage in energy supply that could be less the losses of the supply.

Keywords: Rural Electrification, REP, BREB, PBS, System Loss.

I. Introduction

Power System is an integrated network that interconnects the installations for generation, transmission and distribution of electricity. In Bangladesh electricity is generated at 50 Hertz frequency and at a nominal voltage of 11 KV (Kilo Volts) or 15 KV to be stepped up through transformers to 132 kV or 230 kV for feeding to the grid i.e. a high voltage transmission network that transmits the power to grid substation transformers to be stepped down at 33 kV. 11 kV and 0.4 kV for delivery to the consumers of various categories. As of the year 2009, Bangladesh power grid comprises approximately 2314 circuit km (kilometres) 230 kV lines, 5533 circuit km 132 kV lines and 167 circuit km 66 kV transmission lines. The 230 kV and 66 kV lines are connected with the 132 kV network through 230/132 kV and 132/66 kV tie-bus transformers respectively. There are 85 grid substations that receive power from high voltage transmission lines and deliver it to the consumers through tens of thousands of kilometres 33 kV, 11 KV and 0.4 kV distribution lines.

In Bangladesh, electricity transmission is carried out by one sole entity-The Power Grid Company of Bangladesh Ltd. (PGCB). Three parties are responsible for Distribution: (i) the Bangladesh Power Development Board (BPDB): responsible for distribution of power in district towns (ii) the Rural electrification Board (REB) responsible for distribution of power in rural areas through 70 rural electric cooperatives (PBS) and (iii) Three Public Limited distribution companies – the Dhaka Power Distribution Company (DPDC), the Dhaka Electric Supply Company (DESCO) responsible for power distribution in Dhaka Metropolitan and Naryanganj, and the Western Zone Power Distribution Company Ltd, (WZPDCL), which covers the Khulna and Barisal Divisions.The entire sector is regulated by the Power Division, Ministry of Power, Energy & Mineral Resources and the statutory Bangladesh(BERC).

II. Transmission Sector: Power Grid Company of Bangladesh Ltd. (PGCB)

In Bangladesh the electricity transmission system (lines, grid substations and national load dispatch centre) is managed by the Power Grid Company of Bangladesh Ltd. (PGCB), a public limited company. Prior to its formation, the Bangladesh Power Development Board (BPDB) managed power generation, transmission systems, and distribution throughout Bangladesh. PGCB was established in November, 1996 as a fully BPDB owned company under the Power Sector Reform Program of the Government. The Government of Bangladesh decided to offload 25 percent of its shares i.e. a total of 91,08,940 Nos. of shares (BDT 100 each) through the Stock Exchanges under the Direct Listing system in order to bring public participation and more accountability into the company's activities. PGCB was listed on October 2006 at Dhaka Stock Exchange (DSE) and Chittagong Stock Exchange (CSE). Offloading of shares started on October 2006. PGCB was formed under the restructuring process of the Power Sector in Bangladesh with the objective of bringing private sector-like efficiency, including the establishment of higher accountability and dynamism in accomplishing its goals. PGCB is mainly concerned with the operation,0 maintenance and development of the power transmission system all over Bangladesh. The expansion of the grid network, including the installation of new transmission lines and grid substations are its assigned prime0 responsibility. After the formation of this company the transmission systems were gradually handed over to PGCB from BPDB. On December 2002 PGCB took over full responsibility of the total transmission system of Bangladesh. PGCB receives power from BPDB and private sector power generation companies and transmits the electricity to BPDB, REB and 3 other distribution companies. The power generated by different power plants all over the country is evacuated and transmitted through PGCB's integrated grid system by 230 kV and 132 kV transmission lines and substations. Currently, 400 kV transmission lines are under construction to expand the transmission network in the country between Aminbazar and Meghnaghat. There are two types of substations in the transmission facility. There were six 230/132 kV substations and sixty three 132/33 kV substations when PGCB took over from BPDB and the 32 Dhaka Electric Supply Authority (DESA). In 1996 when PGCB was formed, the total length of 230 Kv and 132 kV lines were 838 Circuit km and 4755 Circuit km respectively which increased to 1144 Circuit km and 4962 Circuit km respectively by the 2000-2001 fiscal year. At present there are 2647.3 Circuit km of 230 kV lines and 6015 Circuit km of 132 kV lines throughout Bangladesh under PGCB (total 8662.3 Circuit km). From the table below it can be seen that in 2011 amongst the two types of substations, there are thirteen 230/ 132 kV substations with the capacity of 7225 MVA and eighty one 132/33 kV substations with the capacity of 10492 MVA. Therefore, the total current substation capacity is 17,717 MVA.

III. History of Transmission

In the early days of commercial electric power, transmission of electric power at the same voltage as used by lighting and mechanical loads restricted the distance between generating plant and consumers. In 1882, generation was with direct current (DC), which could not easily be increased in voltage for long-distance transmission. Different classes of loads (for example, lighting, fixed motors, and traction/railway systems) required different voltages, and so used different generators and circuits. Due to this specialization of lines and because transmission was inefficient for low-voltage high-current circuits, generators needed to be near their loads. It seemed, at the time, that the industry would develop into what is now known as a distributed generation system with large numbers of small generators located near their loads. The transmission of electric power with alternating current (AC) became possible after Lucien Gaulard and John Dixon Gibbs built what they called the secondary generator, an early transformer provided with 1:1 turn ratio and open magnetic circuit, in 1881.

The first long distance AC line was 34 kilometres (21 miles) long, built for the 1884 International Exhibition of Turin, Italy. It was powered by a 2000 V, 130 Hz Siemens & Halske alternator and featured several Gaulard secondary generators with their primary windings connected in series, which fed incandescent lamps. The system proved the feasibility of AC electric power transmission on long distances. A very first operative AC line was put into service in 1885 in via dei Cerchi, Rome, Italy, for public lighting. It was powered by two Siemens & Halske alternators rated 30 hp (22 kW), 2000 V at 120 Hz and used 19 km of cables and 200 parallel-connected 2000 V to 20 V step-down transformers provided with a closed magnetic circuit, one for each lamp. Few months later it was followed by the first British AC system, which was put into service at the Grosvenor Gallery, London. It also featured Siemens alternators and 2400 V to 100 V step-down transformers one per user with shunt-connected primaries.

The rapid industrialization in the 20th century made electrical transmission lines and grids a critical infrastructure item in most industrialized nations. The interconnection of local generation plants and small distribution networks was greatly spurred by the requirements of World War I, with large electrical generating plants built by governments to provide power to munitions factories. Later these generating plants were connected to supply civil loads through long-distance-transmission.

IV.Background and Recent Trends of Transmission Sector in Bangladesh

In the early 1960s the first high voltage double circuit transmission line (132 kV) was built from Kaptai to Shidhirgonj (near Dhaka). There were substations (132/32 kV) at Chittagong, Feni and Comilla. This transmission line facilitated the transfer of power from the newly built Kaptai Hydro Station (80 MW), (commissioned in 1962) to Chittagong, Feni, Comilla and Shidhirgonj. Another 132 kV transmission line was also built from Shidhirgonj to Ullon, Dhaka. With the help of this transmission line and several other 33 kV lines, power was supplied from Shidhirgonj to the Dhaka area (in addition to the power received from Kaptai, power was also generated at the Shidhirgonj 30 MW power station). These transmission lines were followed by the Sylhet- Shahjibazar-AshugonjGhorashal- Shidhirgonj transmission lines, which connected the newly built Shahjibazar Power Station (1968), the Ashugonj Power Station (1970) and the Ghorashal Power Station (1974). The liberation war (1971) delayed the commissioning of the Ghorashal power station. At that time the Goalpara- Bheramar-Ishordi 132 kV transmission line was built; however it was gradually extended up to Thakurgaon. This line connected the Goalpara and Bheramara power stations to the load center on the western side of the Jamuna river. Following 1971 newly built power stations and a number of different load centers were connected to the Eastern Grid (on the Eastern side of Jamuna River) and the Western Grid (on the Western side of Jamuna River) by new T/Ls. In 1981 the first 230 kV transmission line from Ghorashal to Ishurdi inter-connecting the eastern and the western grid was commissioned. This line was initially energized at 132 kV. During the 1980s high capacity generation units were added to the Ghorashal and Ashugonj Power Stations. To transmit power from these power stations, new 230 kV transmission lines were built between Ghorashal–Ashuganj and Ghorashal- Tongi. At the same time the first east west interconnector was energized at 230 kV. In the nineties, a 230 kV transmission line from Raujan to Hatazari was commissioned to transmit power from the Raujan Power Station. In 2000, the Hatazari to Comilla North T/L was commissioned. The Ashuganj- Comilla and the Ghorashal- Haripur 230 kV transmission lines were commissioned few years earlier. These T/L constituted the backbone of the 230 kV lines of the eastern grid. After PGCB was formed in 1996, it started construction of a 230 kV backbone line for the western grid (Khulna- Ishurdi- Bharabari- Shirajganj- Barapukuria). New 230/132 kV substations were constructed at Aminbazar and Rampura to feed bulk power to the Dhaka area. The MeghnaghatHaripur- Amin Bazar and the Amin Bazar- Tongi 230 kV T/Ls were constructed to transmit power from IPP power stations at Haripur & Meghnaghat and also to feed the Amin Bazar

230/132 kV 225substation. Between 2002 and 2005 all the above mentioned T/Ls and Substations were commissioned. In 2008, a second east-west inter connector was commissioned connecting the Ashuganj Substation and the Shirajganj switching station. From this period till today many other 132 kV lines and substations were commissioned to feed more load centers, while at some other substations capacities were increased. As the acquisition of land is becoming difficult, particularly in city areas, the PGCB has started the construction of Gas Insulated Substations (GIS) with the extension of the Jaydebpur 132/33 kV substation using GIS units (2006) and commissioning the Gulshan (132/33 kV) GIS substation (2006). Another GIS was built in Gallamari, Khulna. There are also 230/132 kV GIS substations in the old airport area (Agargaon, Dhaka) along with three other 132/33 kV GISs in the Dhaka area. With the increase of load demands as well as power generation capacities, the PGCB has now started the construction of 400 kV transmission lines. The first 400 kV double circuit T/L between Aminbazar and Meghnaghat is expected to be commissioned (initially at 230 kV) in 2012-2013. Another 400 kV transmission line from Bibiayanabazar to Kaliyakar, with 400/230/132 kV substations at Kaliyakar is planned to facilitate transmission of power from the under construction IPP power stations at Bibiyana bazar which are expected to be commissioned during the later parts of 2012-13. Table 7A.1 of Appendix 7A shows the details of the ongoing projects in the transmission sector being implemented by the PGCB which are expected to be completed within next two years. The objective/ benefit of these projects as well as number of sub-stations with the number and capacity of Transformers for each substation are also shown in the table.

V. Overview on BREB

Energy and environmental policies are being shaped at the national and international levels in response to a wide range of challenges. Rural Electrification Program (REP) in Bangladesh started its journey in 1978, primarily with the technical assistance of National Rural Electrification Cooperative Association (NRECA) of United States of America with an aim to provide the electricity outside the urban strata. The program is based on the concept of member-owned, Palli Bidyut Samity (PBS) similar to the rural electric cooperatives that exist in the United States. Seventy-eight PBSs have been organized to date in Bangladesh.
Development plans of Bangladesh has identified rural electrification as one of the major components of overall infrastructure, implementation of which, it is held, can accelerate the pace of economic growth, employment generation, alleviation of poverty and improve living standard. A well planned and organizational rural electrification program was however, not existed till 1970s. The electrification program as carried out by the Bangladesh Power Development Board (BPDB) was mainly limited to urban centers and at best to their peripheries. At that time, the Government of Bangladesh engaged two consulting firms of USA to carry out a comprehensive feasibility study on rural electrification in Bangladesh. The firms studied all related issues in depth and put forward recommendation towards a sustainable and viable rural electrification program. In addition to the new institutional framework, the study emphasized for Area Coverage and Co-operative concept. It is against this backdrop, Rural Electrification (REB) was created by the Government of Bangladesh (GOB) in late 1970's through REB ordinance LI of 1977. The Board is a statutory Government organization primarily responsible for implementing countrywide rural electrification. The Rural Electrification Board of Bangladesh has been providing service to rural member consumers for over 39 years. Continued support from the Government of Bangladesh, the donor community, consulting partners, and member consumers will help this program continue to expand, providing the gift of electricity to millions more Bangladeshi households, businesses, and industries.

Rural Electrification Board Act, 2013 has been established instead of Rural Electrification Board Ordinance, 1977 (Ordinance No. LI of 1977) and the name of Board is Bangladesh Rural

Electrification Board, which was responsible for electrifying rural Bangladesh. Since its inception, the purpose of the program has been to use electricity as a means of creating opportunities for improving agricultural production and enhancing socio-economic development in rural areas, whereby there would be improvements in the standard of living and quality of life for the rural people. Today there are 77 operating rural electric cooperatives called Palli Bidyut Samity (PBS), which bring service to approximately 1,55,86,106 new connection being made and more than 3,14,692 km of line has been constructed.

VI. Overview on Pabna PBS 2

Since its inception in 1983, Pabna PBS-2 is playing a vital role in agriculture, industrial and socio-economic development of Pabna district. The Rural Electrification program conducted by Pabna PBS-2 has acted a leap-forward in the development of socio-economic structure of rural areas in Pabna district as well as entire Bangladesh. It has significant and sustained impact on life style, growth of business and commercial activities in rural areas. It is a consumer owned entity organized on basis of principles of co-operative for distribution of electric power to its member and operates on “NO Loss – No Profit” basis for the mutual benefits of all its members.
Here some information of Pabna PBS-2 up to Jun 2016:

4.1 Methodology

We were aware during the course of our study and following discussions with representatives of the power division of the Department of Rural Electrification that there were no established techniques or methodology in this field of socio-economic research. Indeed, in view of uniqueness of the areas studied and the scarcity of suitable data, it is doubtful if any but a most general methodology could be established. Accordingly we describe in greater detail than might be normal, the concepts, definitions and difficulties encountered in our approach to the study in the expectations that such descriptions will be of use in future studies. We highlight a number of reform options and recommendations for industry and household energy use policies. Losses are important as there is an environmental and economic cost associated with them.
In this research, a methodology or a model based on System dynamic approach has been develop to make more energy available at affordable prices to enable all people to use modern energy to meet their basic needs. To slow overall growth of energy consumption through conservation and energy efficiency improvement and to make energy sources more environmentally sustainable.
Today BREB have 78 operating rural electric cooperatives called Palli Bidyut Samity (PBS).For research, we choose the Pabna PBS-2 which is establish nearest us. We collected some primary data from Pabna PBS-2, BREB and BERC.

4.2 Objective

The scope of this study is the analysis of the costs that are associated with the system loss as well as the realization of new methods and tools concerning the calculation and the allocation of these costs. The power losses, which may charge to the market participants, are a central issue of the new cosmos of electricity markets. The increased requirement for fair and transparent pricing in the competitive environment as well as the complexity introduced by unbundling the services point out why this issue is of great importance. In general, the cost associated with the distributed power may be categorized as follows:
• Cost associated with the power losses.
• Fixed cost of the power system.

4.3 Substations of PPBS-2

There are 7 substations under PPBS-2 which are connected with two different grids. The energy storage and consumption different form one substation to another substation based on the location, consumer demand, industrial zone, transmission distance and many factors. The imported energy may reduce during the transmission process due to system loss. PPBS-2 all substation names with their capacity listed below.

1. Pabna-1(Masimpur), 10MVA
2. Sujanagar, 10 MVA
3. Bera-2 (Masumdia), 10 MVA
4. Kashinathpur, 15 MVA
5. Bera-1, 10 MVA
6. Bhaghabari, 10 MVA
7. Shanthia, 15 MVA

4.3.1 Grid Substations Under PPBS-2

There are 02 (two) Grid-Substations and 04 (four) No. 33kv feeder under PPBS-2.

A) 33kv feeder from Pabna Nurpur Grid

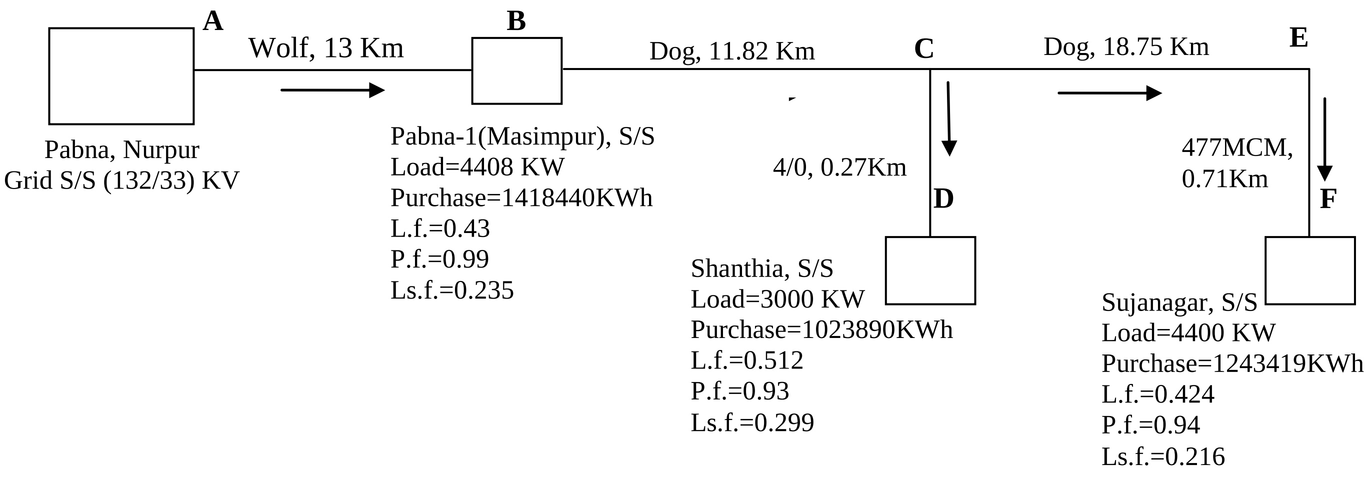
1. Kashinathpur 33 kv feeder.
2. Santhia 33 kv feeder.

B) 33kv feeder from Shahjadpur Grid

1. Kashinathpur 33 kv feeder.
2. Bera 33 kv feeder.

VII. Kashinathpur 33KV Source Line (Existing System) of PABNA PBS-2

Pabna PBS-2 has about 44.5 Km of high voltage transmission or source line from grid to its feeder under Pabna, Nurpur grid. There are 3 sub-station connected to the Pabna, Nurpur grid. This flow diagram shown with some major details below,



Sub-Station: Pabna-1, Shantnia & Sujanagar 33KV Feeder of Pabna PBS-2

5.1 Calculation of Losses under Pabna, Nurpur Grid

Combined Load = (3000+4400+4408) =11808 KW
Combined Consumption =3685749 KWH
Combined Load Factor = 0.445
Combined Loss Factor = 0.235
Normal Voltage = 27 KV – 33 KV
Average Voltage = 30 KV
Combined Load Factor of Pabna-1, Shantnia & Sujanagar S/S = 0.459
Power Interruption of S/S. = 77 Hour (Dec.`09)
Combined Loss Factor = 0.248
Approximately,
Resistance of Wolf conductor = 0.2069 Ω/Km
Resistance of Dog conductor = 0.3386 Ω/Km
Resistance of 4/0 ACSR = 0.3522 Ω/Km
Resistance of 477 MCM = 0.1342 Ω/Km.

$$\text{Monthly Loss (KWh)} = \frac{(\text{Peak KW})^2 * \text{R/Phase/Km} * \text{Ls.F} * \text{Length} * 3}{(\text{Avg. KV})^2 * (\text{pf})^2 * 3 * 1000}$$

$$= \frac{(\text{Peak KW})^2 * \text{R/Phase/Km} * \text{Ls.F} * \text{Length}}{(\text{Avg. KV})^2 * (\text{pf})^2 * 1000}$$

Load Ratio=S/S Load/Total S/S Load

Loss for "AB" Section

$$\text{Monthly Loss (KWh) for "Wolf" Conductor} = \frac{(11808)^2 * 0.2069 * 0.235 * 667 * 6.70 * 0.627}{(30)^2 * (0.95)^2 * 1000}$$

= 45376.19 KWh

Load Ratio=7400/11808=0.627

% of Loss = (45376.19*100) ÷ 3685749
= 1.231 %

Loss for "BC" Section

$$\text{Monthly Loss (KWh) for "Dog" Conductor} = \frac{(7400)^2 * 0.3386 * 0.248 * 667 * 11.82}{(30)^2 * (0.935)^2 * 1000}$$

= 46076.152 KWh

% of Loss = (46076.152*100) ÷ 2267309
= 2.032%

Loss for "CD" Section

$$\text{Monthly Loss (KWh) for "4/0" Conductor} = \frac{(3000)^2 * 0.3522 * 0.299 * 667 * 0.27}{(30)^2 * (0.93)^2 * 1000}$$

= 219.27 KWh

% of Loss = (219.27*100) ÷ 1023890
= 0.0214%

Loss for "CE" Section

Monthly Loss (KWh) for "Dog" Conductor = $\frac{(4400)^2 * 0.3386 * 0.216 * 667 * 18.75}{(30)^2 * (0.94)^2 * 1000}$

= 22267.68 KWh

% of Loss = (22267.68*100) ÷ 1243419
= 1.791%

Loss for "EF" Section

Monthly Loss (KWh) for "477 MCM" Conductor = $\frac{(4400)^2 * 0.1342 * 0.216 * 667 * 0.71 * 3}{(30)^2 * (0.94)^2 * 3 * 1000}$

= 334.19 KWh

% of Loss = (334.19*100) ÷ 1243419
= 0.0269%

% Total Loss = 5.102% (Grid S/S to Pabna-1, Shantnia & Sujanagar S/S Section)

A) 33KV LINE LOSS CALCULATION (EXISTING SYSTEM) Of PABNA PBS-2

Feeder	Section	KWH purchased	Days in Month	Outage in Hours	Total Hours	Average Demand, KW	Peak Demand, KW	Average Source Voltage, KV	Power Factor	Peak Current, Amp.	Load Factor	Loss Factor	Resisrance, Ohm/Km	Conductor	Section Distance, Km	Total Loss, KWH	Sub Total Loss KWH	% Loss
Kashinathpur-33 KV	AB	1418440	31	77	667	11808	7360	30	0.95	117.5	0.4590	0.2350	0.2069	Wolf	13	17462.022	122493.000	1.23
	BC	3863035	31	77	667	5791.65667	7360	30	0.93	181	0.4590	0.2990	0.3386	Dog	11.82	78447.635		2.03
	CD	3863035	31	77	667	5791.65667	7360	30	0.93	130	0.4590	0.2990	0.3522	4/0 ACSR	0.27	961.520		0.02
	CE	1417968	31	77	667	2125.88906	2380	30	0.94	96	0.4590	0.2160	0.3386	Dog	18.75	25288.993		1.78
	EF	1417968	31	77	667	2125.88906	2380	30	0.94	90	0.4590	0.2160	0.1342	477 MCM	0.71	333.577		0.02

Table 2: 33KV LINE LOSS (EXISTING SYSTEM)

B) 33KV LINE LOSS CALCULATION (PROPOSED SYSTEM) Of PABNA PBS-2

Feeder	Section	KWH purchased	Days in Month	Outage in Hours	Total Hours	Average Demand, KW	Peak Demand, KW	Average Source Voltage, KV	Power Factor	Peak Current, Amp.	Load Factor	Loss Factor	Resisrance, Ohm/Km	Conductor	Section Distance, Km	Total Loss, KWH	Sub Total Loss KWH	% Loss
Kashinathpur-33 KV	AB	1418440	31	77	667	11808	7360	30	0.95	117.5	0.4590	0.2350	0.1342	477 MCM	13	11326.261	53140.000	0.80
	BC	3863035	31	77	667	5791.65667	7360	30	0.93	181	0.4590	0.2990	0.1342	477 MCM	11.82	31091.768		0.80
	CD	3863035	31	77	667	5791.65667	7360	30	0.93	130	0.4590	0.2990	0.1342	477 MCM	0.27	366.371		0.01
	CE	1417968	31	77	667	2125.88906	2380	30	0.94	96	0.4590	0.2160	0.1342	477 MCM	18.75	10022.985		0.71
	EF	1417968	31	77	667	2125.88906	2380	30	0.94	90	0.4590	0.2160	0.1342	477 MCM	0.71	333.577		0.02

Table 3: 33KV LINE LOSS (PROPOSED SYSTEM)

Total KWh Save Per Month = Existing – Proposed
= (122493 – 53140) KWh/Month
= 69353 KWh/Month

C.1) DIFFERENCE BETWEEN EXISTING AND PROPOSED 33 KV LINE LOSS

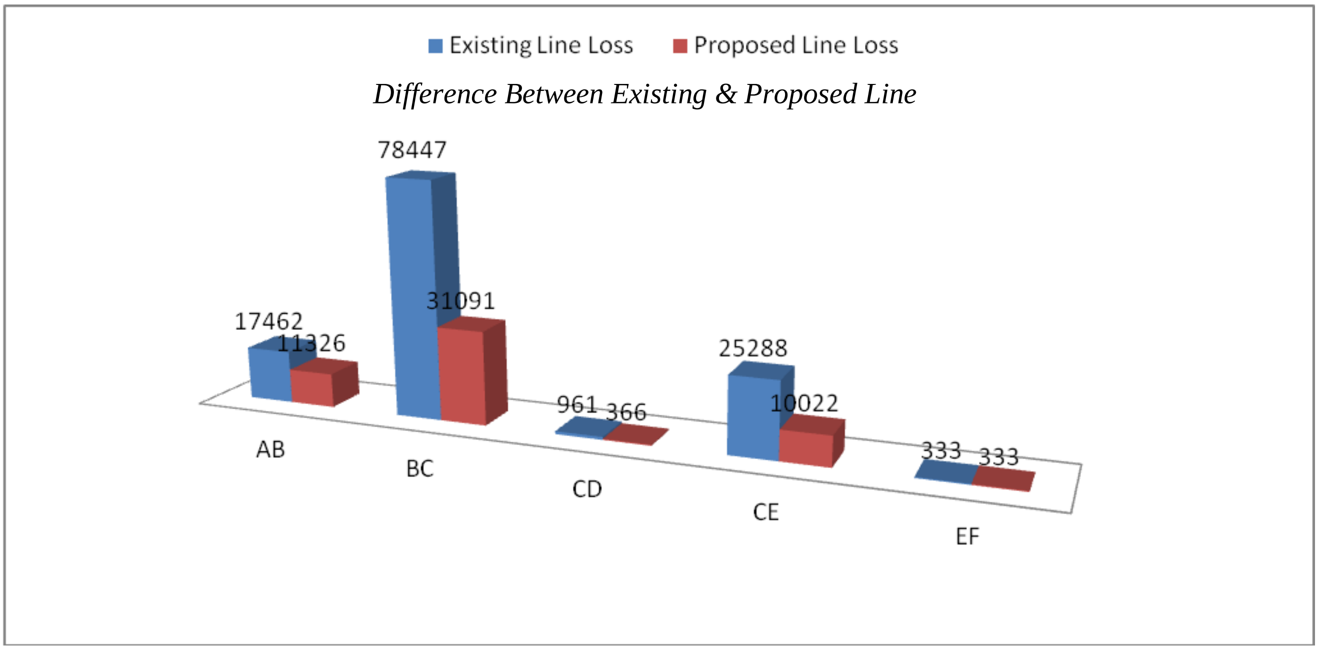


Chart: Difference Between Existing & Proposed 33 KV Line Loss.

C.2) DIFFERENCE BETWEEN EXISTING AND PROPOSED 33 KV LINE LOSS

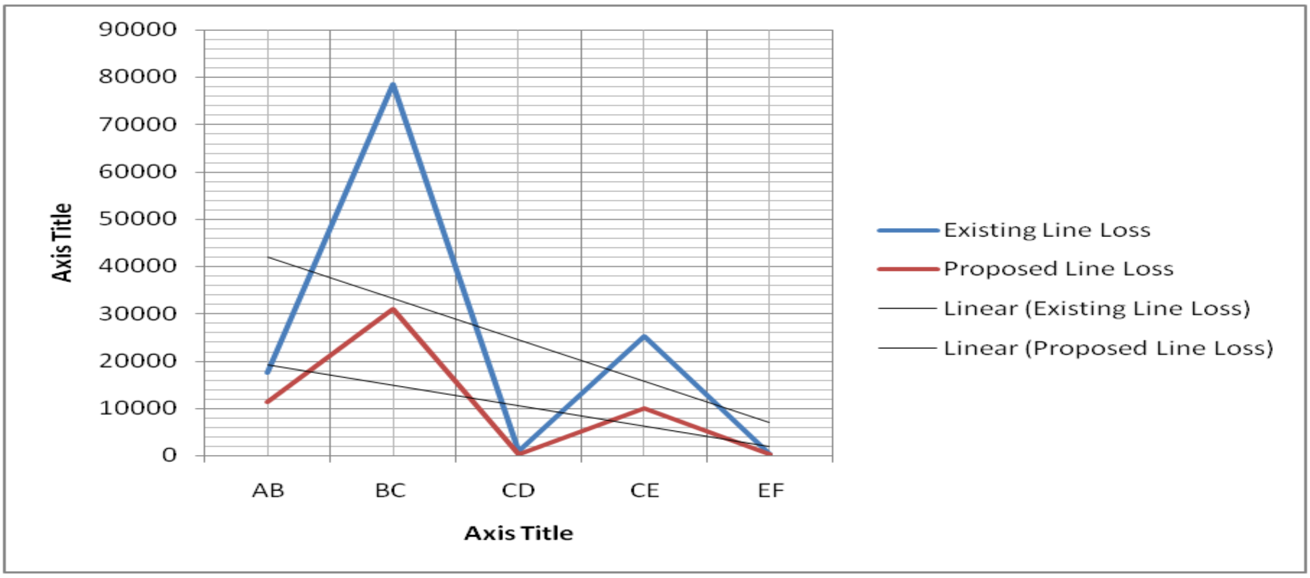


Chart: Difference Between Existing & Proposed 33 KV Line Loss.

VIII. Limitations

There are few limitations I have faced are mentioned below-

- In this study the data of PABNA PBS-2 we have used, collected from BREB (Bangladesh Rural Electrification Board) and PABNA PBS-2 but some of these data are assumption.
- In this research, we have discussed about electricity distribution loss structure and calculated the system but not the tariff rate of electric power. To calculate the total system loss of electric power transmission and distribution loss needs to be calculated along with the generation and transmission loss.
- This is a primary level research so that only electrical equations are being used. Any higher calculation or problems are not being discussed.
- Calculate losses under only Pabna, Nurpur Grid.

IX. Future Outline

Usually, loss of electrical power depends on transmission and distribution infrastructure. If electricity supply is high then the demand, loss rate will high and committed negative result. In this paper, we discussed about transmission of a PBS, how to calculate, with example. We also discussed about important terms. Interested people can study to calculate the Transmission Loss. This paper will also be helpful to get knowledge a stable electricity transmission & distribution structure to meet the future electricity circumstance of Bangladesh.

X. CONCLUSION

Loss of electricity is an important issue in our country. Because electricity loss (Technical) and distribution cost are related with our economic growth. When electricity loss rate becomes high then it affects on generation of electricity a lot. By thinking about them, electricity loss rate of our country should be low and only a few way we have to solve it. Government has given highest priority to power development in Bangladesh and is committed to generating electricity will sufficient for all citizens by 2021. Our government should take step for improvement our power station. In our power station, generators efficiency rate is low. It should be increased to a high value by taking necessary steps.

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