ENERGY AUDIT REPORT OF

NATIONAL ENGINEERING COLLEGE

An Autonomous Institution, Affiliated to Anna University Chennai

K. RAMASAMY NAGAR, KOVILPATTI – 628 503

THOOTHUKUDI DISTRICT, TAMIL NADU, INDIA

Report Prepared By

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Trichy, Tamil Nadu

TRY CAE

ENGINEERING | QUALITY | FINISHING SCHOOL

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GIST

1. Average power consumption of NEC is Rs.11 Lakhs per month in 2019.
2. Major power consumption of connected load is Air conditioner, which is 40% of the overall connected load.
3. Out of all buildings in NEC for connected load Mechanical consumes 13 % followed by CSE, S&H, Boy's & Girl's Hostel.
4. From the actual consumption reading using PQ, S&H consumes 16% followed by Mechanical, CSE, Boy's & Girl's Hostel.
5. On an average, all building consumes only 50% of the connected load (based on data from PQ).
6. As a low hang fruit, by replacing older electric choke tube light with LED tube light saving per year is about 2.5lakhs with return on investment of 11 months.
7. As a low hang fruit, by replacing older T8 tube light with LED tube light saving per year is about 1.2 lakhs with return on investment of 16 months.
8. As a low hang fruit, by replacing older fan with super fan saving per year is about 13.54 lakhs with return on investment of 63 months.
9. Load distribution on three phase is very poor in mechanical block, which need immediate measures to prevent over heating of wires and three phase equipment failure.

Faculty Members Involved in Energy Audit:

1. Mr. R. Vignesh Kumar, Assistant Professor / MECH
2. Mr. R. Vijayakumar, Assistant Professor(SG) / MECH
3. Dr. S. Sankarakumar, Assistant Professor (SG)/ EEE
4. Mr. T. Sivakumar, Assistant Professor / EEE

Students Involved in Energy Audit:

1. K. Ganesh @ Ajeethkumar, IV Year MECH
2. M. Naveen Kumar, IV Year MECH
3. V. Sathish Kumar, IV Year MECH
4. P. Vinoth Kumar, IV Year MECH

1.0: INTRODUCTION

1.1 About TryCAE Industrial Engineering Pvt. Ltd.,

TryCAE is an engineering services company from Tiruchirappalli, Tamil Nadu, India. Majority of the company expertise domain lies in CFD Analysis, FEA Analysis, Design Automation, Equipment Design and Energy Audits. TryCAE is engaged in the projects like L&T Khargone, Rajasthan Atomic Power Plant and L&T Ghatampur. TryCAE also capable in Design Automation where the drawings will be generated based on the input. We are working with ISGEC for design automation. Notable CFD projects are with BrahMOS and AGNI missile components currently working on an underwater torpedo's. They had done physical modelling of ESP for NTPC Farakka 500 MW plant. Currently we are working on CFD analysis of FGD project for NTPC Kudgi and for KC Cottrell.

The company has been mentored by the industry experts like Dr. R. Vasudevan, Dr. V. Gopalakrishnan, Dr. C. Mani and Mr. K. Sakthi.

1.2 About National Engineering College, Kovilpatti (Autonomous Institution)

National Engineering College, Kovilpatti, Tamil Nadu offers a wide variety of high-quality education and training opportunities for every student, awarding qualifications through the highly reputed Anna University. The college offers seven undergraduate and six postgraduate programs in a wide range of disciplines and is approved by AICTE and accredited by NAAC NEC is Sprawled in a lush green campus, with an alluring backdrop of an enchanting hillock, in NH44 between Madurai and Tirunelveli. The institute provides an excellent locale for academic pursuits in South Tamil Nadu.

1.3 ABOUT ENERGY AUDIT

The building sector has gained prominence over the past few decades as the largest consumers of energy. 45% of total global energy is used in heating, cooling and lighting of buildings. Energy consumption patterns could be substantially altered by adopting

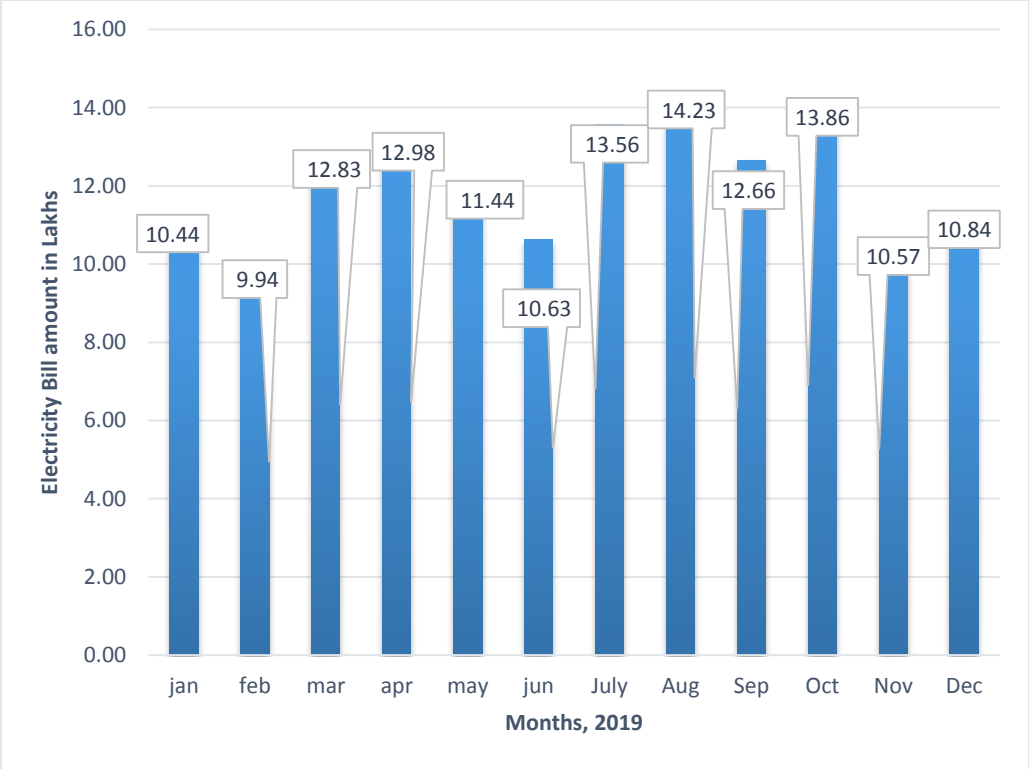
energy conserving measures, particularly during the phase of building design.Hence energy requirement to the building is need of the hour for the institutions, this might be the first step in achieving the green audit to the campus

2.0: ENERGY AUDIT

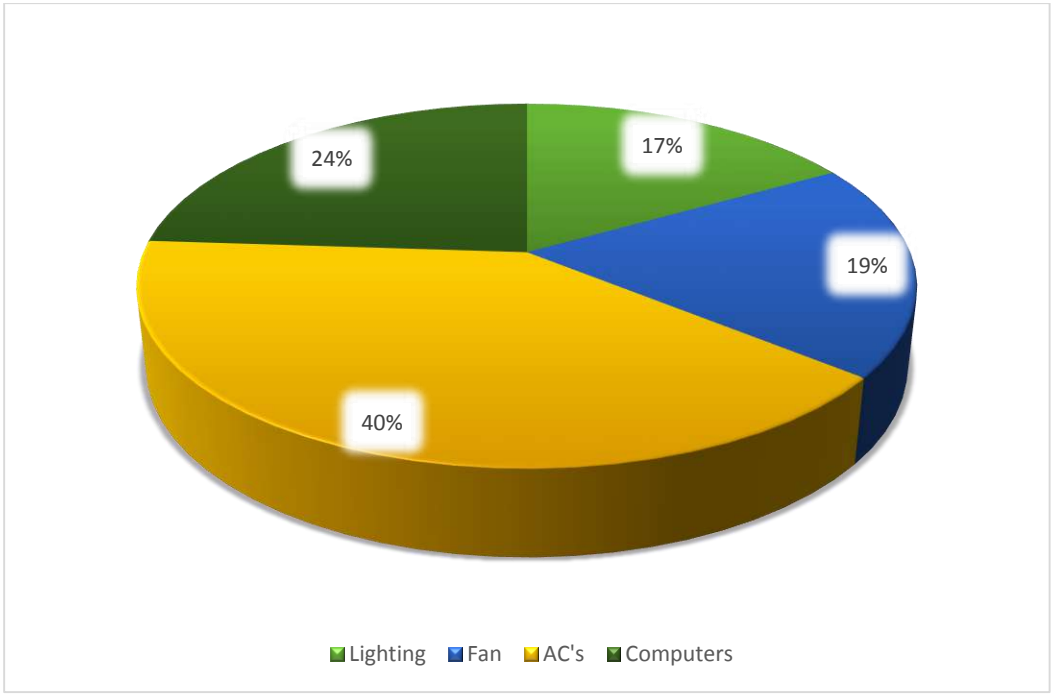
The area of the energy audit includes

- Class Rooms
- Faculty Room
- Laboratories
- Office Rooms
- Seminar Halls
- Hostels
- Canteen
- Auditorium
- Autonomous building
- others

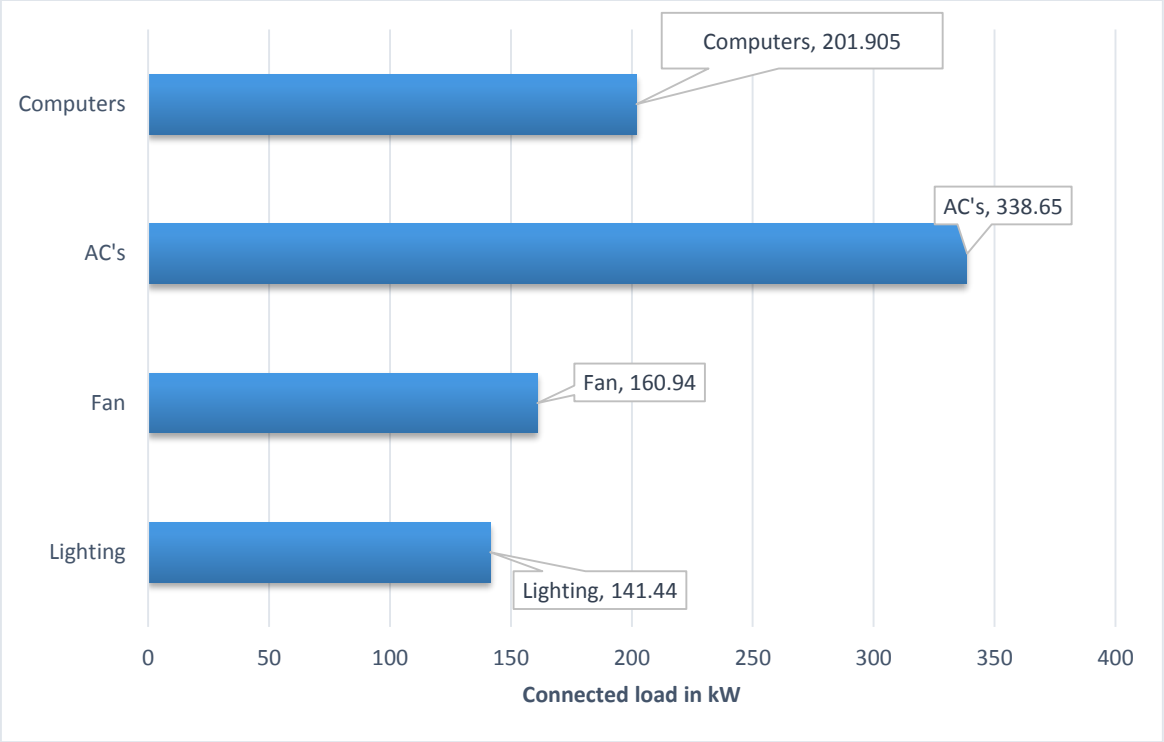
2.1 Power Consumption Pattern for the Year 2019



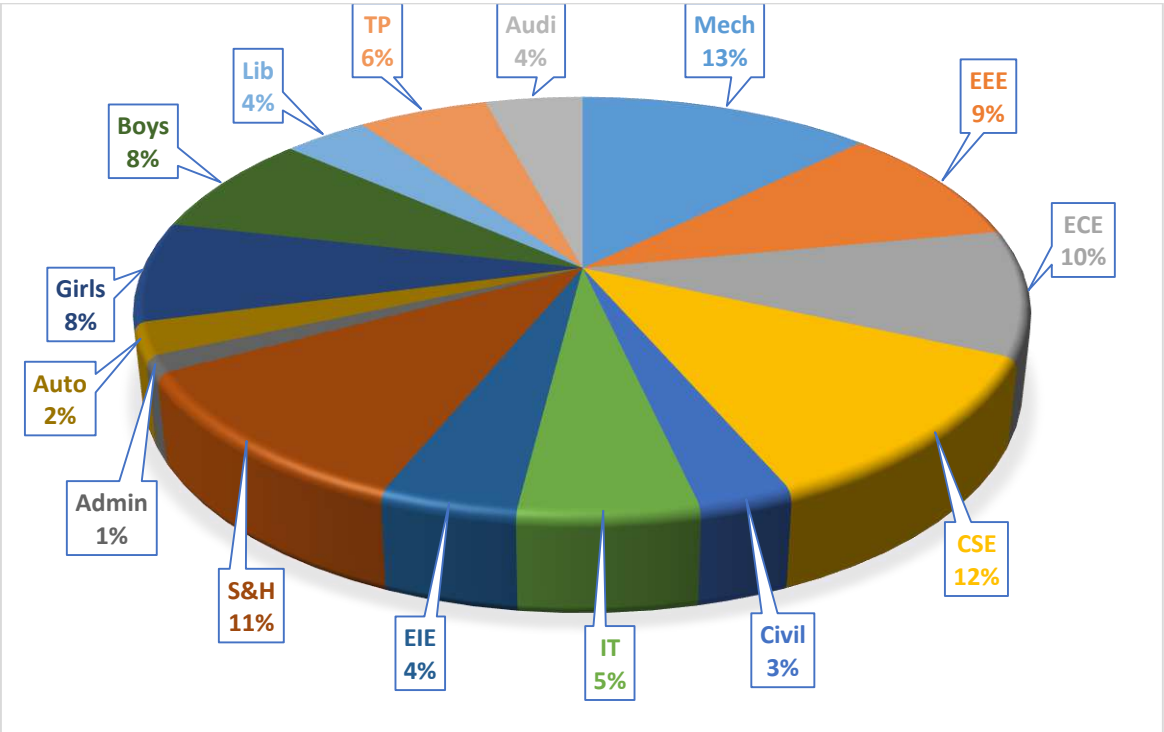
2.2 Connected load distribution of the NEC



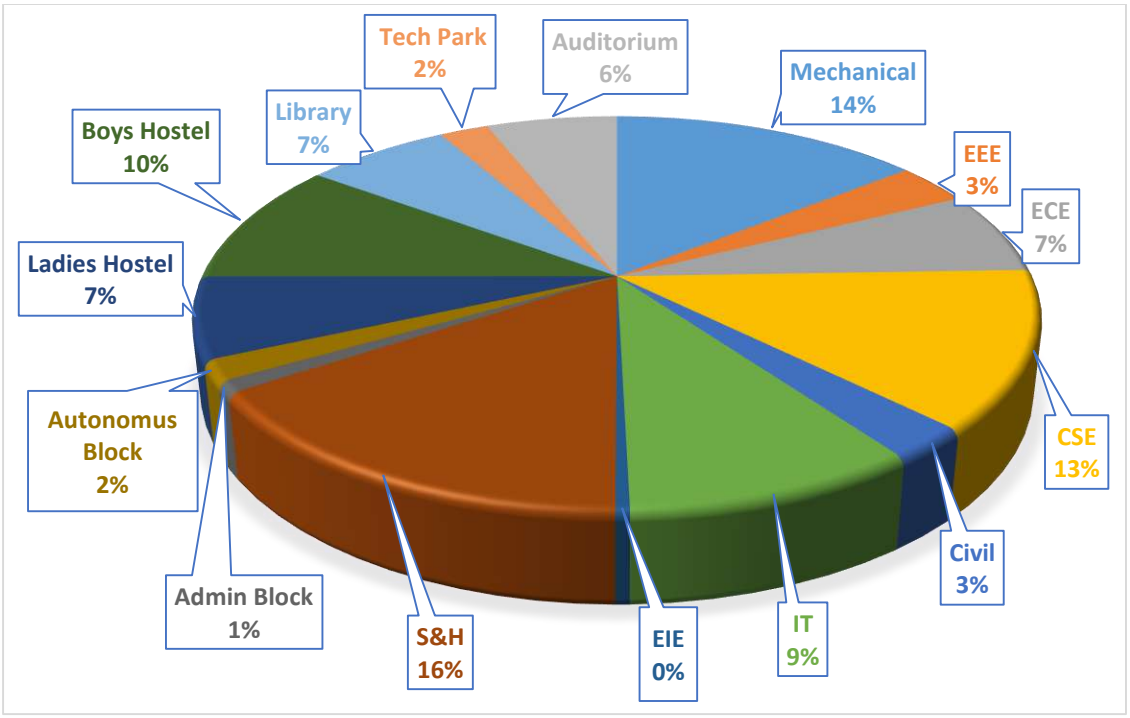
2.3 Connected kilowatt for different load distribution



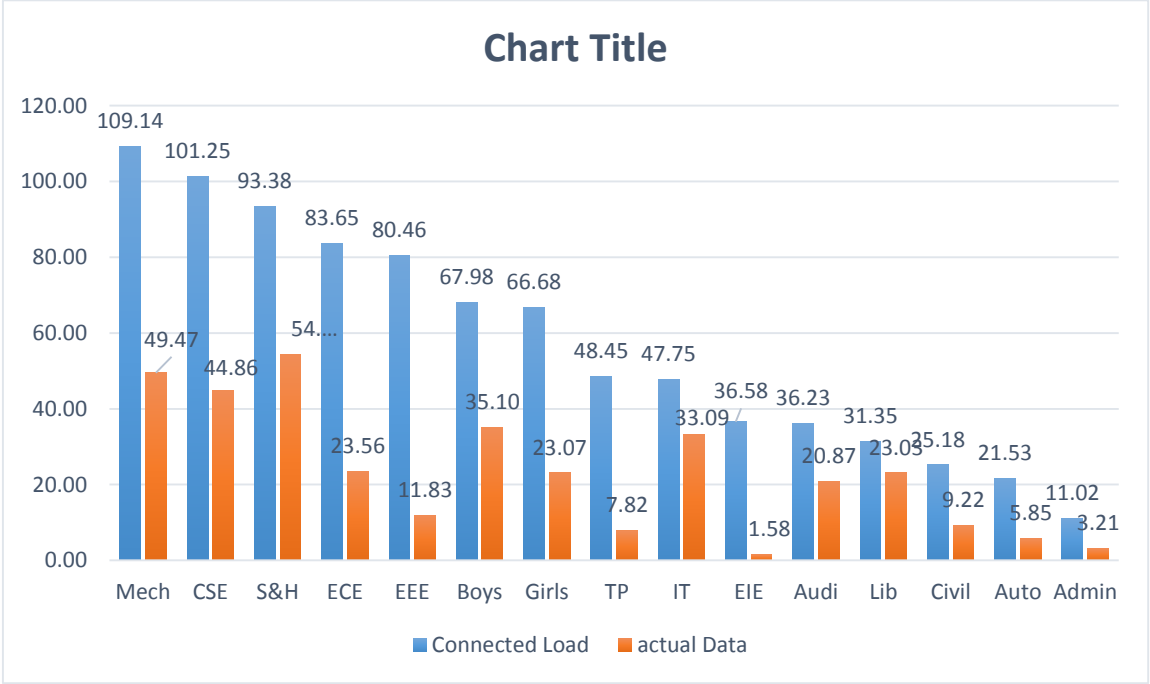
2.4 Percentage distribution for various buildings



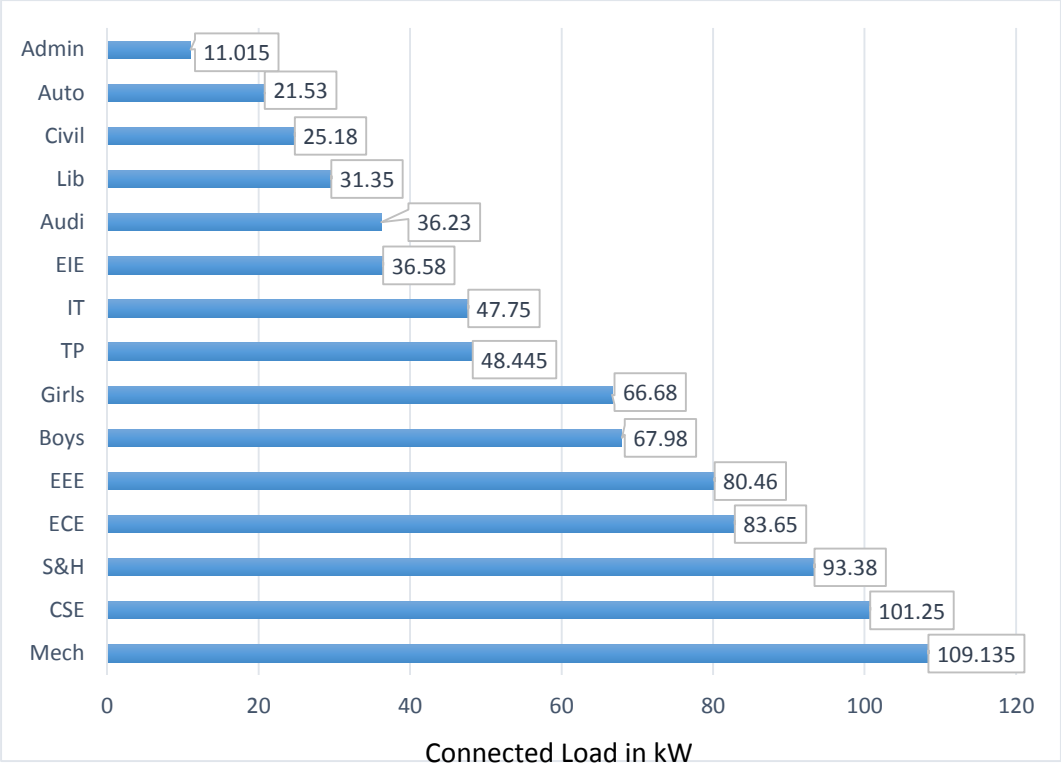
2.5 Percentage distribution for various buildings, recorded data from power quality



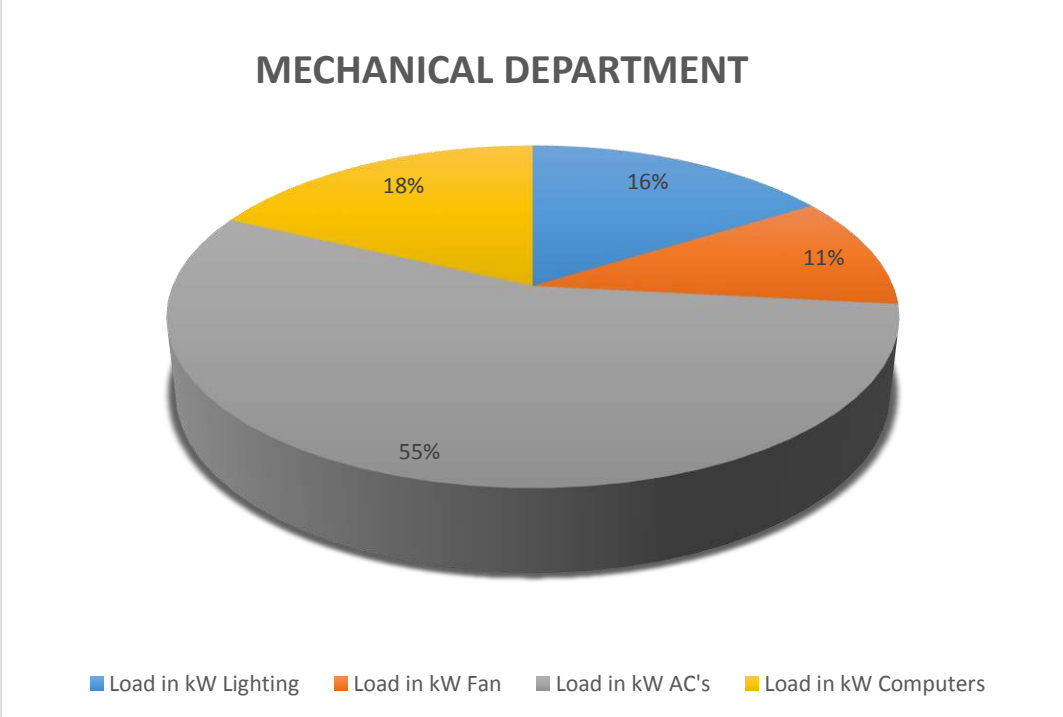
2.6 Comparison between connected load and actual recorded load



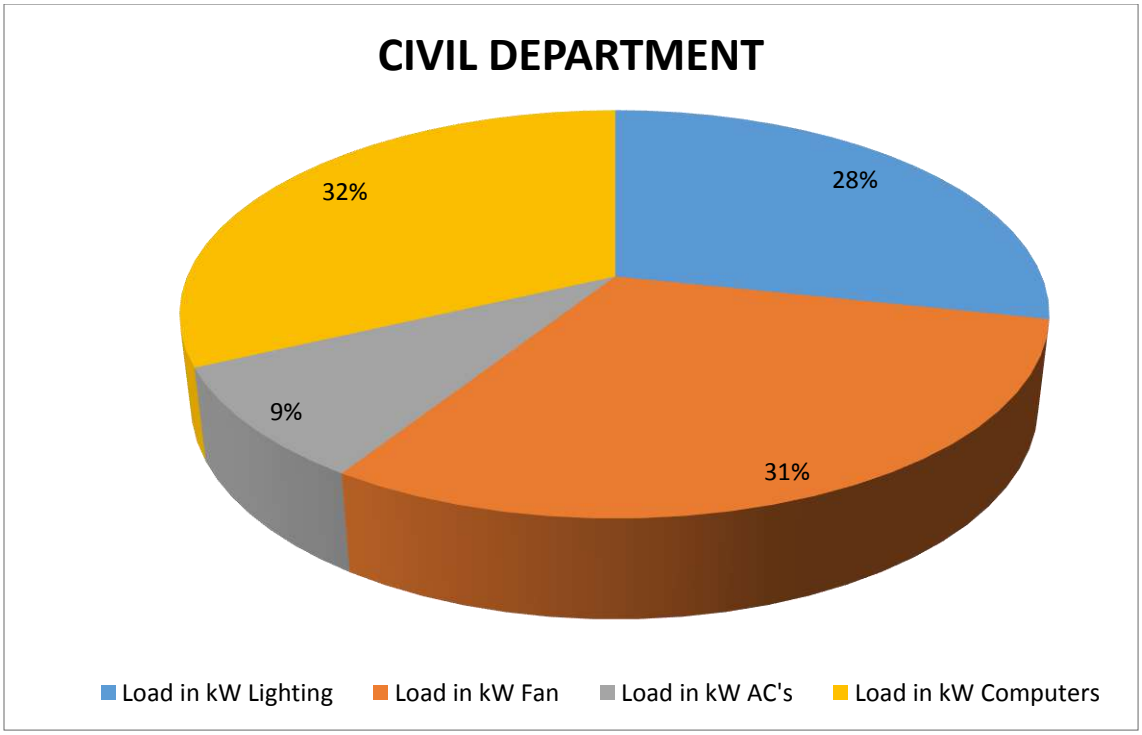
2.7 Power consumption based on connected load for various buildings



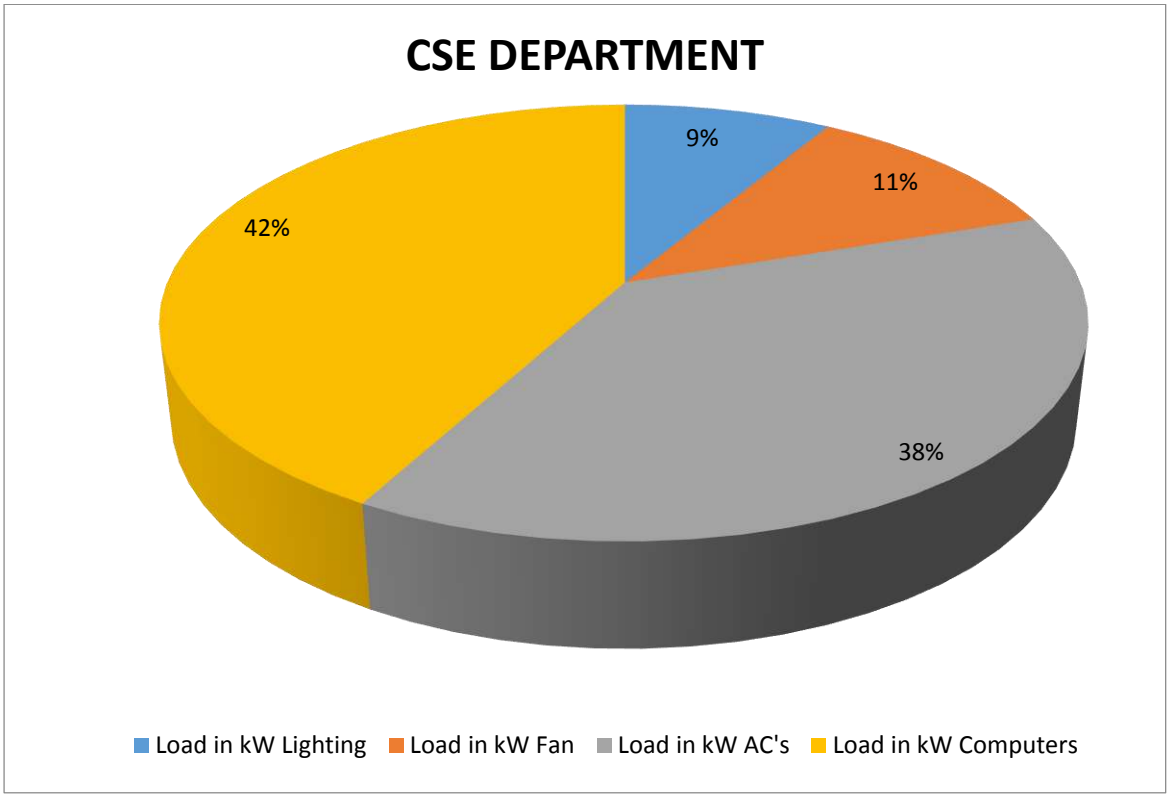
2.8 Connected load distribution for Mechanical Building



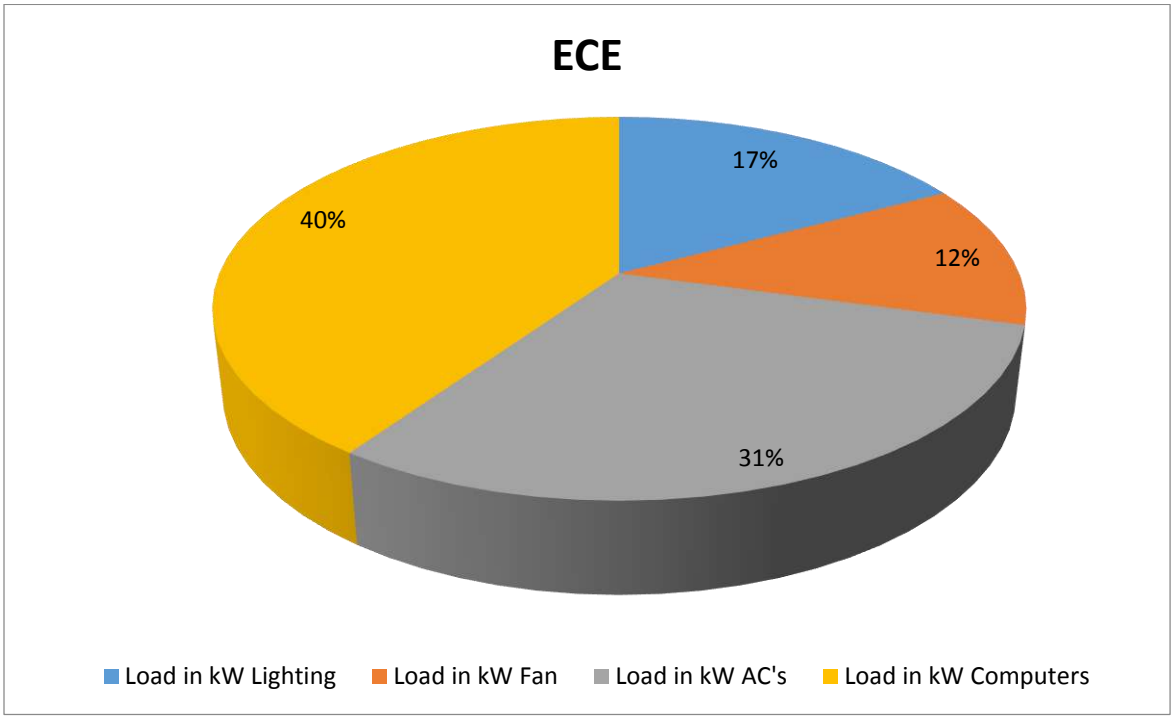
2.9 Connected load distribution for Civil Block



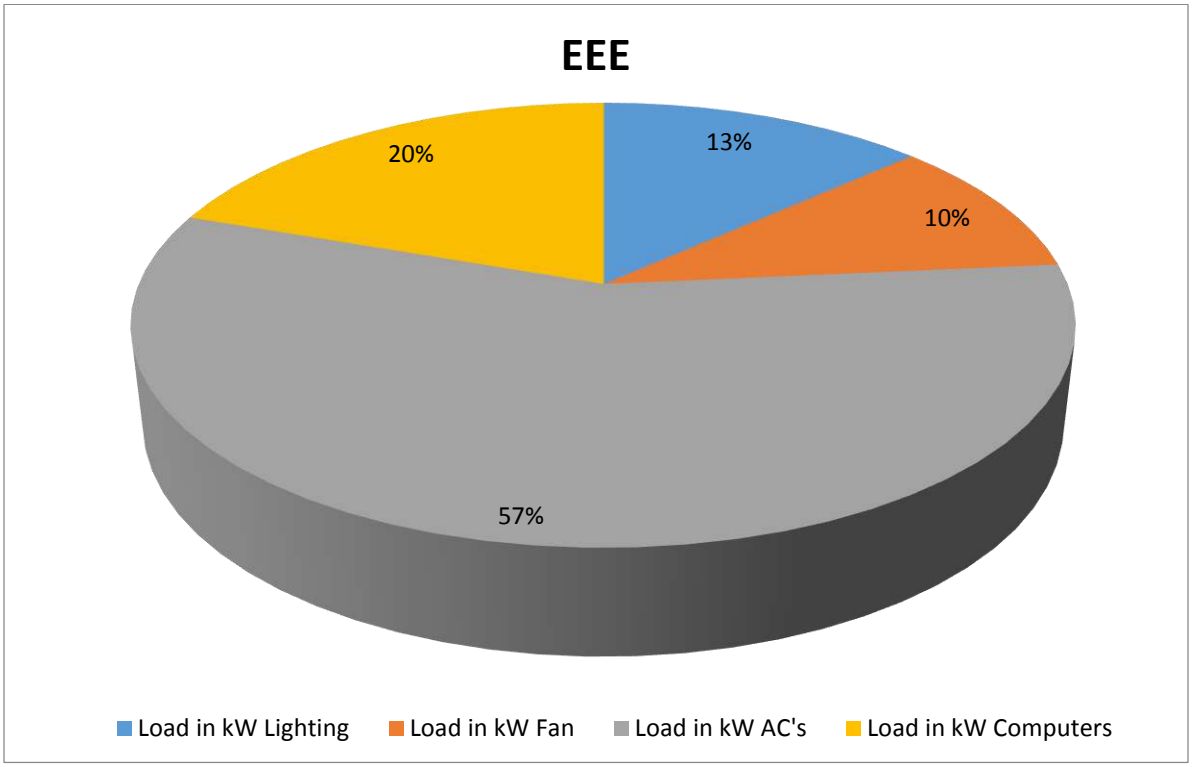
2.10 Connected load distribution for CSE Block



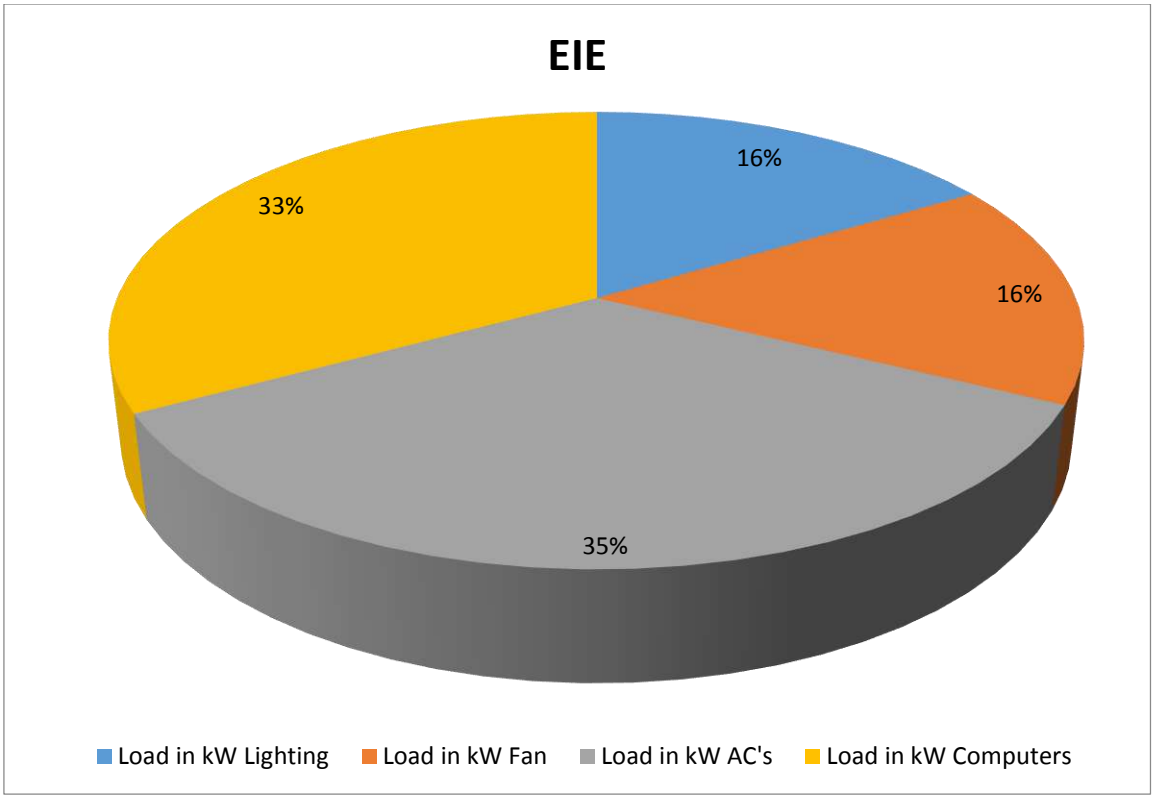
2.11 Connected load distribution for ECE Block



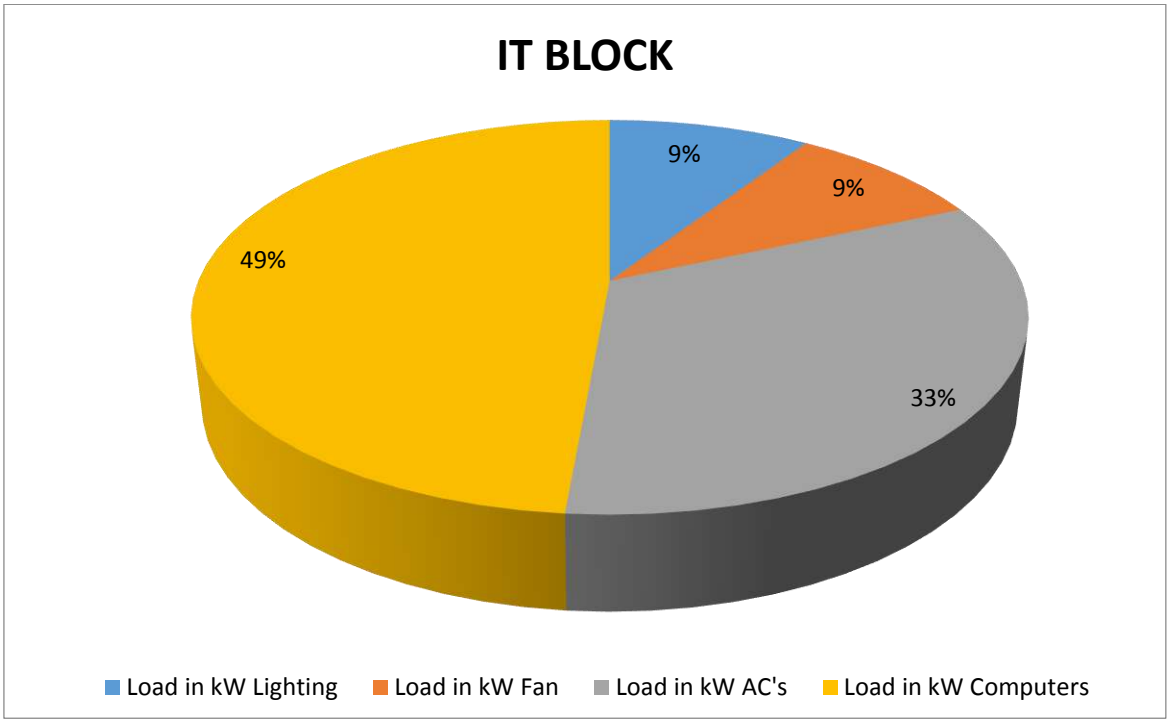
2.12 Connected load distribution for EEE Block



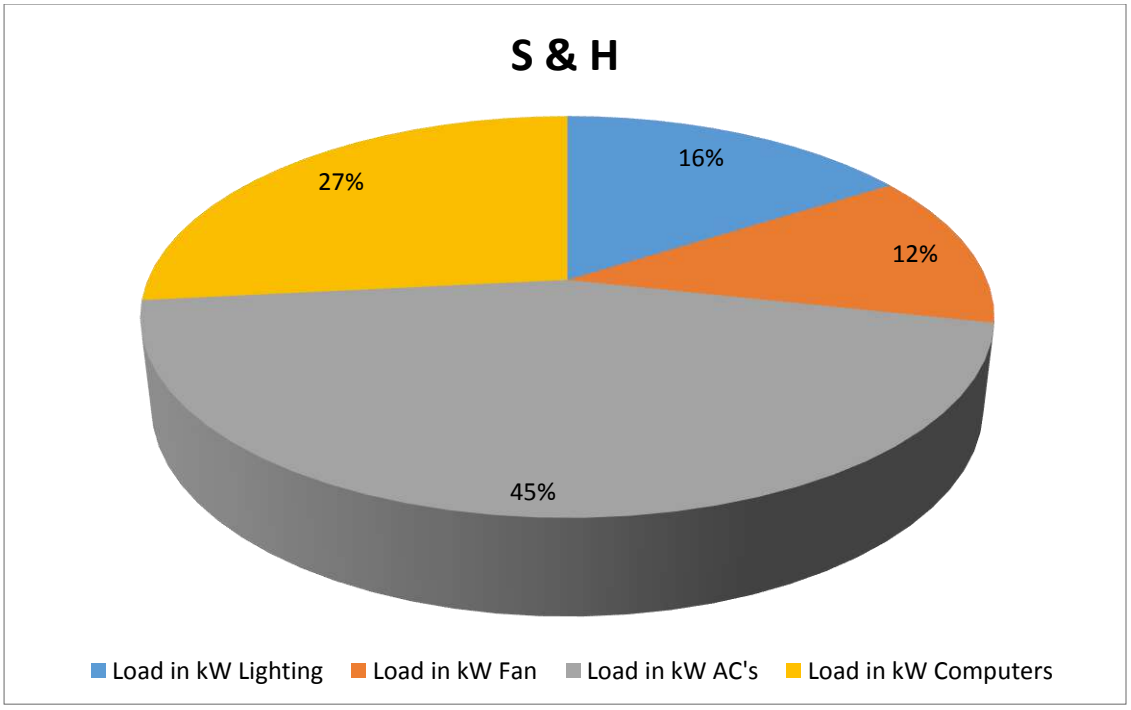
2.13 Connected load distribution for EIE BLOCK



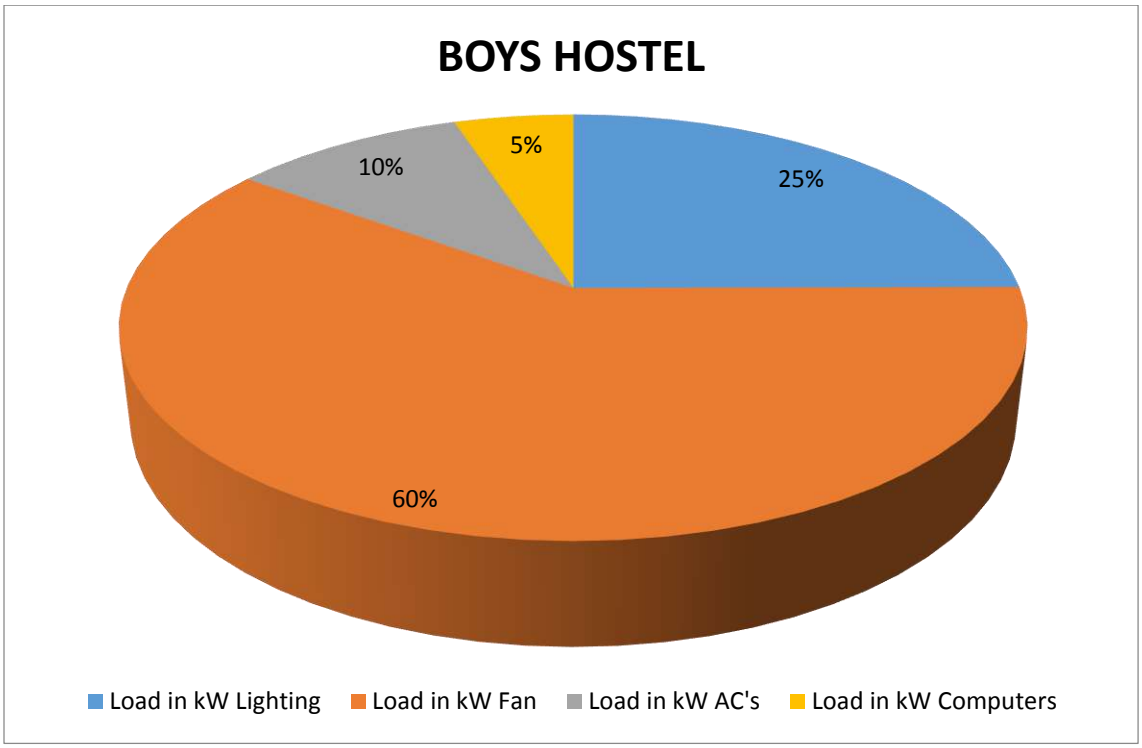
2.14 Connected load distribution for IT Block



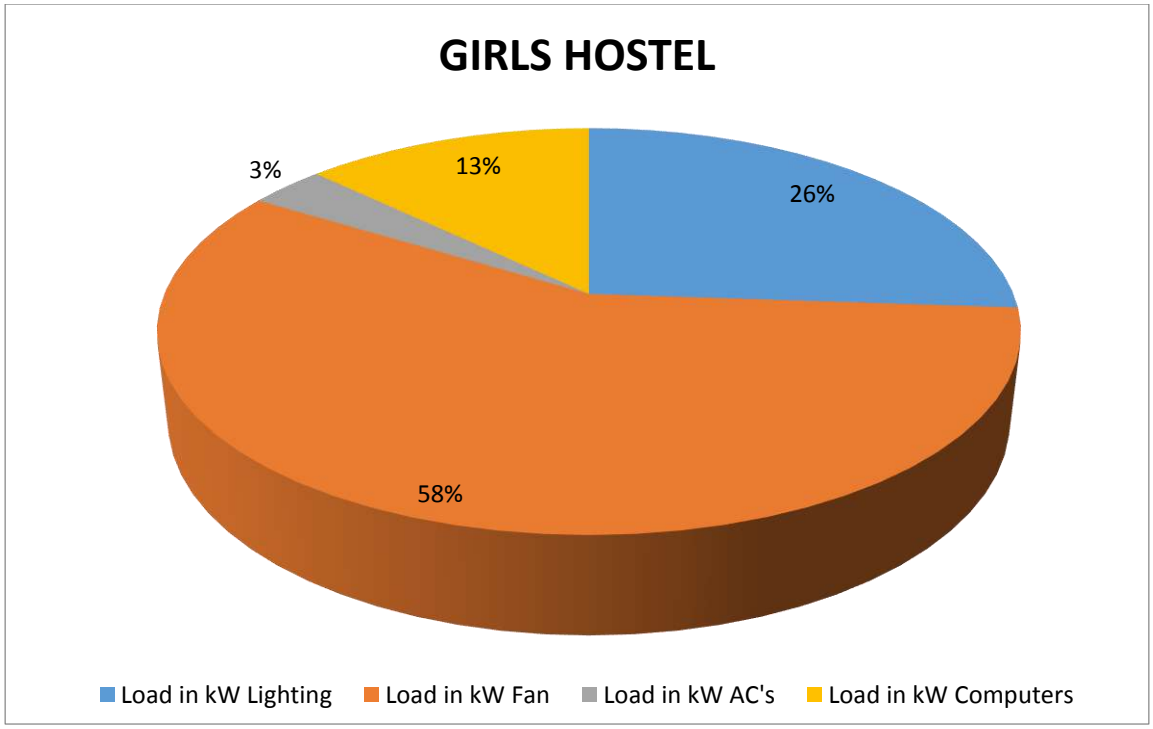
2.15 Connected load distribution for S & H Block



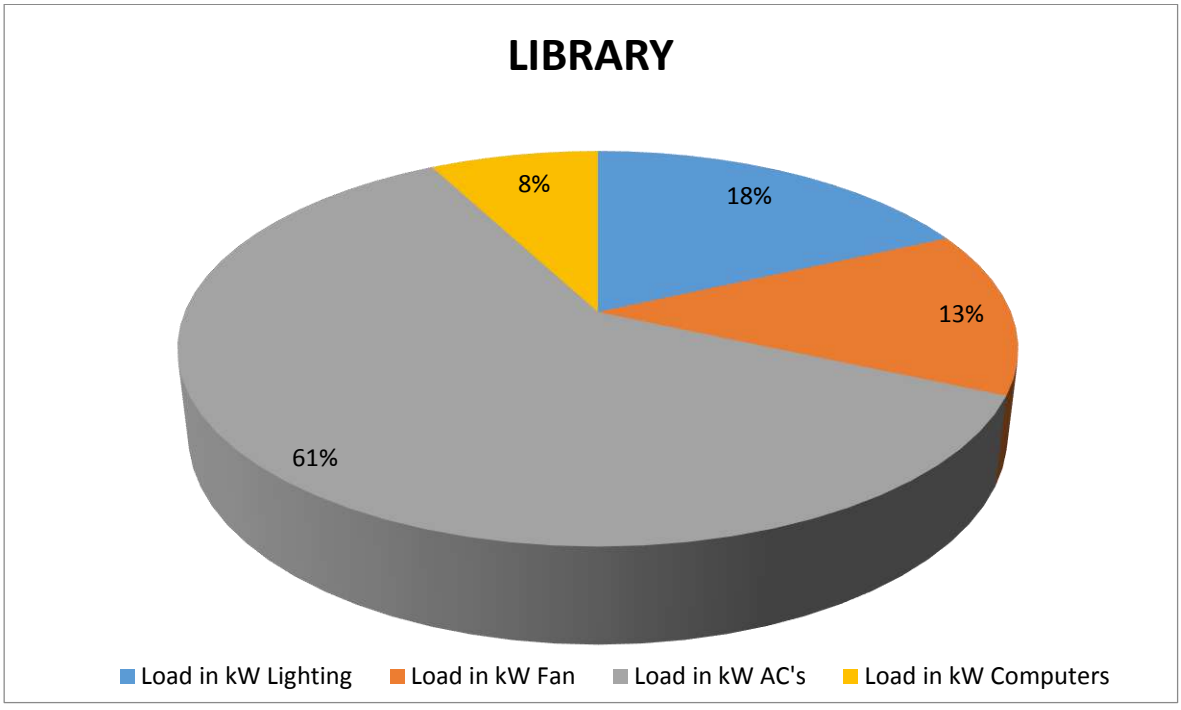
2.16 Connected load distribution for Boys Hostel:



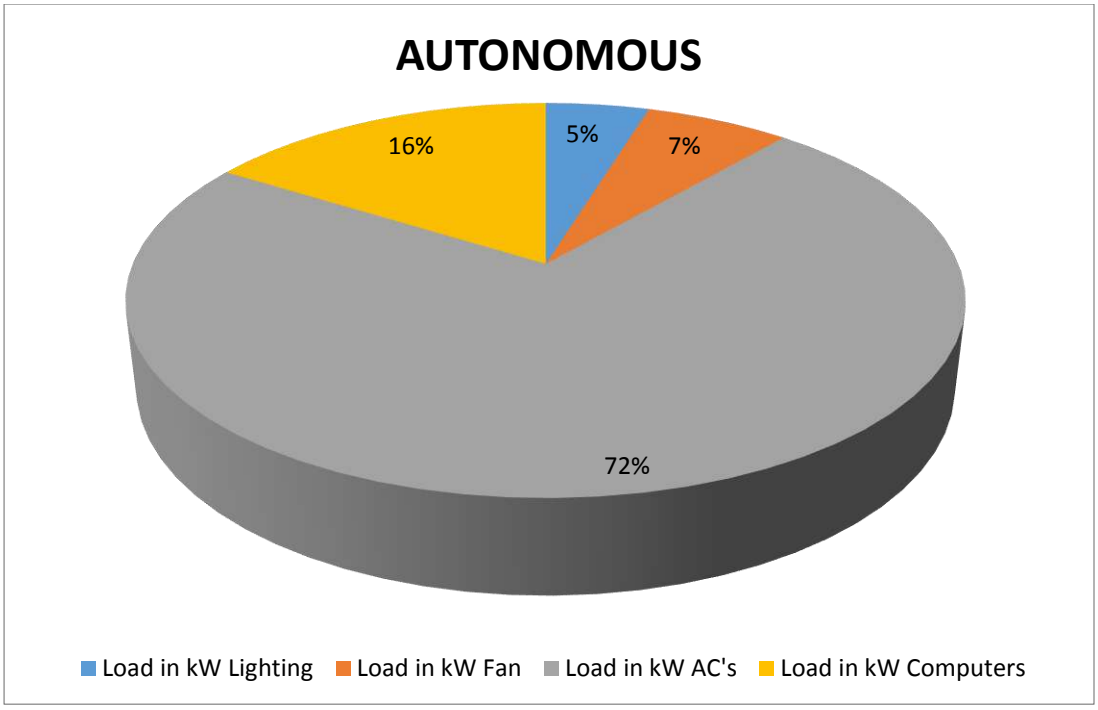
2.17 Connected load distribution for Girls Hostel:



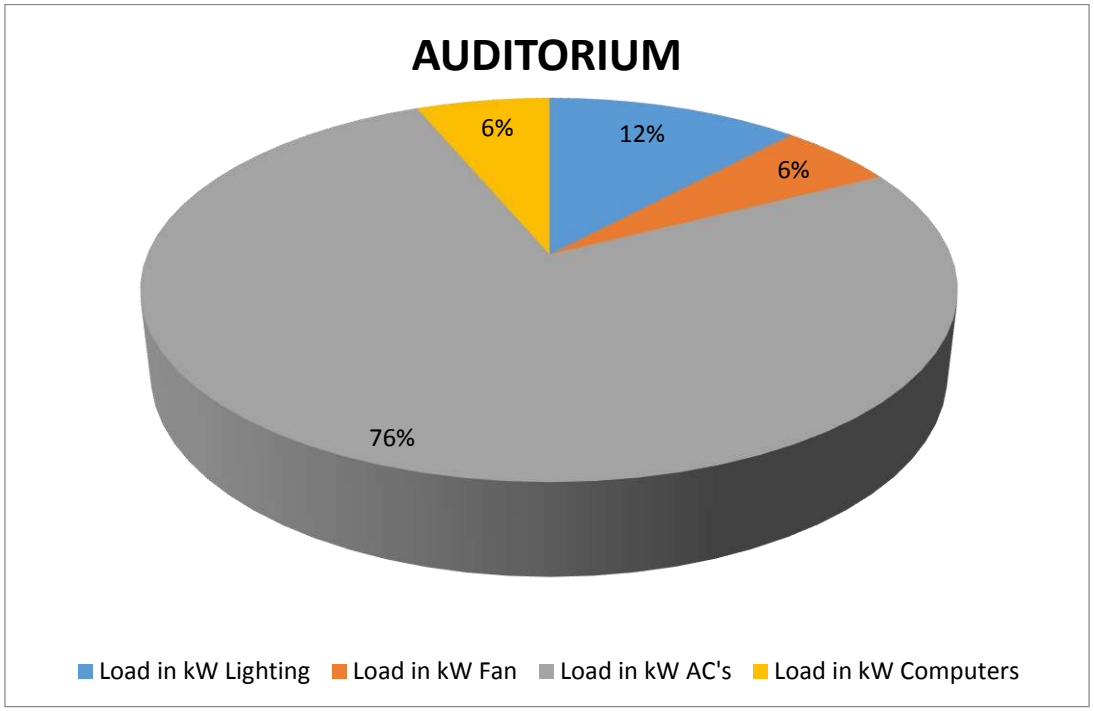
2.18 Connected load distribution for Library:



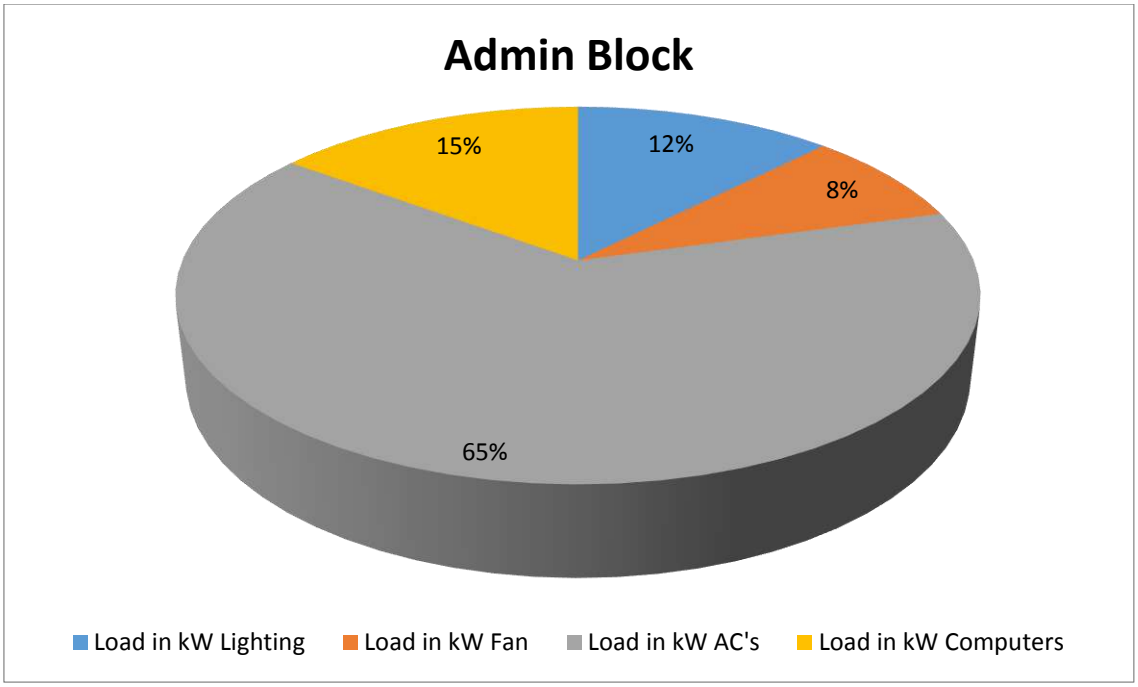
2.19 Connected load distribution for Autonomous Block:



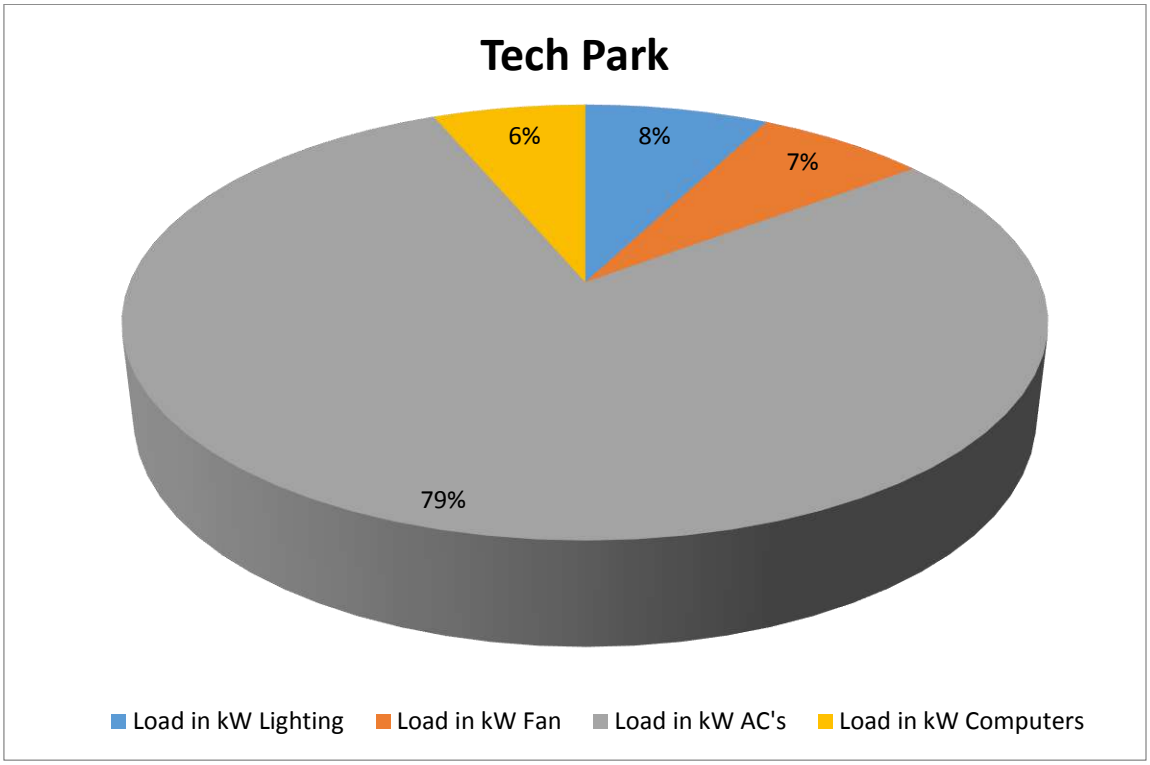
2.20 Connected load distribution for Auditorium:



2.21 Connected load distribution for Admin Block:



2.22 Connected load distribution for Tech Park:



2.23 Lux Value, Temperature and Relative Humidity of various buildings:

S.NO.	PLACES	Lux value with light	Lux value without light	TEMP	Relative Humidity
	Mechanical				
1	HALL NO1	227.5	154	34.8	48
2	ENERGY LAB	211.17	130.67	33.5	48
3	CARRIER CUIDENCE +1STAFF ROOM	310.17	212.3	34.3	39
4	CENTER FOR ENERGY STUDY	108	21.67	33.3	49
5	BATHROOM TOP-L	32	9.67	33.8	50
6	DEPARTMENT LIBRARY+2STAFF ROOM	128.83	88.33	33.8	48
7	DYNAMICS LAB+3STAFF ROOM	192	150.5	33.5	46
8	TOP SIDE (CORRIDER)	756.67	650.5	33.1	49
9	HYDRAULICS LAB+2STAFFROOM	31.7	15.2	36.8	45
10	STRENGTH OF MATERIAL+1STAFF ROOM	205.0	187.0	37.3	42
11	FOUNDRY LAB	113.2	104.0	36.8	37
12	SMITHY LAB	51.7	34.7	37.3	42
13	WELDING LAB	38.0	28.7	36.9	40
14	CARPENTRY LAB	57.2	31.3	36.5	42
15	STAFF ROOM 1	84.0	26.0	36.2	51
16	STAFF ROOM 2	32.0	9.7	36.5	42
17	WASTE PAPER ROOM	32.5	27.2	36.0	39
18	EXAMWING ROOM	94.5	24.8	34.2	45
19	R&D LAB	59.3	22.7	34.5	42
20	AUTOMATION LAB(L)	98.0	31.2	32.5	38
21	METROLOGY LAB	148.2	90.2	32.7	46
22	HOD ROOM	79.3	13.2	33.3	50
23	ADVANCE COMPUTING LAB +1STAFF ROOM	130.3	1.0	29.5	36
24	CAD LAB+2STAFF ROOM	210.2	1.0	32.3	53
25	SMART CLASS ROOM	143.5	21.5	29.8	46
26	AUTOMATION LAB(RIGHT SIDE)	80.0	3.0	32.8	47
27	SEMINAR HALL	95.7	18.0	30.8	46
28	IYYA RAJA SIR ROOM	172.8	11.0	29.1	40
29	DEPT OF PHYSICAL EDU	174.8	121.5	37.7	44
30	IC ENGINE LAB	22.2	17.7	37.3	42
31	HMT	121.3	110.2	36.9	42

32	STEAM LAB	26.3	12.0	36.8	46
33	CDIO	94.5	24.8	35.5	45
34	MACHINE SHOP-1	117.7	77.8	34.6	44
35	MACHINE SHOP-2	169.7	139.5	35.4	44
36	TRANSPORT OFFICE	57.0	23.2	34.9	50
37	POWER ROOM RIGHT	37.0	18.0	34.6	44
	AUDITORIUM				
38	AUDITORIUM	176.7	13.5	29.0	61.0
39	GIRLS CAFÉ	159.8	64.2	29.0	60.0
40	BOYS CAFÉ	173.8	9.8	28.9	56.0
41	GIRLS REST ROOM	94.7	52.5	28.8	51.0
42	BALCONY	76.2	7.2	27.9	44.8
43	ALUMINI CHAMBER	175.2	7.5	27.6	62.5
44	BOYS REST ROOM	220.8	153.5	27.5	56.0
45	FINE ARTS CLUB	69.7	6.0	27.7	48.0
46	CORRIDER-GROUND	159.7	74.8	26.1	52.5
47	CORRIDER-1ST	165.8	40.0	29.0	61.0
	AUTONOMOUS BLOCK				
48	FIRST FLOOR	159.7	74.8	27.7	61.8
49	GROUND FLOOR	89.7	5.0	27.4	65.0
50	CEO OFFICE	91.0	19.7	28.9	56.0
	CIVIL				
51	STAFF ROOM1	56.8	22.7	31.03	53
52	LECTURE HALL 1	72.3	32.2	31.2	53
53	CONCRETE &HIGHWAY LAB	165.5	133.5	31.2	53
54	SOIL LAB	125.9	88.7	31.12	52.5
55	CAD LAB	130.5	7.4	31.29	52
56	SMART CLASS ROOM	47.0	7.8	30.6	49
57	SEMINAR HALL	163.5	33.0	30.36	49.5
58	ENVIRONMENTAL LAB	97.0	59.0	31.15	53.25
59	OFFICE ROOM	120.7	65.7	31.07	53.75
60	DEPARTMENT LIBRARY	148.8	102.8	31.43	50
61	SURVEY LAB	110.5	80.8	31.35	51.75
62	TOILET BOYS	140.0	91.0	30.59	50
63	STORE ROOM	237.5	174.3	30.53	49.75
64	CORRIDER-UP	1174.8	745.8	30.73	49
65	TOILET GIRLS	71.0	44.5	30	73
66	HOD ROOM(V GUARD-VG501)	145.2	35.0	30.08	50.5
	CSE				
67	LECTURE HALL-1	213.5	144.8	31.66	55
68	GENTS TOILET	136.2	44.7	31.55	55

69	GIRLS REST ROOM	40.0	9.5	31.94	60
70	DR.APJ COMPUTER LAB	79.0	7.8	26.03	38.4
71	DR.SIR CV RAMAN LAB	102.7	4.8	25.5	38
72	IBM-2(INTEGRATIVE COMPUTER LAB)	92.2	5.0	26.08	38.5
73	FUNDED PROJECT LAB	89.7	5.3	26.62	39.5
74	IBM-1	79.0	7.8	27.53	35
75	SENSOR LAB	59.3	7.3	32.55	53.25
76	DRDO FUNDED PROJECT LAB	66.3	60.0	31.39	45.75
77	HOD ROOM	114.0	5.0	30.16	63.75
78	REMOTE MONITORING MANAGEMENT & INFORMATION SECURITY	139.2	9.5	30.12	43.75
79	CISCO NETWORKING ACADEMY	82.2	11.2	30.49	43.25
80	ELECTIVE HALL-1	40.0	9.5	31.77	55
81	ADRIOT SOFTWARE ROOM	291.8	29.2	31.73	63
82	MULTI PURPOSE	135.8	31.8	31.46	57.5
83	SEMINAR HALL	295.3	5.3	31.78	59.5
84	DEPT LIBRARY	407.8	667.8	31.57	53.25
85	STAFF ROOM-1	118.3	9.7	29.86	43.25
86	CORRIDER GROUND	213.5	143.8	29.52	54.75
87	UPS ROOM	128.3	49.7	31.57	53.25
	EEE				
88	HOD ROOM	213.5	144.8	31.66	70
89	RECORD ROOM	155.2	77.3	32	55
90	GIRLS TOILET-1	106.5	52.3	31.75	55
91	ELECTIVE HALL-1	127.2	65.5	31.75	55
92	PG CLASS	217.3	144.0	31.82	55
93	DEPT LIBRARY	159.8	102.2	31.8	55
94	CONTROL INSTRUMENT	197.0	130.3	26.08	60
95	ELECTRICAL WORKSHOP	240.2	99.3	25.5	60
96	HIGH VOLTAGE LAB	155.0	93.0	26.08	62.75
97	RESERCH LAB	95.0	30.7	31.39	45.75
98	SEMINAR HALL	152.0	22.0	30.44	63.75
99	COMPUTER LAB	201.5	5.5	30.63	62.5
100	LECTURE HALL-1	197.2	123.2	31.27	55
101	MICROPROCESSOR & CONTROL LAB	168.3	111.8	29.53	54.71
102	CORRIDOR GROUND	407.8	267.8	31.73	63
	EIE				
103	LECTURE HALL 20	88.3	45.5	31.49	47.5
104	STAFF ROOM	116.7	86.7	31.39	46

105	SEMINAR HALL	90.8	42.0	31.27	46
106	DEPARTMENT OFFICE	110.2	79.7	30.27	47.5
107	HOD ROOM	104.2	75.0	31.22	46
108	PROCESS CONTROL LAB	56.8	22.7	31.17	48.35
109	MEASURING INSTRUMENT LAB	169.5	33.0	27.78	70.25
110	DIGITAL ELECTRONICS LAB	165.5	133.5	29.83	62.5
111	ANALOG ELECTRONIC LAB	125.9	88.7	29.05	62
112	DEPARTMENT LIBRARY	148.8	102.8	29.8	62
113	TOILET-BOYS	40.3	23.2	31.4	46
114	TOILET-GIRLS	97.0	59.0	29.8	62
115	CORRIDER-DOWN	760.7	367.5	31.4	46
	IT				
116	OFFICE ROOM	48.8	1.8	29.45	71
117	HOD ROOM	275.3	119.3	28.53	59.5
118	PG LAB	80.3	9.7	28.63	56
119	R&D	237.5	174.3	28.28	57.25
120	CORRIDER-G	157.8	83.3	28.86	56
121	ELECTIVE HALL	306.2	190.5	28.98	56
122	STAFF ROOM-1	90.5	50.7	30.68	62
123	SEMINAR HALL	97.2	23.2	31.44	60
124	COUNSELING ROOM	119.5	49.0	31.63	69
125	GENTS TOILET	54.3	46.2	36.74	64
126	UG-1	75.8	51.3	29.34	46
127	GIRLS TOILET	121.0	89.3	30.7	58
128	NEW GEN	97.8	53.3	28.89	60
	ECE				
129	HOD ROOM	93.5	5.8	30.26	63
130	DEPARTMENT OFFICE	95.0	7.8	30.9	47.75
131	ELECTRONICS LAB	142.5	90.2	30.79	62.25
132	INTEGRATED CIRCUIT LAB	244.3	160.8	30.36	63.5
133	PROJECT DEVELOPMENT DEMONSTRATION LAB	83.7	6.0	30.85	61.25
134	MICROPROCESSOR LAB	141.3	12.3	30.18	53
135	STAFF ROOM-1	159.7	74.8	30.28	52
136	TEST ENGINEERING LAB	176.7	13.5	29.52	42
137	DST FUNDED PROJECT WORKSHOP	159.8	64.2	30.09	62.25
138	EMBEDDED SYSTEM LAB	175.2	7.5	30.92	65
139	VLSI DESIGN LAB	69.7	6.0	29.93	63.5
140	LECTURE HALL-11	159.7	74.8	30.6	63.71
141	REST ROOM	165.8	40.0	26.83	60

142	SMART CLASS	134.0	50.0	29.58	62.25
143	PRODUCT DEVELOPMENT CENTRE	98.7	20.7	28.45	44.5
144	MICROWAVE/COMMUNICATION LAB	167.2	7.2	28.64	46
145	NECE-NANOLITHO TRAINING CENTRE	114.0	8.2	28.97	44
146	DEPARTMENT LIBRARY	284.2	170.2	27.68	44
147	DIGITAL SIGNAL PROCESSING	261.3	8.5	27.13	37.24
148	GENTS TOILET	121.8	116.3	28.83	38.87
149	SEMINAR HALL	161.5	80.1	37.93	44
150	NETWORK LAB	112.2	8.0	28.78	61
151	CORRIDER GROUND	510.8	363.0	28.75	37.75
	S&H				
152	HOD ROOM	176.5	35.7	30.93	69
153	CHARLES BABBAGE LAB	141.8	5.8	29.33	53.5
154	LECTURE HALL-1	88.5	45.5	29.72	53
155	GIRLS TOILET-G	56.5	15.5	29.81	52
156	CORRIDER GROUND	157.8	73.3	29.07	57
157	SMART CLASS ROOM	97.2	23.2	30.03	67
158	CHEMISTRY RESERCH CENTRE	112.2	8.0	30.82	69.5
159	STAFF ROOM-G	152.6	15.0	29.55	77.25
160	CHEMISTRY LAB	85.8	11.5	29.83	74
161	GENTS REST ROOM	52.8	46.7	29.77	83
162	PHYSICS LAB	89.7	5.0	29.79	83
163	MATHS LAB	80.3	9.7	30.91	77.78
164	LIBRARY	142.2	55.5	29.92	74
165	ENGLISH LANGUAGE LAB	263.2	165.6	29.65	72.5
166	TRAINING PLACE MENT ROOM	78.7	40.5	29.83	75.35
167	DRAWING HALL	261.3	8.5	29.47	72.5
168	TRAINING HALL-1	162.8	63.0	29.57	70.25
	TECH PARK				
169	CORRIDER	95.0	7.8	28.96	60
170	COORDINATOR ED CELL	141.5	90.1	28.87	56
171	IDEATION LAB	182.2	9.8	28.83	51
172	HALL-1	83.7	6.0	27.93	44.52
173	CREATION LAB	141.3	12.3	27.55	62.5
174	COORDINATOR NEW JEN	159.7	74.8	27.52	56
175	CSE TECHNOPATION CENTRE	165.8	46.0	27.66	48
176	COORDINATOR NEC	151.8	64.1	29.07	63
177	BUSSINESS INCUBATION	173.8	9.8	28.85	61
178	INSTITUTION INNOVATION CELL	76.1	7.1	27.9	53.75

179	CHIEF EXECUTIVE CONSULTANT	175.2	7.5	28.95	61
180	GENTS TOILET	220.8	92.2	29.08	61
181	DEPARTMENT LIBRARY	156.2	74.8	21.88	61
182	TOILET LADIES	165.8	40.0	29.08	61
183	OFFICE(DEAN)	230.9	141.0	29.22	61
184	TRAINING HALL-1	116.7	40.2	29.33	61
185	GROUP DISCUSSION ROOM	98.7	20.7	29.13	60.5
186	SEMINAR HALL	167.2	7.2	29.1	63
	ADMIN BLOCK				
187	RECEPTION	178.3	8.7	29.68	55.5
188	PRINCIPAL ROOM	95.0	7.8	28.85	59.65
189	CONFERENCE HALL	142.5	90.2	29.34	56
190	DIRECTOR HALL	173.8	9.8	28.66	58.25
191	PS OFFICE	87.7	6.0	29.46	53.5
192	ASSEMBLY HALL	141.3	12.3	27.55	63.5
193	GENTS TOILET	153.7	74.8	27.52	56
194	LADIES TOILET	161.8	40.0	27.66	48
	LIBRARY				
195	READING HALL(OFFICE)	89.7	5.0	29.79	83
196	STORE ROOM	80.3	9.7	30.91	77.78
197	REFERENCE SECTION	142.2	55.5	29.92	74
198	LIBRARIAN ROOM	263.2	165.6	29.65	72.5
199	STACKING ROOM-1	78.7	40.5	29.83	75.35
200	SERVER ROOM	261.3	8.5	29.47	72.5
201	READING HALL	284.2	170.2	27.68	44
202	BACK VOLUME SECTION	261.3	8.5	27.13	37.24
203	BOOK BANK	121.8	116.3	28.83	38.87
204	STACK AREA 2	161.5	80.1	37.93	44
205	GENERAL STUDIES REFERENCE SECTION	112.2	8.0	28.78	61
	BOYS HOSTEL-1				
206	HOSTEL-BOYS OFFICE	93.5	5.8	29.67	66
207	HOSTEL RECEPTION	95.0	7.8	28.96	60
208	BATHROOM-G	142.5	90.2	28.87	86
209	RESIDENT WARDEM	83.7	6.0	27.93	44.75
210	TUTOR ROOM	143.3	12.1	27.55	62.5
211	READING HALL	159.7	74.8	27.52	56
212	LIBRARY	165.8	40.0	27.66	48
213	VEGETERIAN CANTEEN	159.8	64.1	29.02	61
214	NON VEGETERIAN CANTEEN	177.8	9.8	28.85	55
215	GYM	94.7	82.5	29.52	60

216	STORE	76.3	7.2	27.93	53.75
217	ROOMNO-1	75.3	7.5	28.94	61
218	ROOMNO-101	78.7	40.5	29.56	61
219	ROOMNO-201	159.7	74.8	30.71	55
220	CORRIDER-G	3342.0	3117.5	30.24	60.25
	BOYS HOSTEL-2				
221	HOSTEL RECEPTION	31.7	15.2	36.8	45
222	VEGETERIAN CANTEEN	205.0	187.0	37.3	42
223	NON VEGETERIAN CANTEEN	113.2	104.0	36.8	37
224	POWER ROOM	51.7	34.7	37.3	42
225	STORE ROOM	38.0	28.7	36.9	40
226	RESIDENT WARDEN	57.2	31.3	36.5	42
227	RECREATION HALL	84.0	26.0	36.2	51
228	CORRIDER-GROUND	32.0	9.7	36.5	42
229	TOILET-GROUND	32.5	27.2	36.0	39
230	GROUND FLOOR ROOM NO-1	94.5	24.8	34.2	45
231	ROOM NO-101	59.3	22.7	34.5	42
232	1ST FLOOR ROOM NO-1	98.0	31.2	32.5	38
233	2ND FLOOR ROOM N0-1	148.2	90.2	32.7	46
	LADIES HOSTEL				
	GROUND FLOOR A-BLOCK				
234	BATHROOM 1	80.3	9.7	28.63	56
235	ROOM 1	237.5	174.3	28.28	57.25
236	INTERCOM	157.8	83.3	28.86	56
237	LAB	306.2	190.5	28.98	56
238	VARANDA	90.5	50.7	30.68	62
239	RESI. WADERN ROOM	97.2	23.2	31.44	60
240	HOSTEL OFFICE	119.5	49.0	31.63	69
241	POWER	54.3	46.2	36.74	64
242	DISPEN	75.8	51.3	29.34	46
	FIRST FLOOR A-BLOCK				
243	ROOM 19	121.0	89.3	30.7	58
244	STAFF ROOM	165.8	40.0	29.08	61
245	LIBRARY	230.9	141.0	29.22	61
	SECOND FLOOR A-BLOCK				
246	ROOM 39	94.5	24.8	34.2	45
	GROUND FLOOR B-BLOCK				
247	ROOM 1	165.8	46.0	27.66	48
248	BATHROOM	151.8	64.1	29.07	63
249	VARANDA	173.8	9.8	28.85	61
	FIRST FLOOR B- BLOCK				

250	ROOM 17	165.8	46.0	27.66	48
	SECOND FLOOR B- BLOCK				
251	ROOM 33	173.8	9.8	28.85	61
	GROUND FLOOR C- BLOCK				
252	ROOM 1	175.2	7.5	28.95	61
253	STAFF ROOM	151.8	64.1	29.07	63
254	BATHROOM	76.1	7.1	27.9	53.75
255	VARANDA	76.3	7.2	27.93	53.75
	FIRST FLOOR C- BLOCK				
256	ROOM 13	75.3	7.5	28.94	61
	SECOND FLOOR C- BLOCK				
257	ROOM 25	78.7	40.5	29.56	61
258	STAFF ROOM	159.7	74.8	30.71	55
	FIRST FLOOR D-BLOCK				
259	ROOM 1	85.8	11.5	29.83	74
260	TV HALL	52.8	46.7	29.77	83
261	RECREATION HALL	89.7	5.0	29.79	83
262	MODERNIZED GYM HALL	80.3	9.7	30.91	77.78
263	VARANDA	142.2	55.5	29.92	74
	SECOND FLOOR D-BLOCK				
264	ROOM 7	78.7	40.5	29.83	75.35
265	VARANDA 1	261.3	8.5	29.47	72.5
	GROUND FLOOR E-BLOCK				
266	WARDEN ROOM	263.2	165.6	29.65	72.5
267	GUEST ROOM	56.8	22.7	31.03	53
268	TV HALL	72.3	32.2	31.2	53
269	ROOM 4	165.5	133.5	31.2	53
270	BATHROOM 1	125.9	88.7	31.12	52.5
	FIRST FLOOR E-BLOCK				
271	ROOM 29	47.0	7.8	30.6	49
	SECOND FLOOR E-BLOCK				
272	ROOM 60	97.0	59.0	31.15	53.25

3.0 ENERGY CONSERVATION RECOMMENDATIONS

3.1 Summary of Recommendations

Sl. No.	Topic	Descriptions	Investment (Rs.)	Return on Investment	Page No.
1.	Replacing the T8 tube lights to a LED tube lights	• Older Double frame tube lights consumes 17% of total light load • LED tube lights are up to 50% more efficient • Replacement of T8 tube lights with LED Tube light (Savings= 60.24 Units per Day)	1.51 Lakhs	16 months	28
2.	Replacing the older electrical choke tube lights to a LED tube lights	• PHASE 1 : Replacement of Single Electrical Choke tube lights with LED Tube light (Savings= 160 Units per Day) • Older Single frame Electrical Choke tube lights consumes 25% of total light load • LED tube lights are up to 60% more efficient	2.23 Lakhs	9 months	29
3.	Replacement of older fans with Super fan Older fans can be given as **donation to govt. schools**.	There are around 2369 fans in the campus. it consumes 94% of the fan total consumption, Super fans are up to 50% more efficient • Replacement of older fans with super fan (Savings= 830 Units per Day)	72 Lakhs	55 Months	30

Sl. No.	Topic	Descriptions	Investment (Rs.)	Return on Investment	Page No.
4.	Alternate lighting scheme for Street Light	After 12:00 am to 6:00 am percentage utilization of the street light will be less. Hence it is proposed to install alternate lighting scheme, where ODD numbers (installed) lights will be switched off after 12 am.			
5.	Proximity sensor for varendas, corridors, porticos and wash rooms	Proximity sensor or alternate lighting scheme can be implemented to save energy			
6.	Inverter AC for new purchase	All new AC purchases are recommended with Inverter AC.			
7.	Day time savings in hostels	A Common MCB which control all the power input to the floor is to be provided by switching off the MCB. We might save power, if some of the students forget to switch off the fans or lights.			
8.	Power balance for phases for current loading scenario	Power or loading balance to be done for the current loading scenario. It will prevent the over heat of the wires. Kindly refer power quality graph section.			31-134

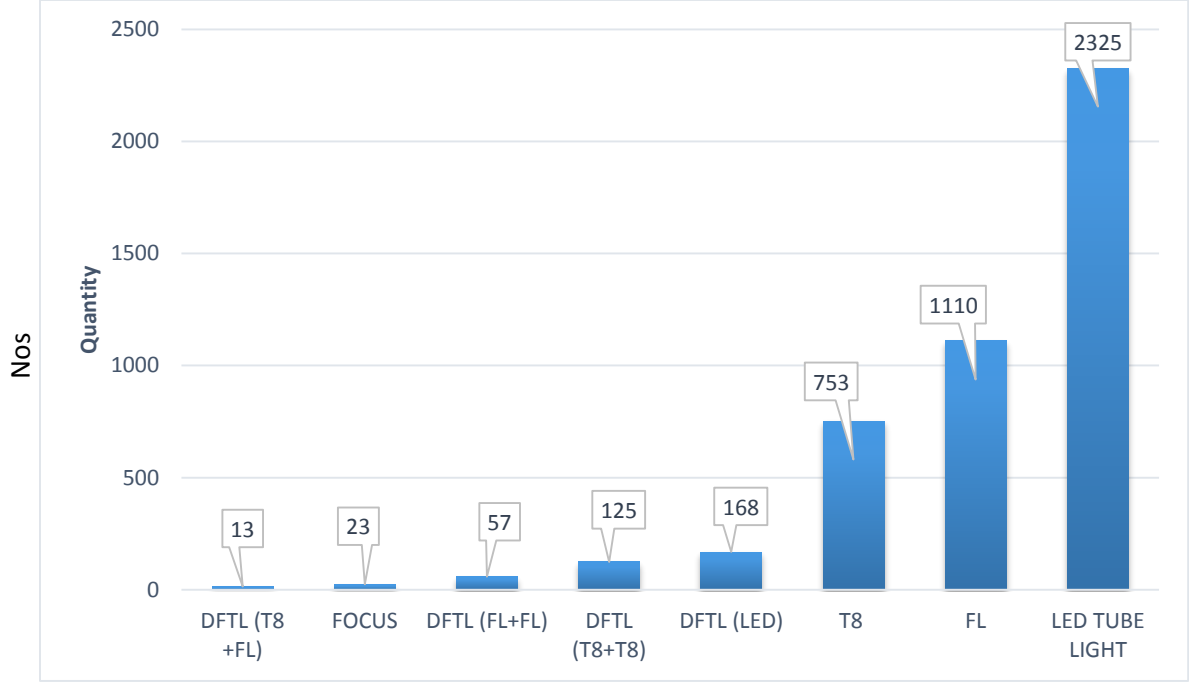
Sl. No.	Topic	Descriptions	Investment (Rs.)	Return on Investment	Page No.
9.	High volume low speed fan for Auditorium	A High volume low speed fan is recommended for the Auditorium.			
10.	Replacing smokeless stoves instead of LPG stoves	It would be energy efficient if smoke less stove is used.			
11.	Harmonic filter for neutral wire @ IT block, CSE block, EIE block, ECE block, boys and girls hostels.	Harmonics Values are found to be very high in circuit branch departments like IT, CSE, ECE & EIE. Since we are using LED tube lights in boys and girls hostels , THD is high in both hostels as well as it affects the overall power quality of NEC, Hence it is recommended to use harmonic filter at both hostels to avoid the future burning or overheat of neutral cables will be affected because of this high THD Refer Power Quality reports			31-134

4.0 ENERGY CONSERVATION PROPOSALS

The following table describes the total number of lights used in the NEC campus

Descriptions		wattage	Quantity	Power in kW
LIGHT	DOUBLE FITTED TUBE LIGHTS (T8 TUBE LIGHT+FLUORESCENT LAMB)	75	13	0.975
	DOUBLE FITTED TUBE LIGHTS (T8+T8)	60	125	7.5
	DOUBLE FITTED TUBE LIGHTS (FLUORESCENT LAMB)	90	57	5.13
	DDOUBLE FITTED LED TUBE LIGHTS	30	168	5.04
	LED TUBE LIGHT	15	2325	34.875
	T8 TUBE LIGHT	40	753	30.12
	FOCUS LIGHT	100	23	2.3
	FLUORESCENT	50	1110	55.5
FAN	SUPER FAN	35	117	4.095
	CROMPTON GREAVES FAN	65	2337	151.905
	ORIENTAL	65	32	2.08
	TABLE FAN	65	44	2.86
	REGULATOR	0	1029	0
AC	2 STAR	2600	23	59.8
	3 STAR	2250	101	227.25
	WINDOW AC	3000	15	45
	INVENTOR AC	2200	3	6.6
OTHER	TV	125	27	3.375
	Refrigerator	50	10	0.5
	PROJECTOR	150	33	4.95
Computers	HCL	150	105	15.75
	DELL	150	28	4.2
	Lenovo	150	31	4.65
	EVOLV	150	11	1.65
	SAMSUNG	150	12	1.8
	HP	150	71	10.65
	ACER	150	774	116.1
	switch (Internet)	150	166	24.9
	WIFI BOX	20	158	3.16

PRINTER	HP LASER JET M1213 NF MFP	100	26	2.6
	RICOH MP 2001sp	100	7	0.7
	HP DESIGN JET 500	100	9	0.9
	M1522N	100	14	1.4
	1020PLUS	100	8	0.8
	Scanner	100	9	0.9
	Toshiba	100	5	0.5
	Plotter	100	4	0.4
	Canon Xerox	100	8	0.8
OTHER	CHILLER	100	4	0.4
	MIXI	150	2	0.3
	CAMERA	30	9	0.27
	MICROWAV OWEN	250	1	0.25



4.1 Number of tube lights in the PMIST

From the above graph, LED tube light and Fluorescent lamp in the single frame are the major components in lighting load, followed by single electrical choke T8 tube lights.

A single LED tube light will consume only 20 W, whereas Fluorescent lamp and T8 will consume 50 W and 40W, a fluorescent lamp will consume two times more electricity than the LED tube light.

Hence it is recommended to replace the fluorescent lamp and T8 light with LED tube light in a phased schedule or in a single replacement.

Proposal 1

Replacing the T8 tube lights to a LED tube lights

WHY

- Older T8 tube lights consumes 17% of total light load
- LED tube lights are up to 50% more efficient

.

HOW

- Replacement of T8 tube lights with LED Tube light (Savings= 60.24 Units per Day)

COST

Investment	Payback Period
1.51 Lakhs	16 months

Return On Investment Calculations for Double Frame Tube Light

Total T8 Tube Lights	753	Nos.
Per Day Consumption	4	Hours
Watt of T8	40	
Per day Unit	120.48	Units
EB Rate Per Unit	6.35	Rs.
Total Amount Spend Per Day	765.048	Rs.
Per Month	19126.2	Rs.
Cost of New LED TL	200	Rs.
No of TLs	753	Nos.
Investment	150600	Rs.
Savings because of installation per day	382.52	Rs.
Return on Investment	393.70	Days
	15.748	Months

Proposal

2

Replacement of Electrical Choke Tube Light with LED tube lights

WHY

- Older Electrical Choke tube lights consumes 25% of total light load
- LED tube lights are up to 60% more efficient

.

HOW

- Replacement of Electrical Choke tube lights with LED Tube light (Savings= 133.2 Units per Day)

COST

Investment	Payback Period
2.22 lakhs	11 Months

Return On Investment Calculations for Electric Choke Tube Light

Total Tube Lights	1110	Nos
Per Day Consumption	4	Hours
Watt of Single TL	50	W
Per Day Unit	222	Units
EB Rate Per Unit	6.35	Rs.
Total Amount Spend Per Day	1409.7	Rs.
Per Month	35242.5	Rs.
Cost of New LED TL	200	Rs.
No of TLs	1110	Nos.
Investment	222000	Rs.
Savings because of installation per day	845.82	Rs.
Return on Investment	262.46	Days
	10.498	Months

Proposal 3

Replacement of older Fans with Super Fan

WHY

There are around 2369 fans in the campus in a recoiled condition, it consumes 94% of the fan total consumption. Super fans are up to 47% more efficient

HOW

- Replacement of older fans with super fan (Savings = 1539.85 Units per Day)

COST

Investment	Payback Period
71.5 lakhs	63 Months

Return On Investment Calculations for Super Fan

Total Older Fans	2369	Nos.
Per Day Consumption	10	Hours
Watt of Fan	65	W
Per Day Unit	1539.85	Units
EB Rate Per Unit	6.35	Rs.
Total Amount Spend per day	9778.048	Rs.
Per Month	244451.2	Rs.
Cost of New Super Fan	3000	Rs.
No. of Super Fan	2369	Nos.
Investment	7107000	Rs.
Savings because of installation per day	4512.945	Rs.
Return on Investment	1574.803	Days
	62.992	Months

MACHINE SHOP PANEL:

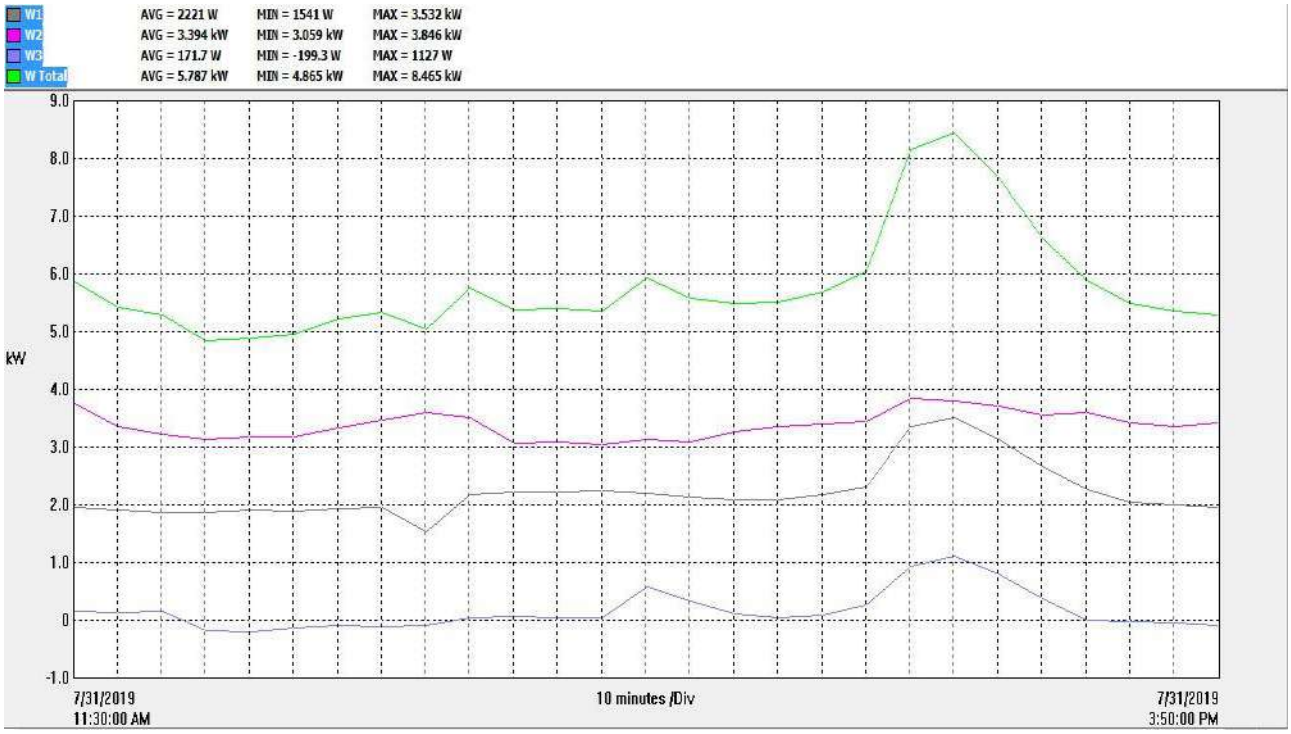


Fig.1 Shows the power (kW) for 4 hours from 31/7/2019 11.30AM to 31/7/2019 3.50PM

Inference: Power distribution is not balanced. Phase 2 is found to be Unbalance. It is loaded only 3% of the total.

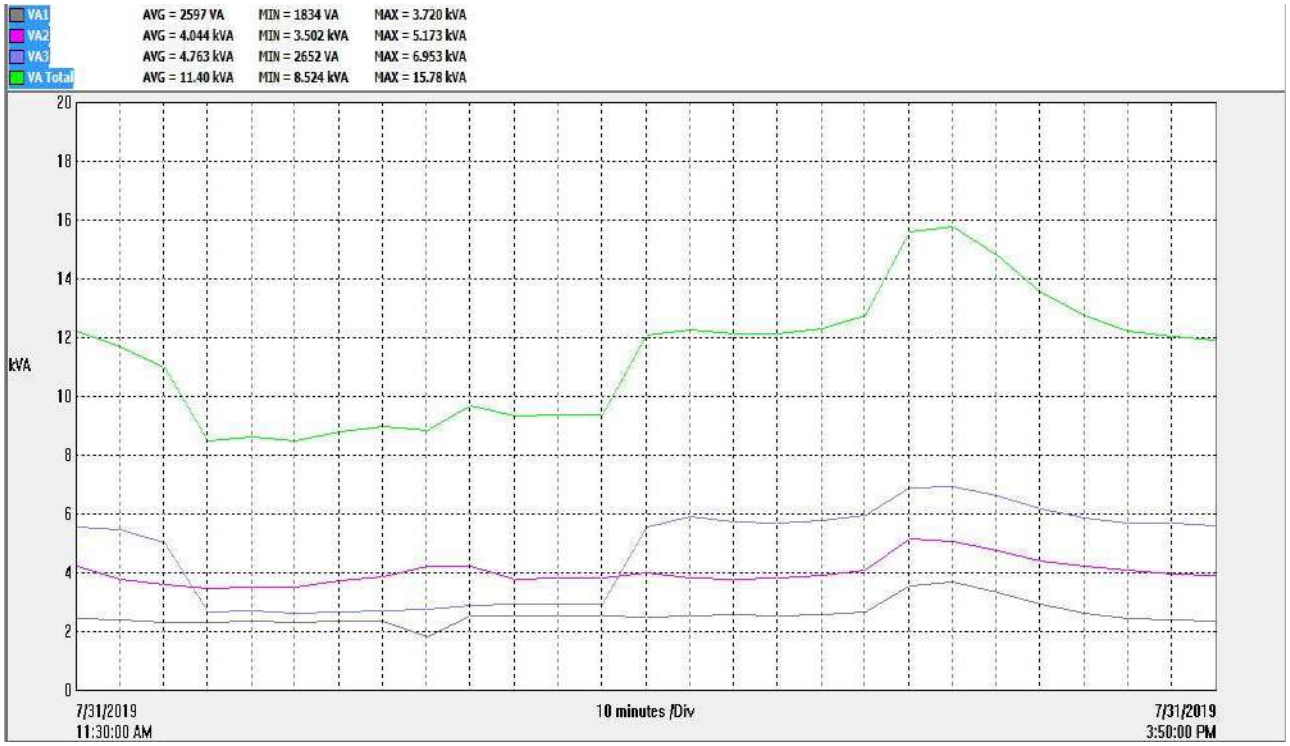


Fig.2 Shows the power (kVA) for 4 hours from 31/7/2019 11.30AM to 31/7/2019 3.50PM

Inference: Phase 3 shows higher kVA than other two phases.

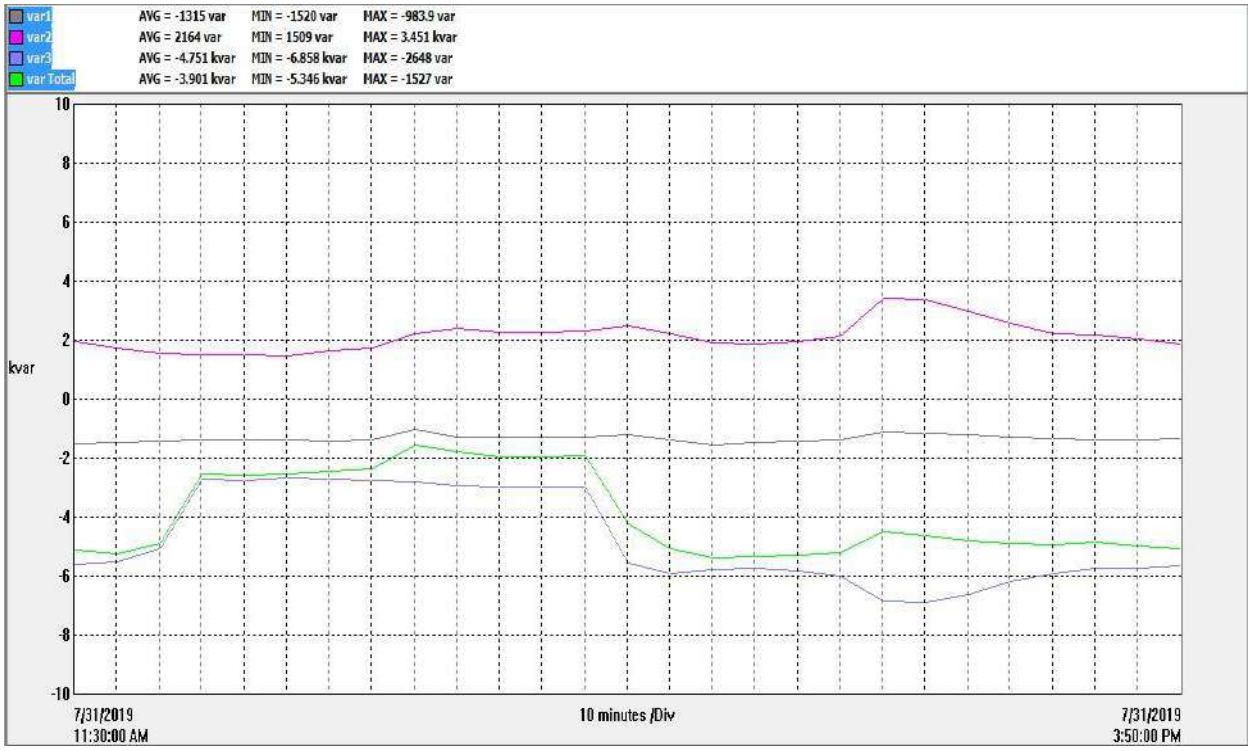


Fig.3 Shows the reactive power (kVAR) for 4 hours from 31/7/2019 11.30AM to 31/7/2019 3.50PM

Inference: Phase 3 shows abnormal condition.

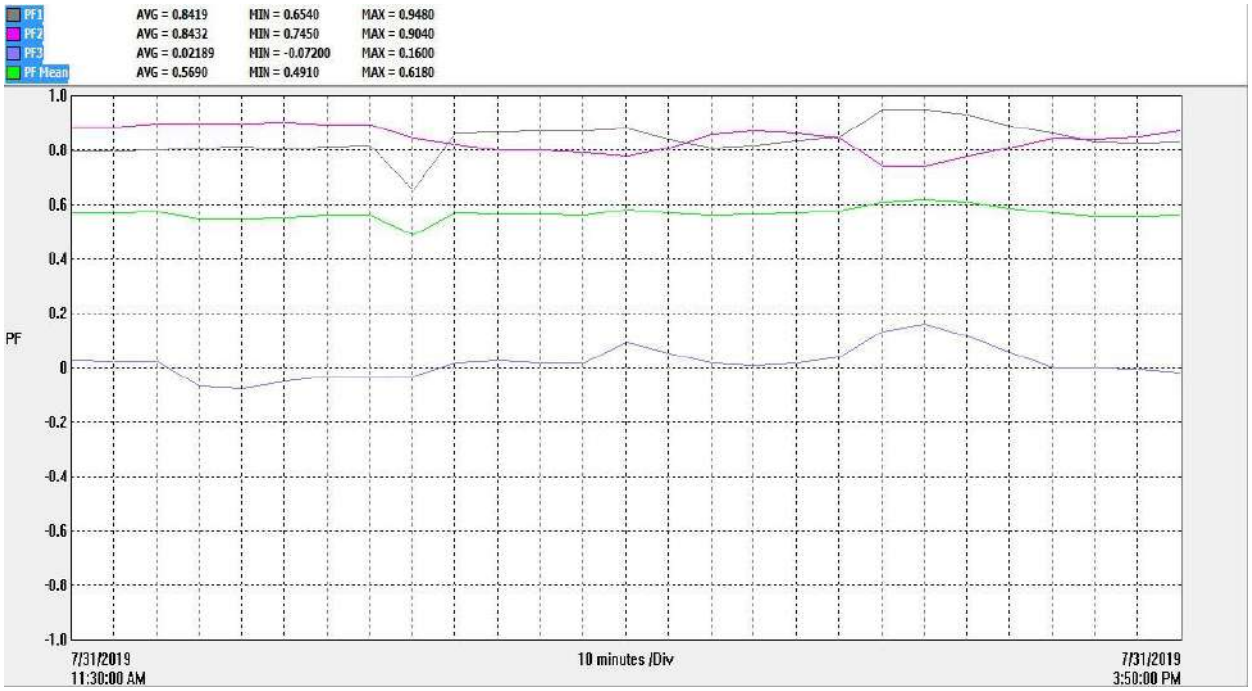


Fig.4 Shows the power factor (PF) for 4 hours from 31/7/2019 11.30AM to 31/7/2019 3.50PM

Inference: Phase 3 need to be check for its connection where kVA, KVAR is high and PF is very low.

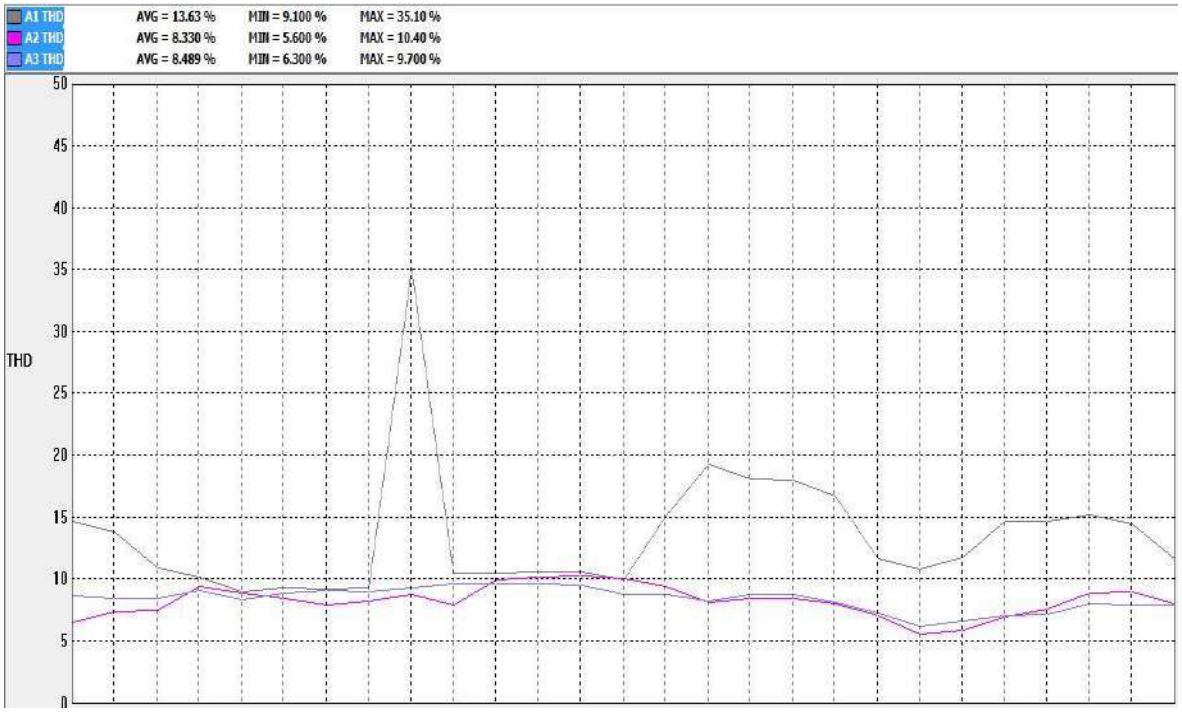


Fig.5 Shows the THD (Voltage Harmonic) for 4 hours from 31/7/2019 11.30AM to 31/7/2019 3.50PM

Inference: Harmonics seems to be normal. No need of harmonic filters.

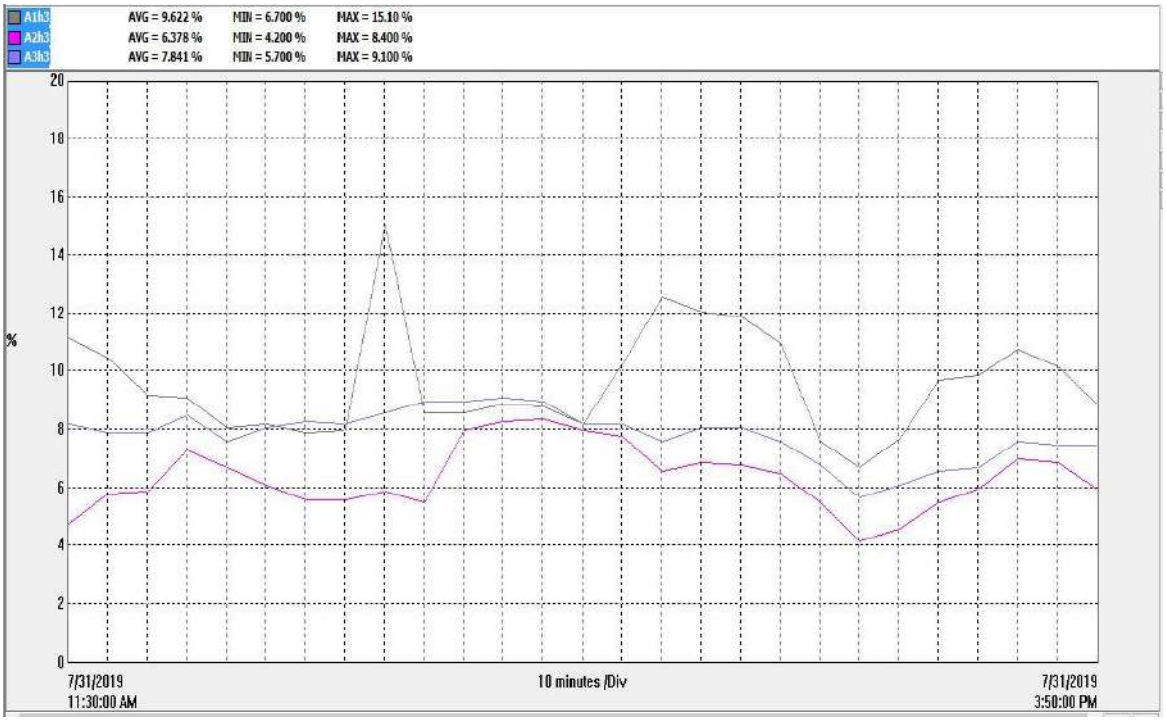


Fig.6 Shows the 3rd order THD (Voltage Harmonic) for 4 hours from 31/7/2019 11.30AM to 31/7/2019 3.50PM

Inference: Harmonics seems to be normal. No need of harmonic filters.

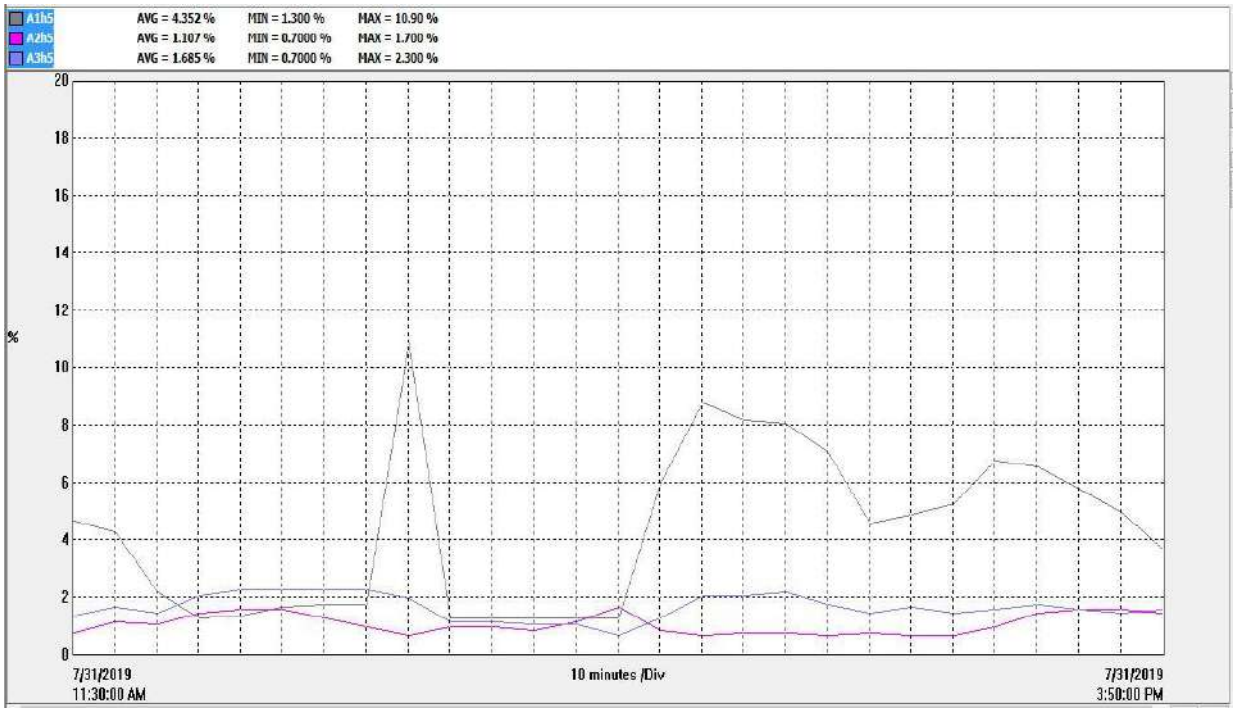


Fig.7 Shows the 5th order THD (Voltage Harmonic) for 4 hours from 31/7/2019 11.30AM to 31/7/2019 3.50PM

Inference: seems to be normal. No need of harmonic filters.

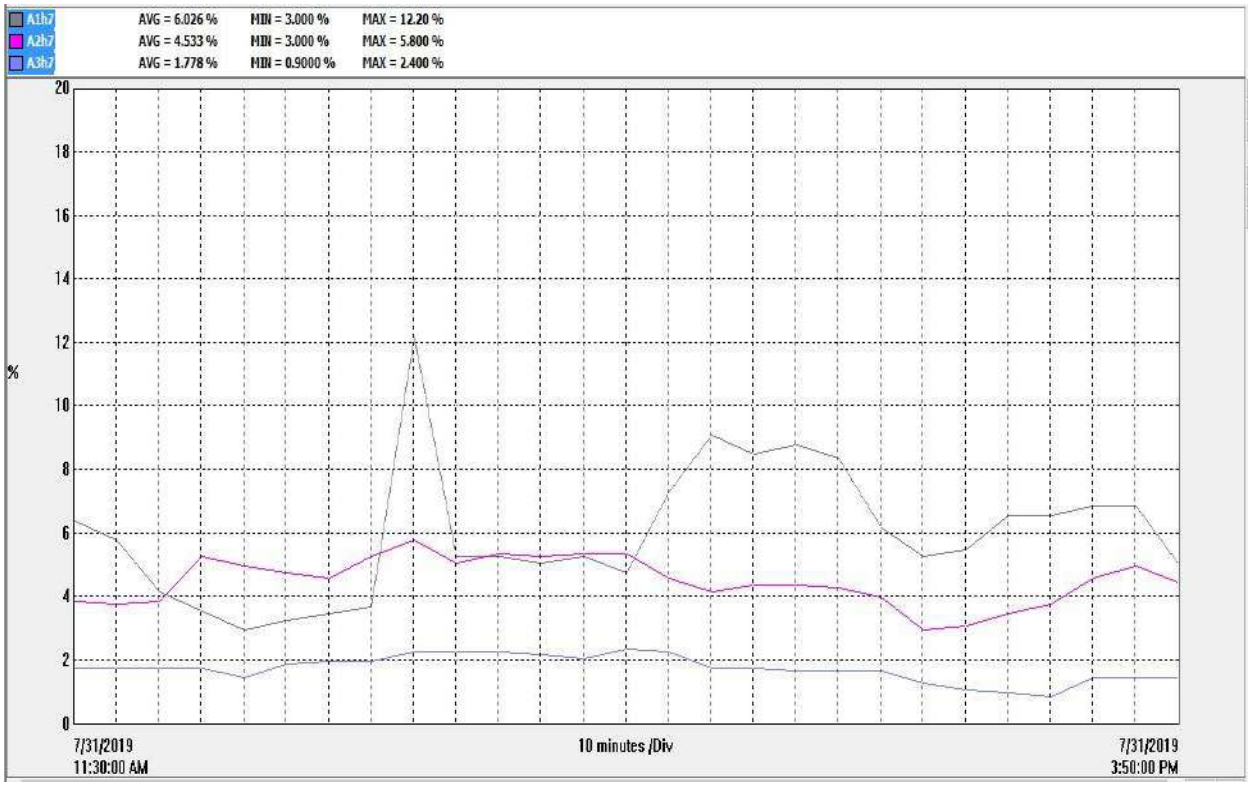


Fig.8 Shows the 7th order THD (Voltage Harmonic) for 4 hours from 31/7/2019 11.30AM to 31/7/2019 3.50PM

Inference: Harmonics seems to be normal. No need of harmonic filters.

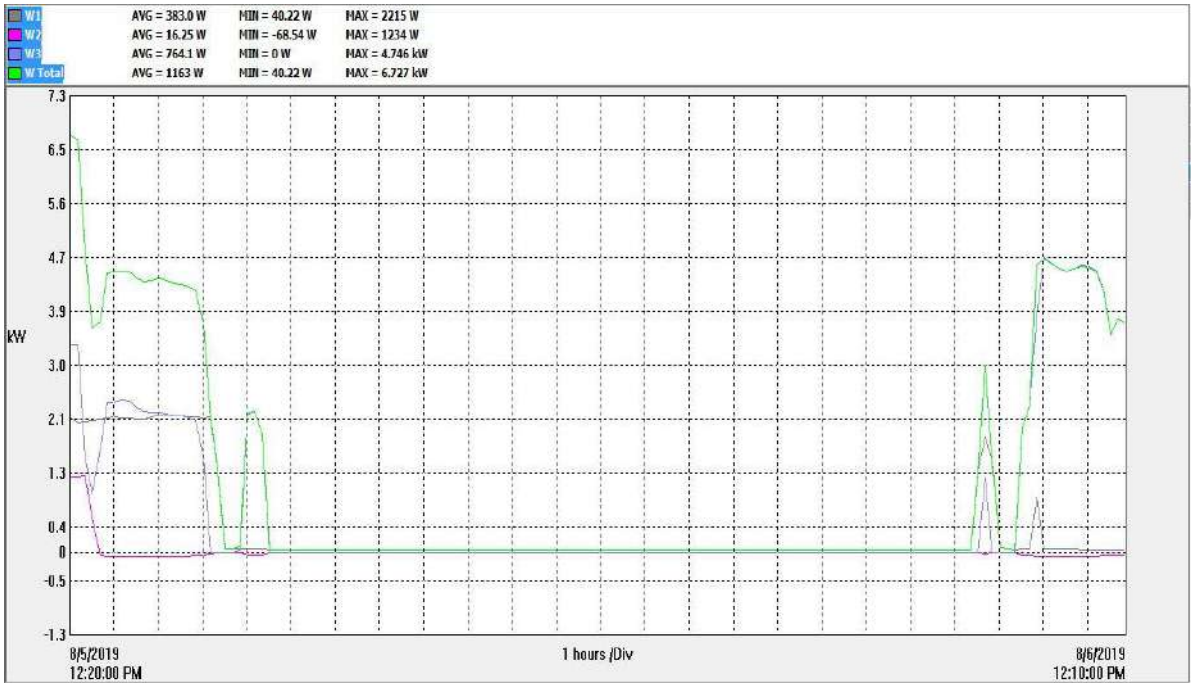


Fig.9 Shows the power (kW) for 24 hours from 5/8/2019 12.20PM to 6/8/2019 12.10PM
Inference: power distribution is not balanced. Phase 2 is found to be unbalanced and it loaded only 2% of the total.

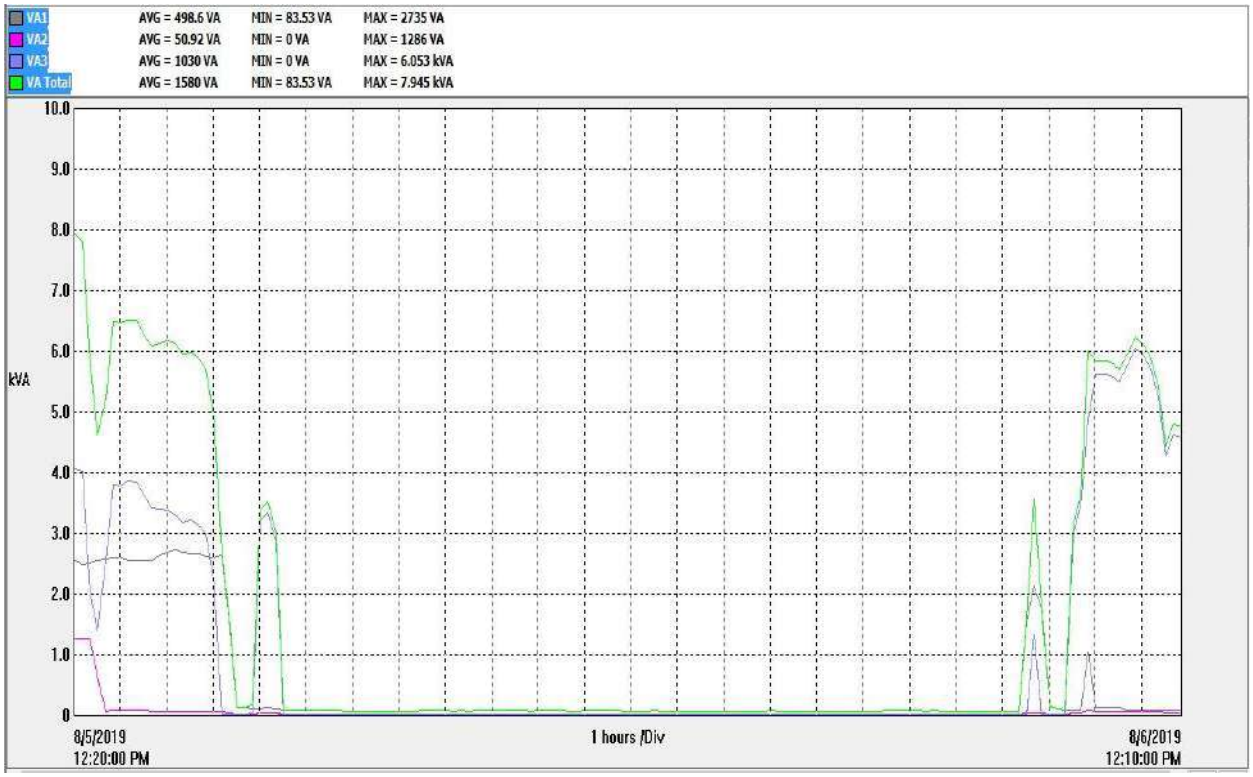


Fig.10 Shows the power (kVA) for 24 hours from 5/8/2019 12.20PM to 6/8/2019 12.10PM
Inference: Phase 2 shows very low KVA.

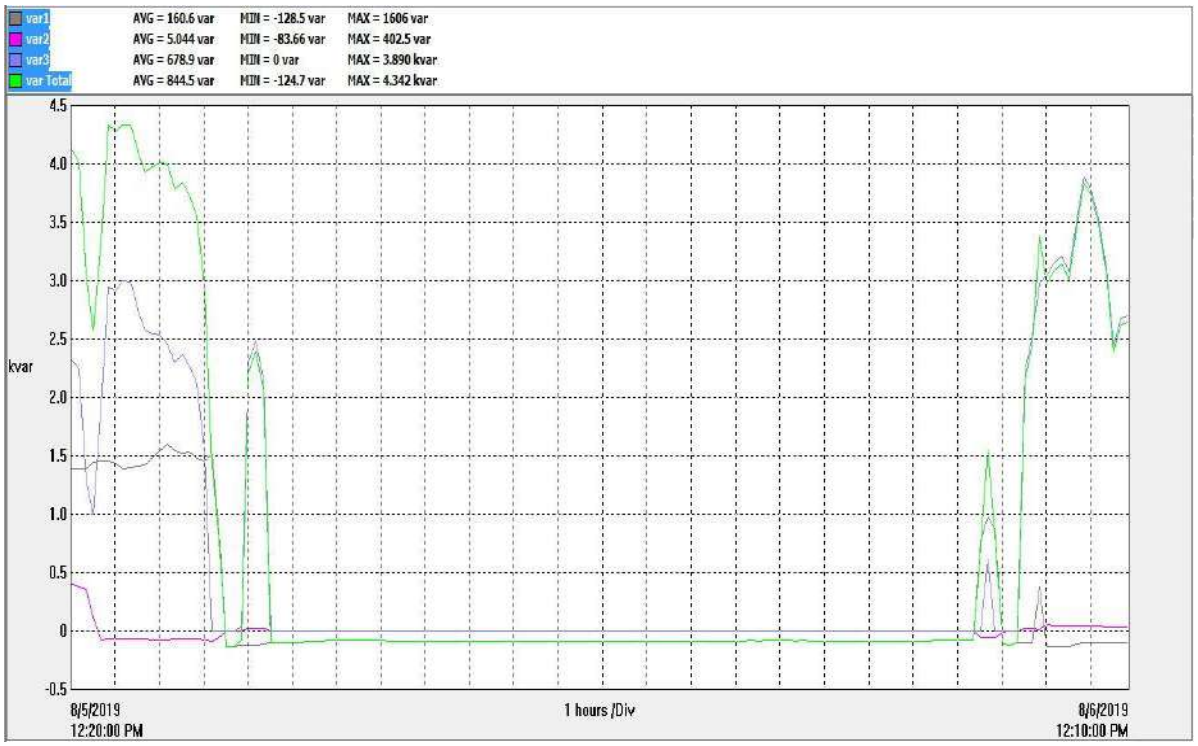


Fig.11 Shows the reactive power (kVAR) for 24 hours from 5/8/2019 12.20PM to 6/8/2019 12.10PM
Inference: Phase 2 shows very low KVAR compare to other two phases.

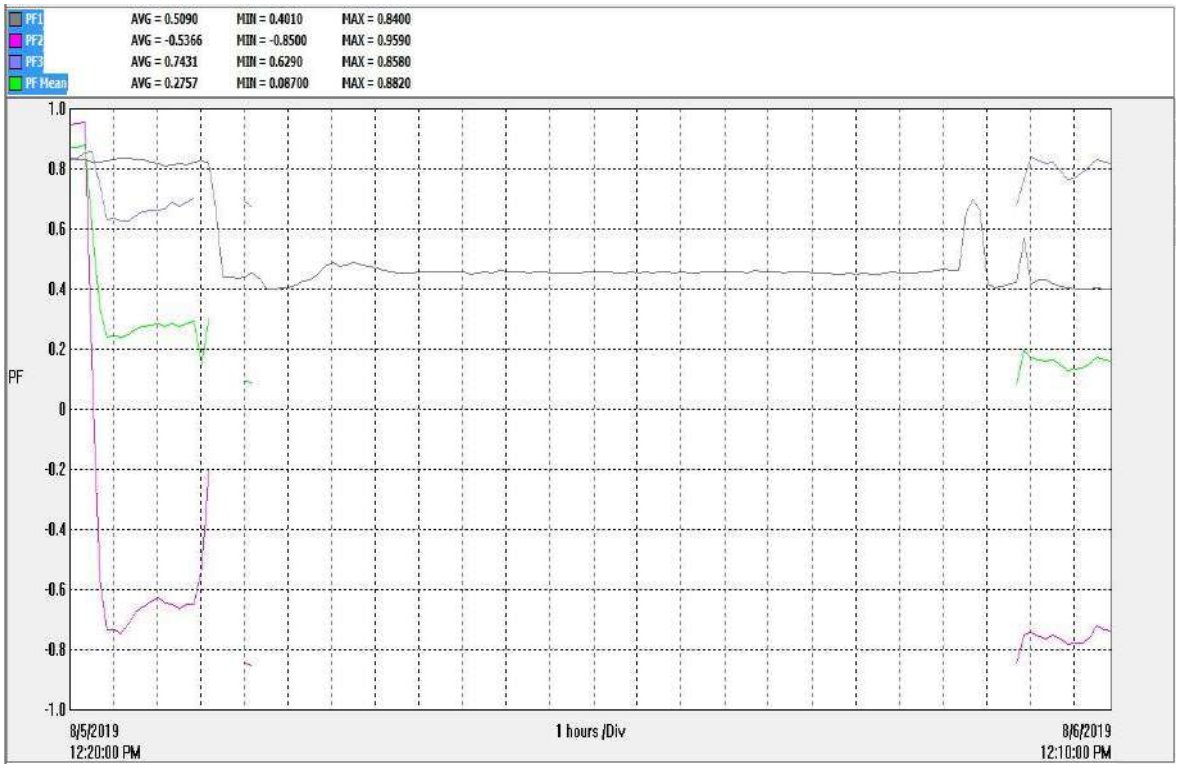


Fig.12 Shows the power factor (PF) for 24 hours from 5/8/2019 12.20PM to 6/8/2019 12.10PM
Inference: No unbalanced found here. Need to be improve the PF.

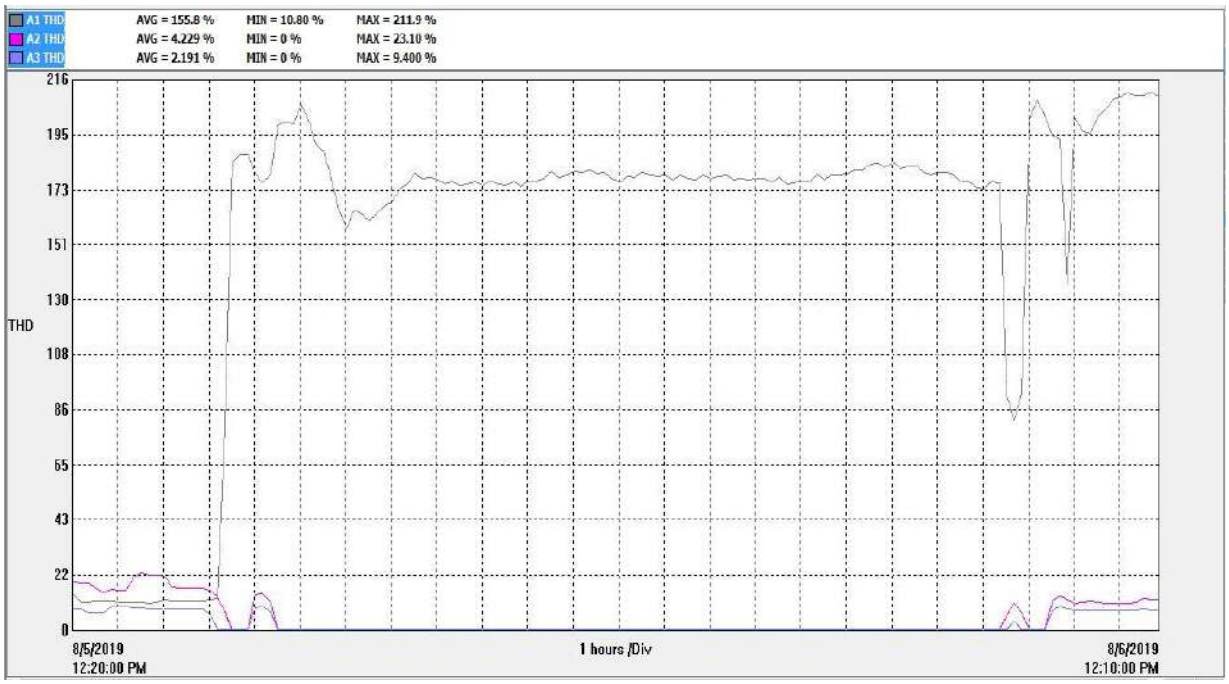


Fig.13 Shows the THD (voltage harmonics) for 24 hours from 5/8/2019 12.20PM to 6/8/2019 12.10PM

Inference: As THD is high, it is recommended to have harmonic filter as preventive measure against equipment failures.

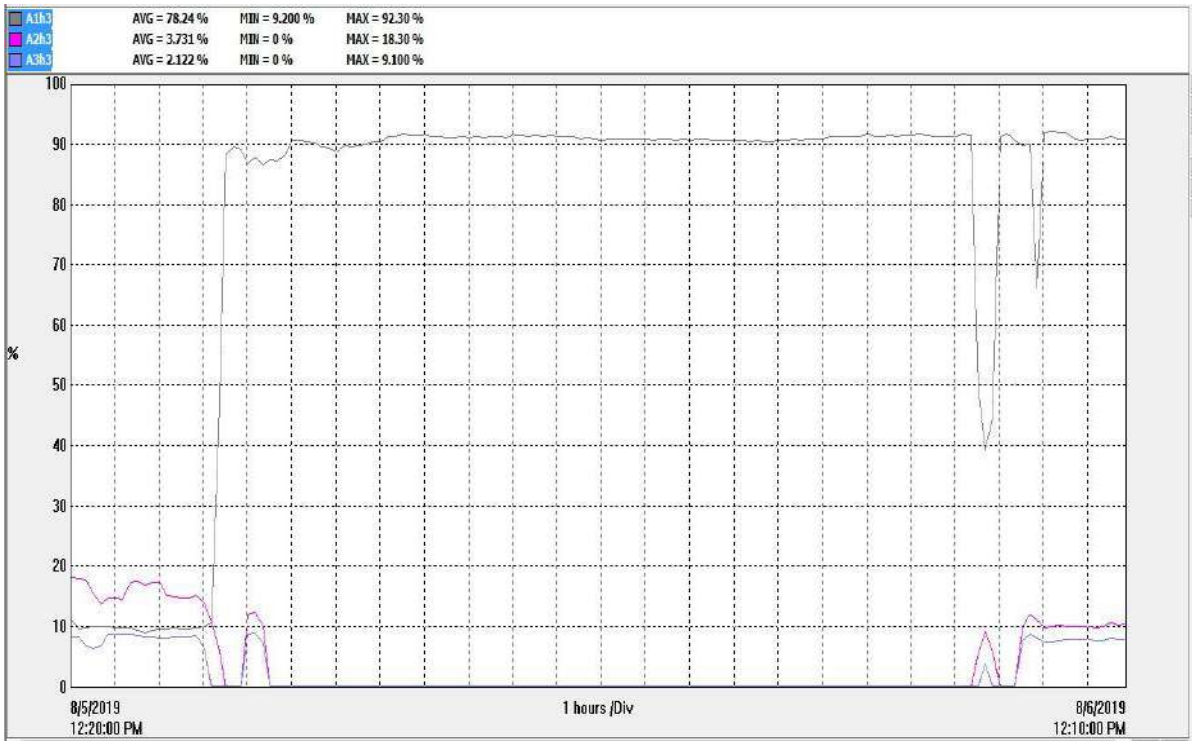


Fig.14 Shows the 3rd order THD (voltage harmonics) for 24 hours from 5/8/2019 12.20PM to 6/8/2019 12.10PM

Inference: As THD is high, it is recommended to have harmonic filter as preventive measure against equipment failures.

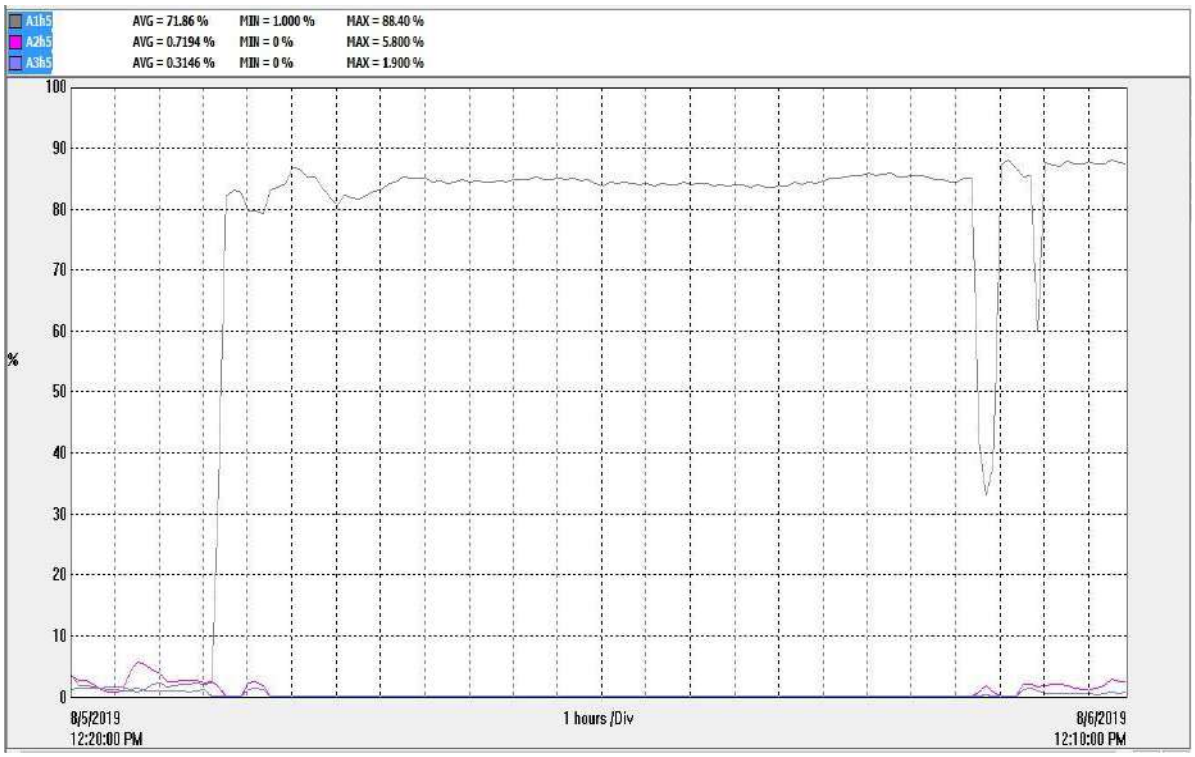


Fig.15 Shows the 5th THD (voltage harmonics) for 24 hours from 5/8/2019 12.20PM to 6/8/2019 12.10PM

Inference: As THD is high, it is recommended to have harmonic filter as preventive measure against equipment failures.

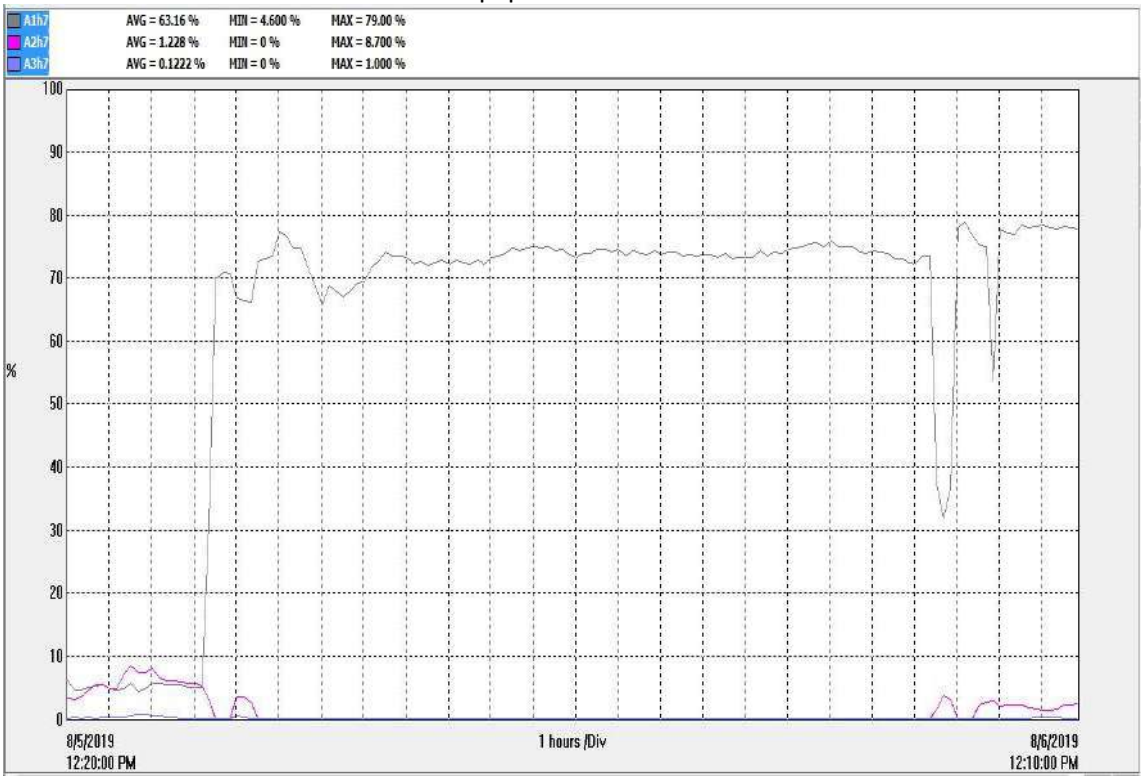


Fig.16 Shows the 7th THD (voltage harmonics) for 24 hours from 5/8/2019 12.20PM to 6/8/2019 12.10PM

Inference: As THD is high, it is recommended to have harmonic filter as preventive measure against equipment failures.

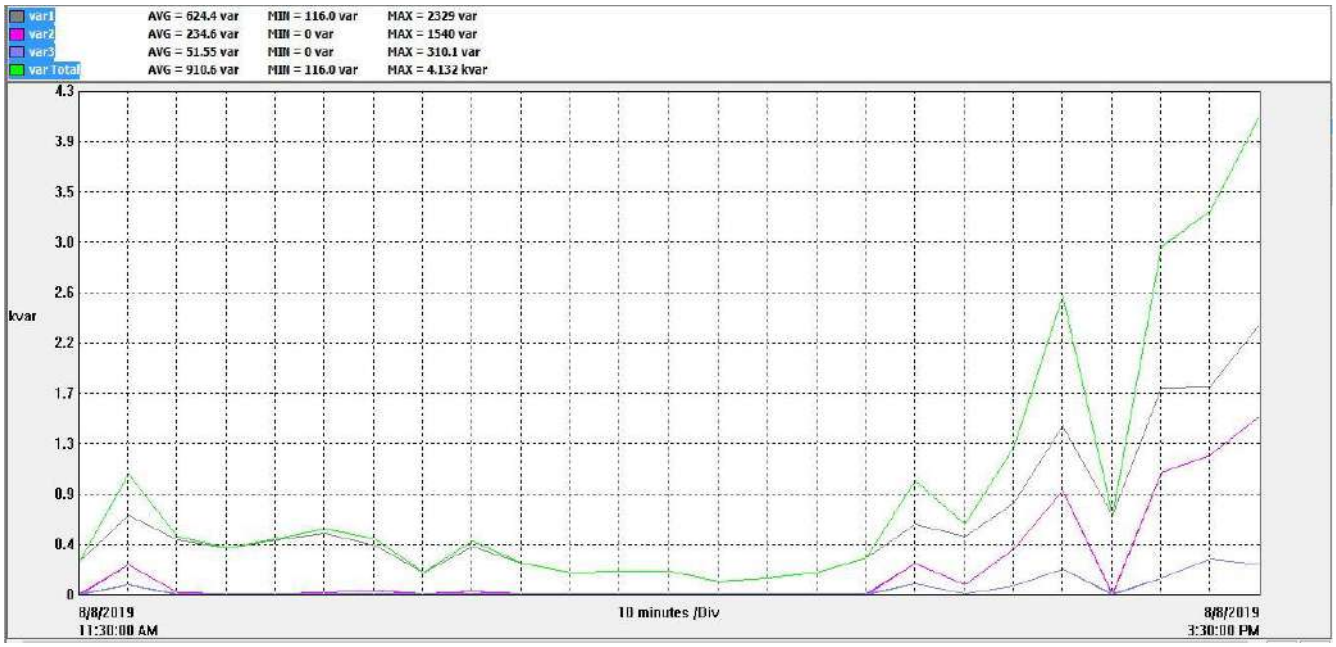


Fig.17 Shows the reactive power (kVAR) for 4 hours from 8/8/2019 11.30AM to 8/8/2019 3.30PM

Inference: Phase 3 shows very low KVAR compare to other two phases.

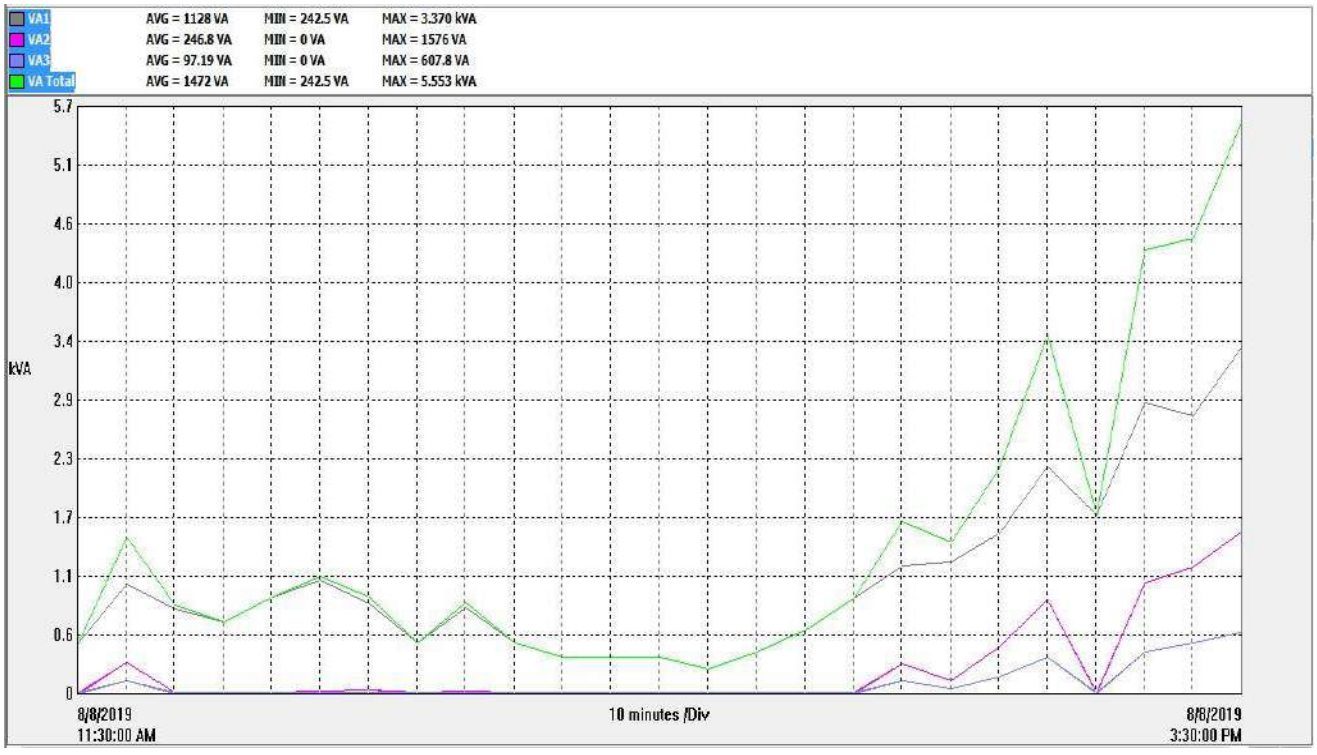


Fig.18 Shows the power (kVA) for 4 hours from 8/8/2019 11.30AM to 8/8/2019 3.30PM

Inference: Phase 3 shows very low KVA.

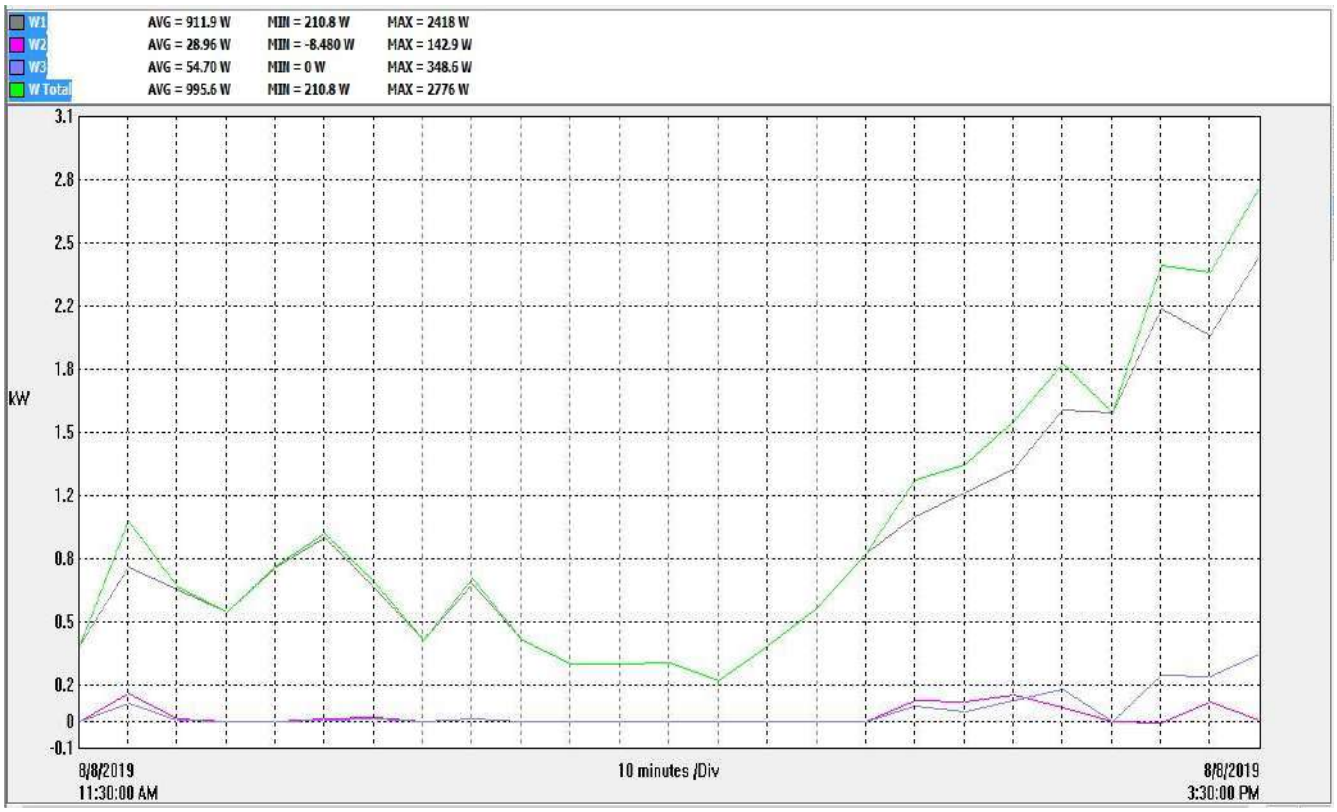


Fig.19 Shows the power (kW) for 4 hours from 8/8/2019 11.30AM to 8/8/2019 3.30PM

Inference: power distribution is not balanced. Phase 2 is found to be unbalanced and it loaded only 3% of the total.

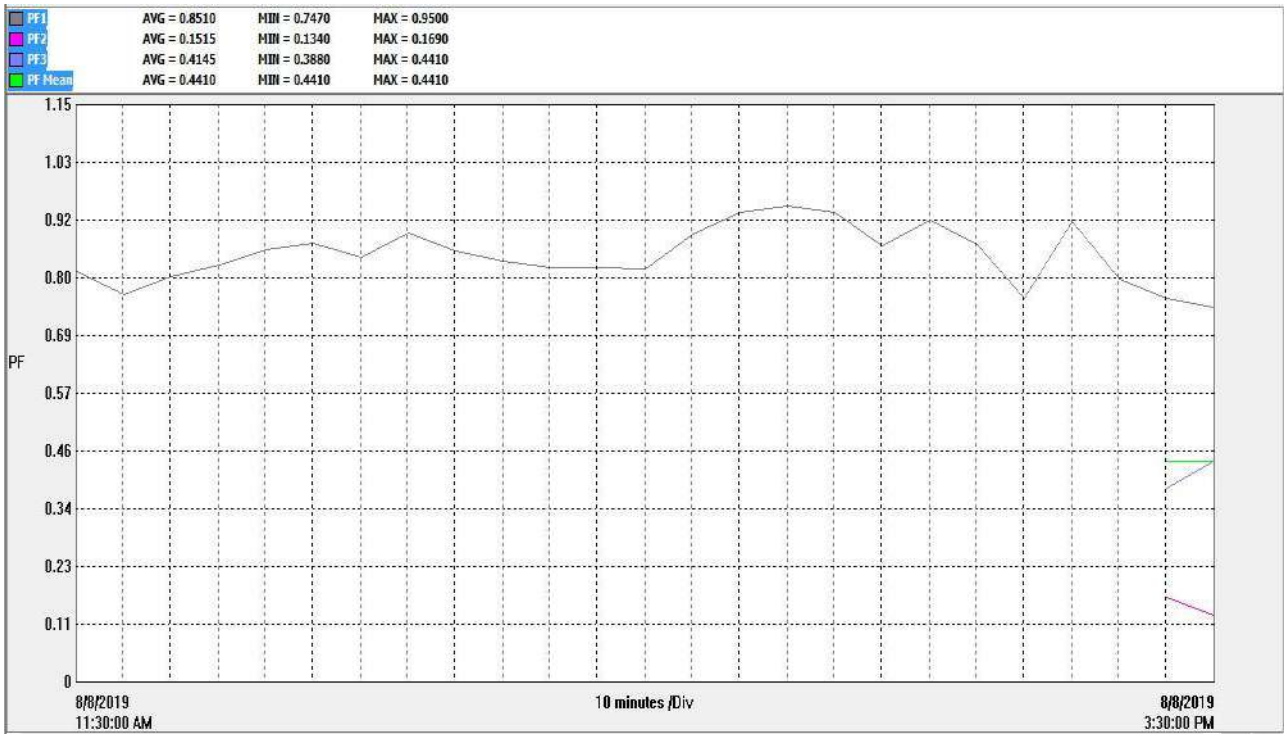


Fig.20 Shows the power factor (PF) for 4 hours from 8/8/2019 11.30AM to 8/8/2019 3.30PM

Inference: unbalanced found in phase 2. Need to be improve the PF.

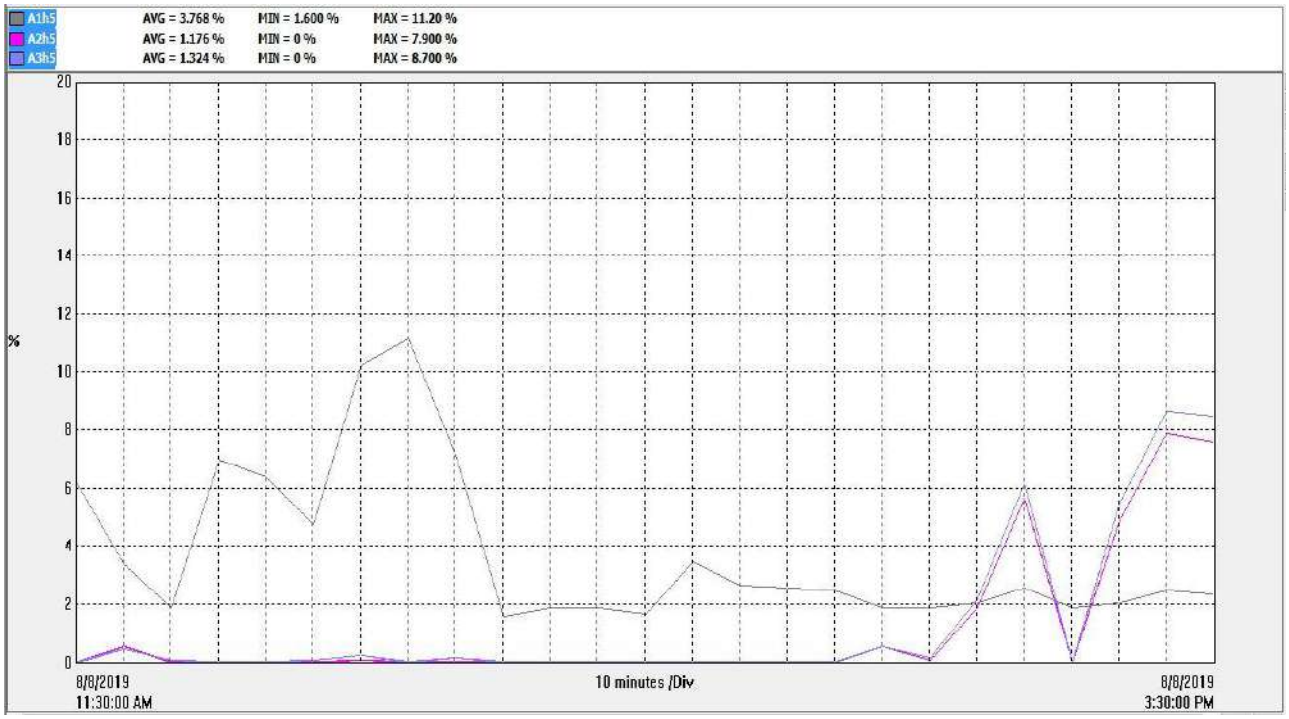


Fig.21 Shows the 5th order THD (voltage harmonics) for 4 hours from 8/8/2019 11.30AM to 8/8/2019 3.30PM

Inference: Harmonics seems to be normal. No need of harmonic filters.

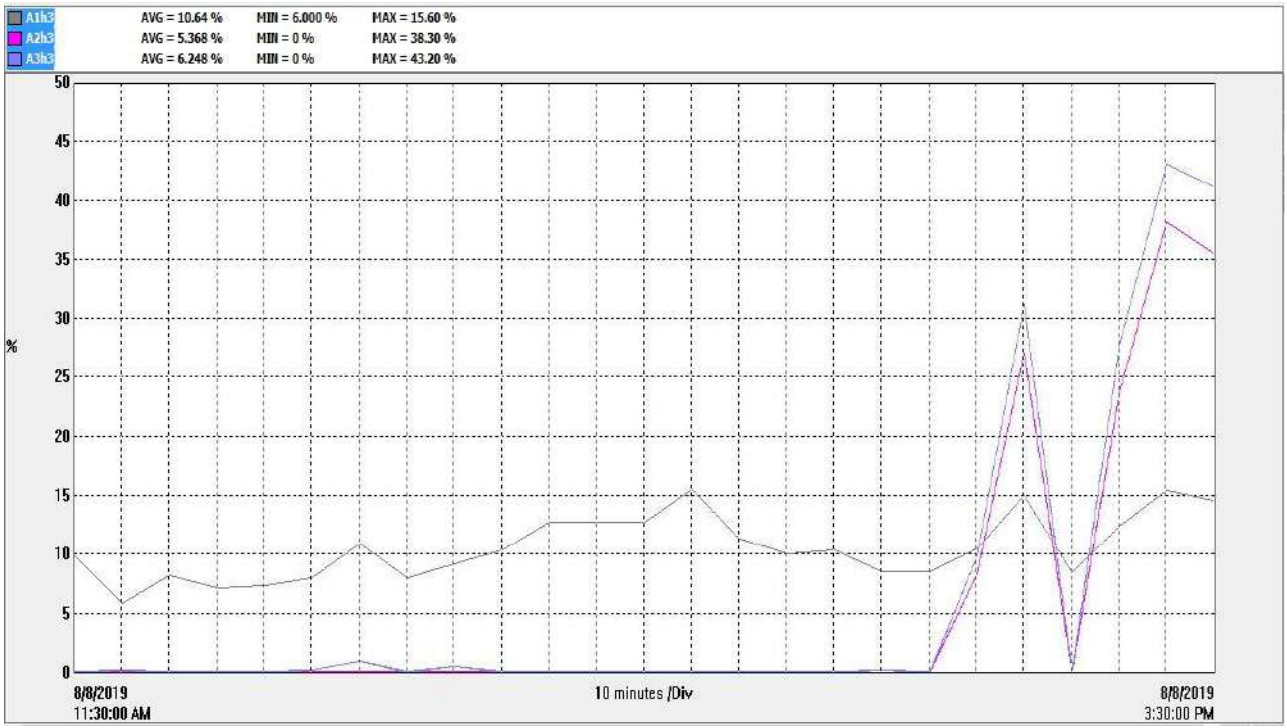


Fig.22 Shows the 3rd order THD (voltage harmonics) for 4 hours from 8/8/2019 11.30AM to 8/8/2019 3.30PM

Inference: Harmonics seems to be normal. No need of harmonic filters.

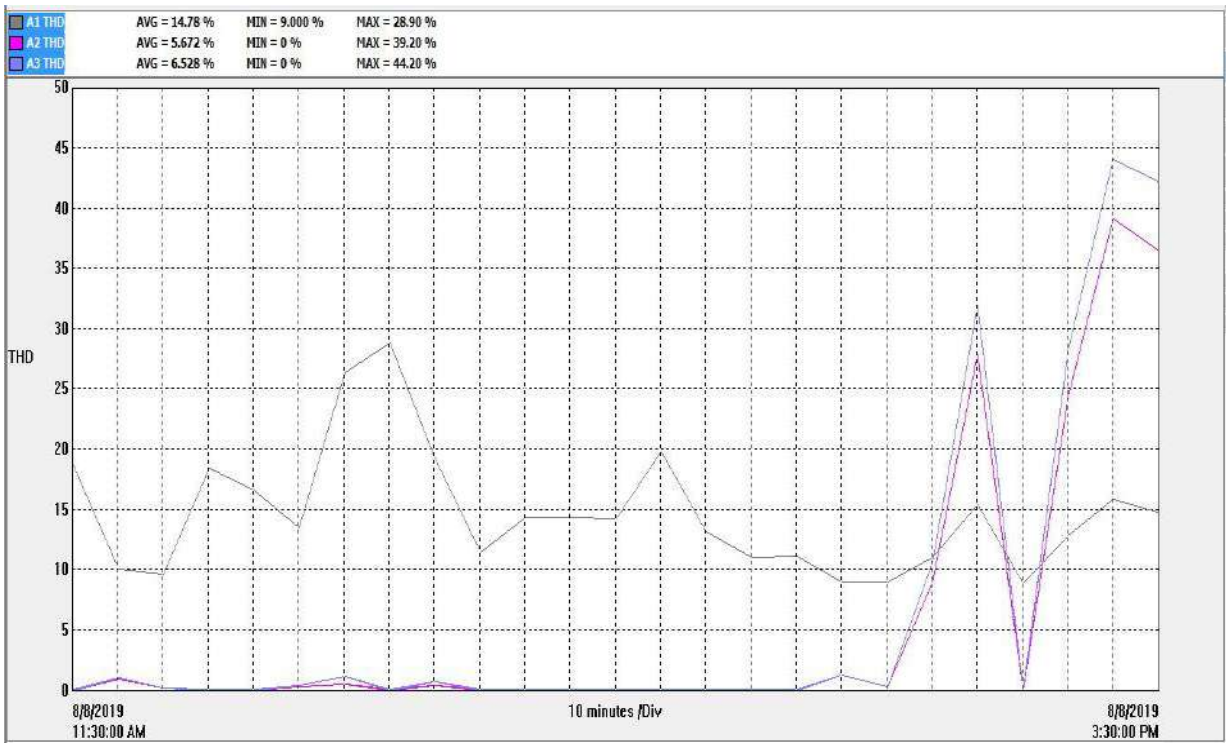


Fig.23 Shows the THD (voltage harmonics) for 4 hours from 8/8/2019 11.30AM to 8/8/2019 3.30PM

Inference: Harmonics seems to be normal. No need of harmonic filters.

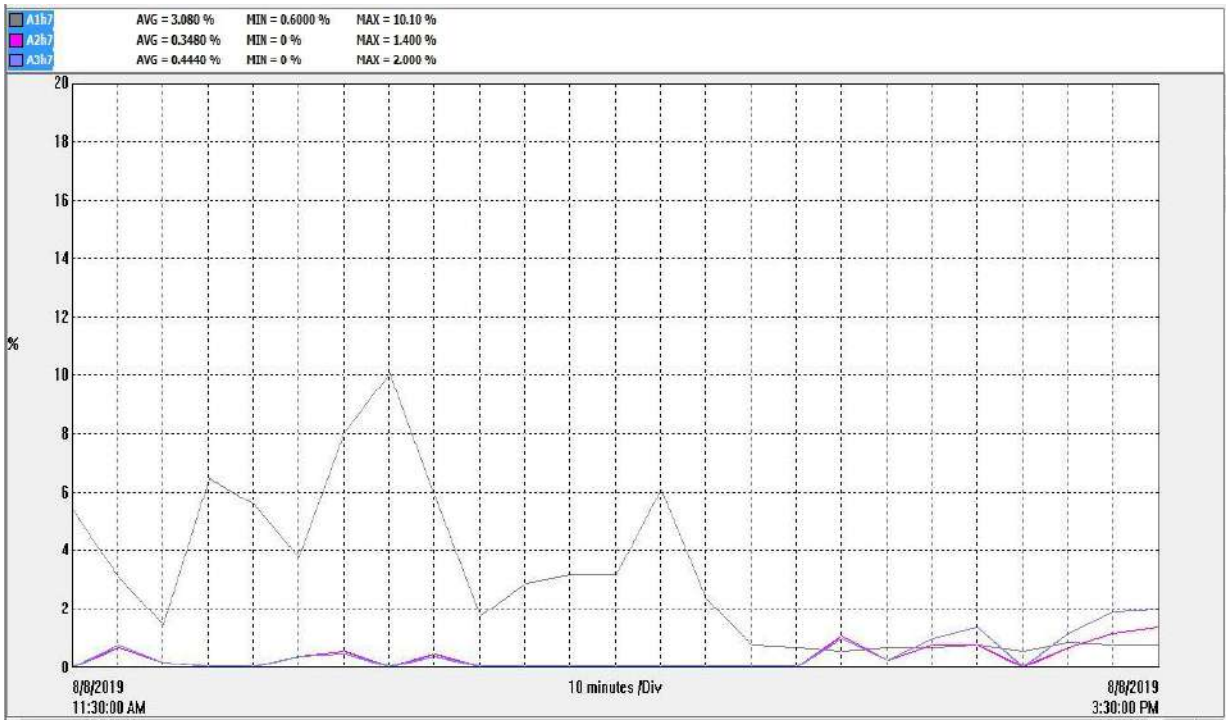


Fig.24 Shows the 7th order THD (voltage harmonics) for 4 hours from 8/8/2019 11.30AM to 8/8/2019 3.30PM

Inference: Harmonics seems to be normal. No need of harmonic filters.

Old Building

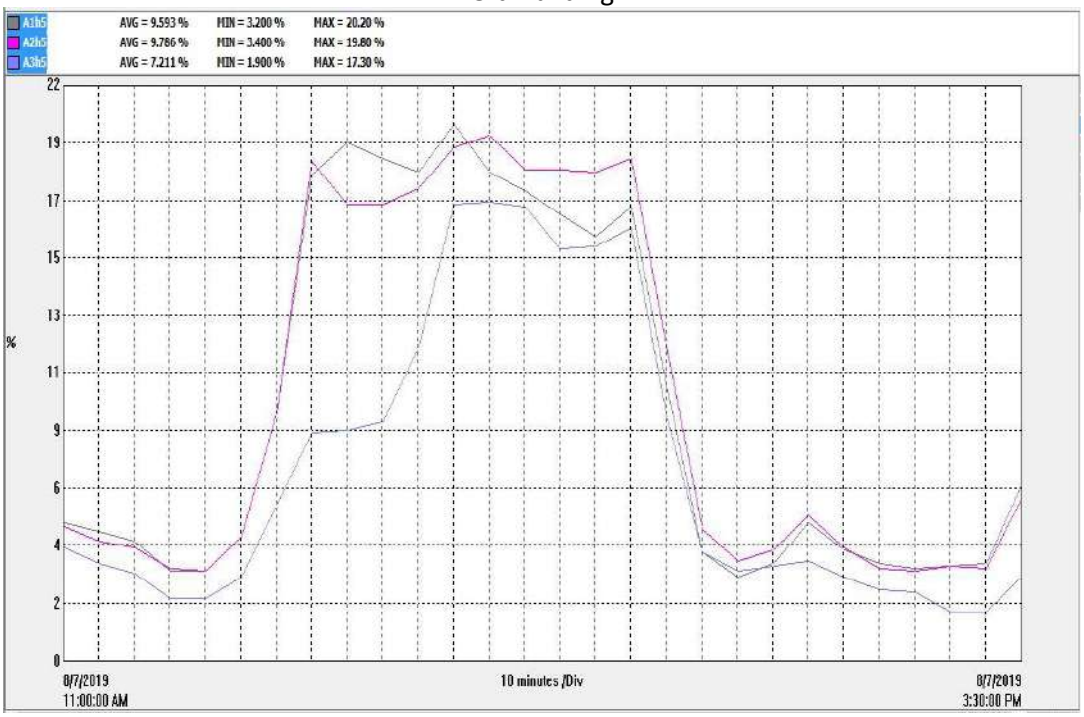


Fig.25 Shows the 5th order THD (voltage harmonics) for 4.30 hours from 7/8/2019 11.00AM to 7/8/2019 3.30PM

Inference: Harmonics seems to be normal. No need of harmonic filters.

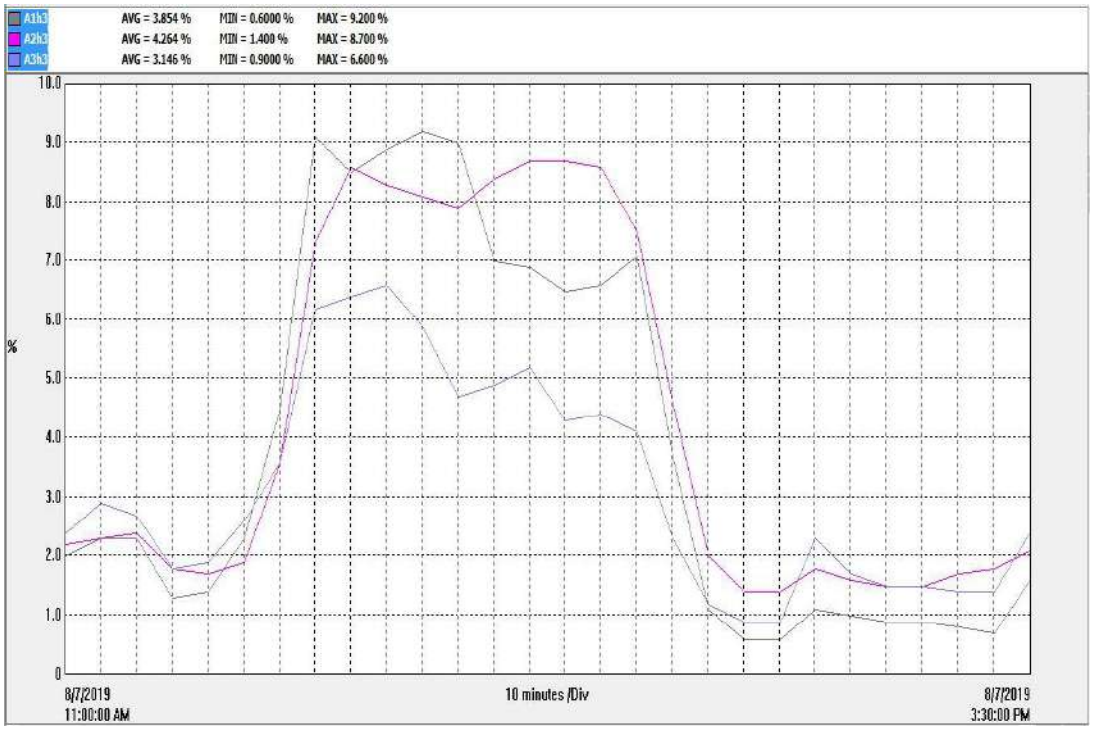


Fig.26 Shows the 3rd order THD (voltage harmonics) for 4.30 hours from 7/8/2019 11.00AM to 7/8/2019 3.30PM

Inference: Harmonics seems to be normal. No need of harmonic filters.

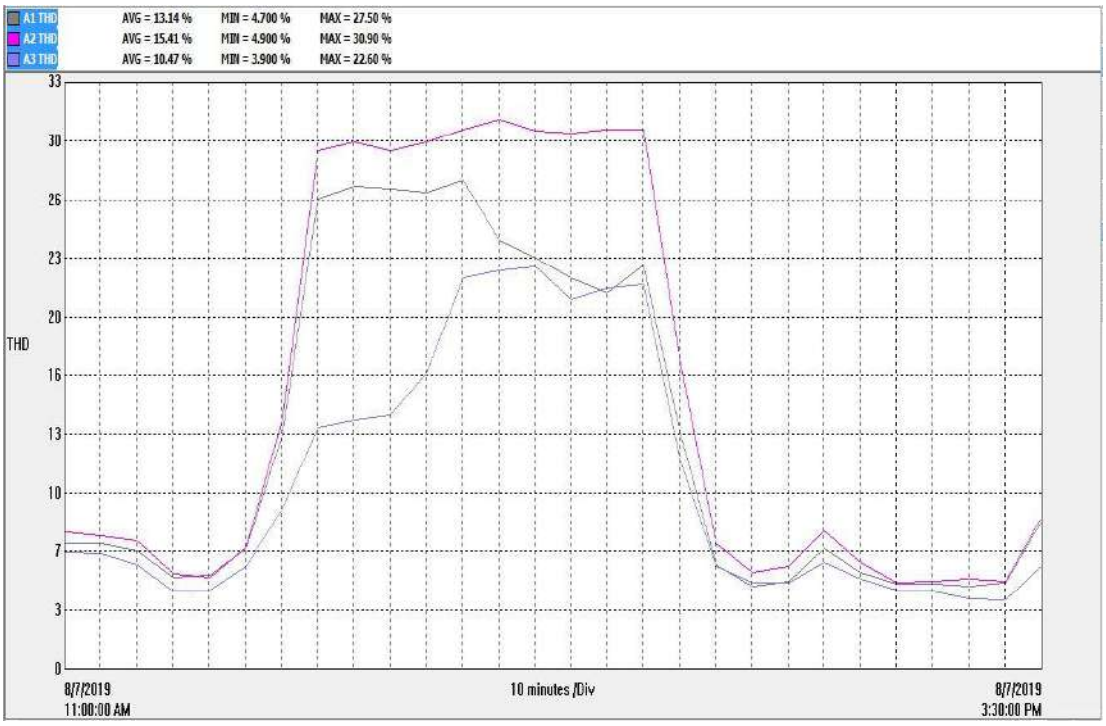


Fig.27 Shows the THD (voltage harmonics) for 4.30 hours from 7/8/2019 11.00AM to 7/8/2019 3.30PM

Inference: Harmonics seems to be normal. No need of harmonic filters.

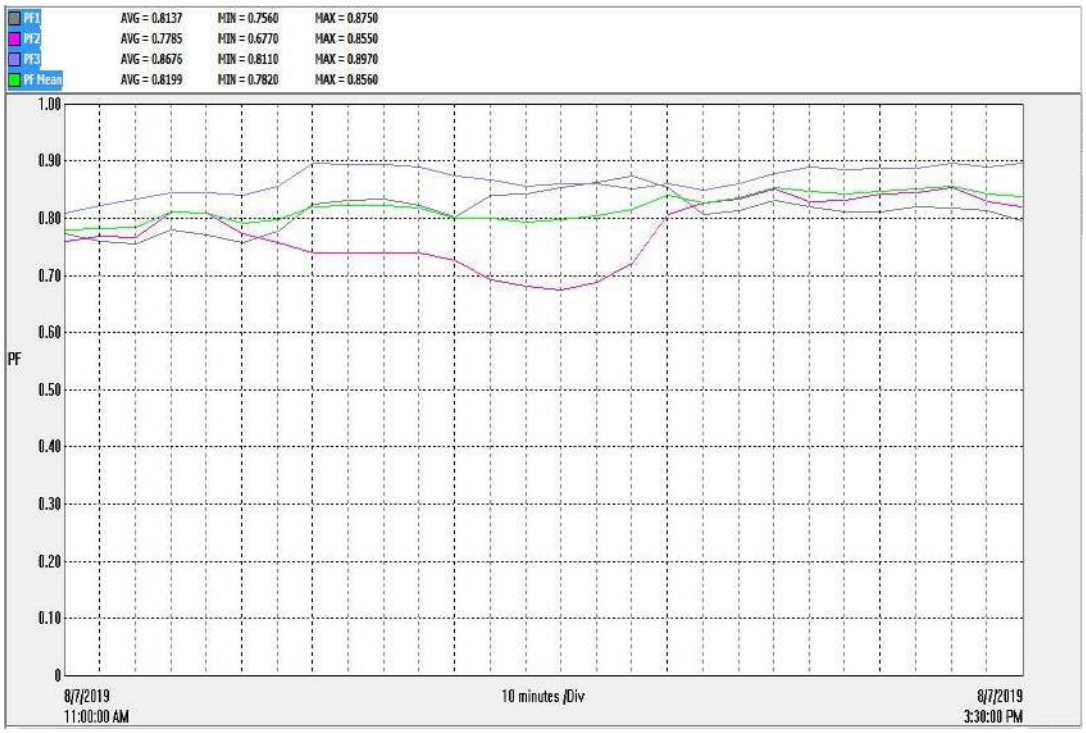


Fig.28 Shows the power factor (PF) for 4.30 hours from 7/8/2019 11.00AM to 7/8/2019 3.30PM

Inference: No unbalanced found here. Need to be improve the PF.

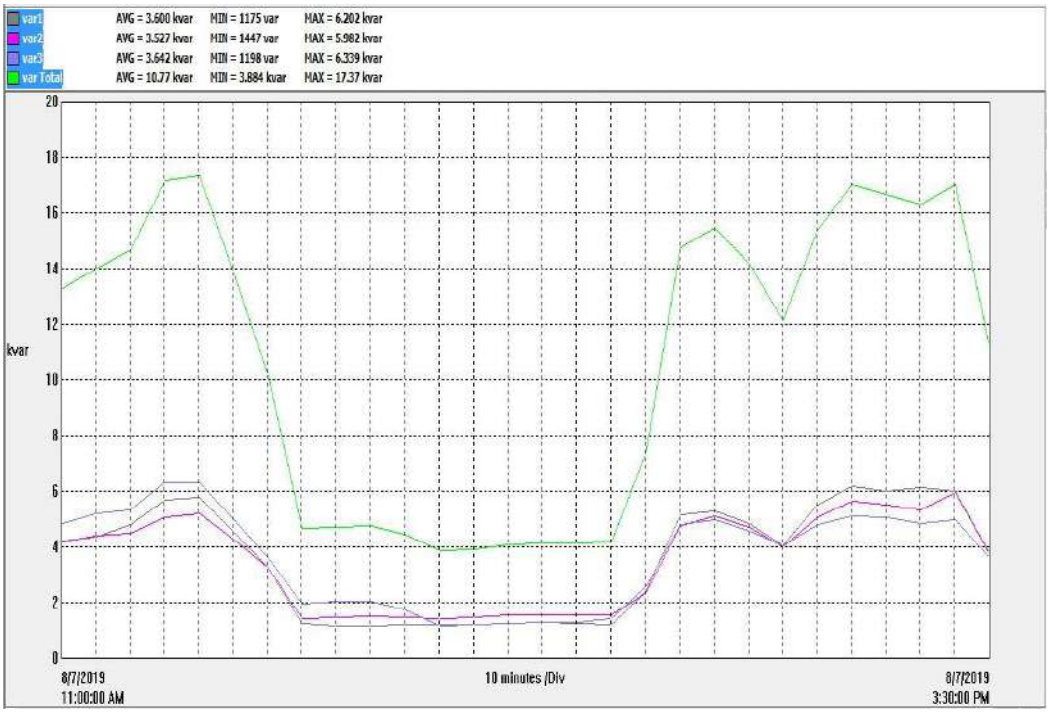


Fig.29 Shows the reactive power (kVAR) for 4.30 hours from 7/8/2019 11.00AM to 7/8/2019 3.30PM

Inference: KVAR shows normal condition.

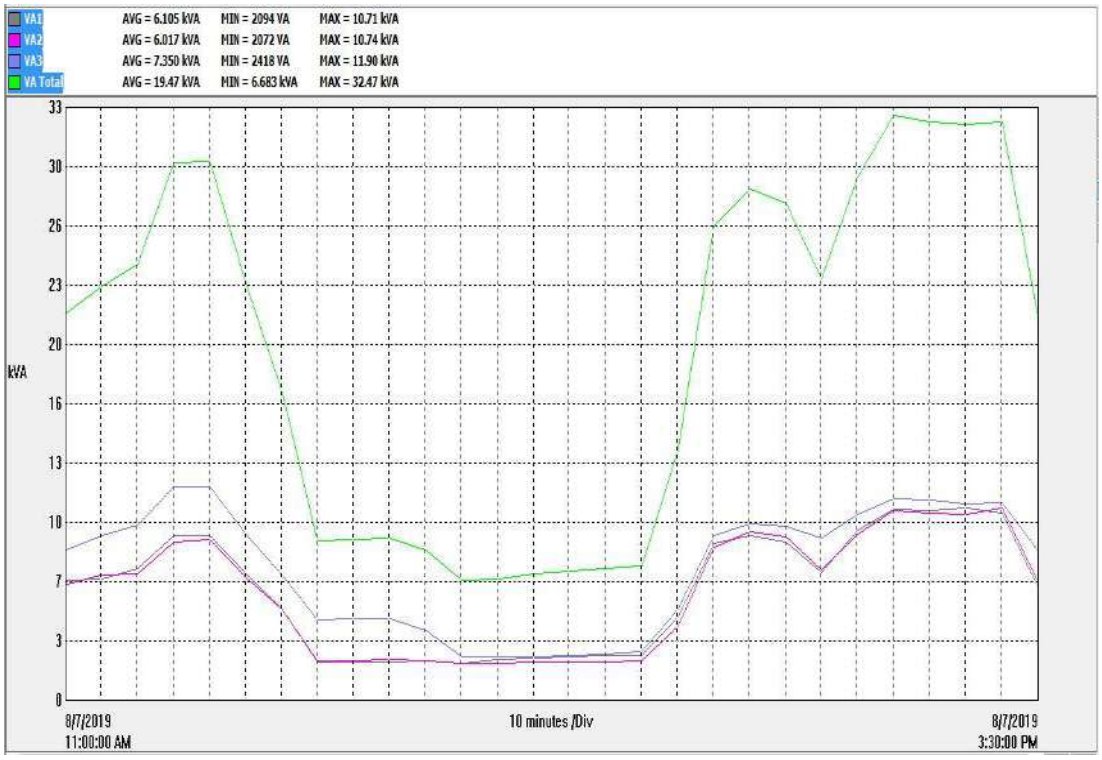


Fig.30 Shows the power (kVA) for 4.30 hours from 7/8/2019 11.00AM to 7/8/2019 3.30PM

Inference: No specific abnormality found here.

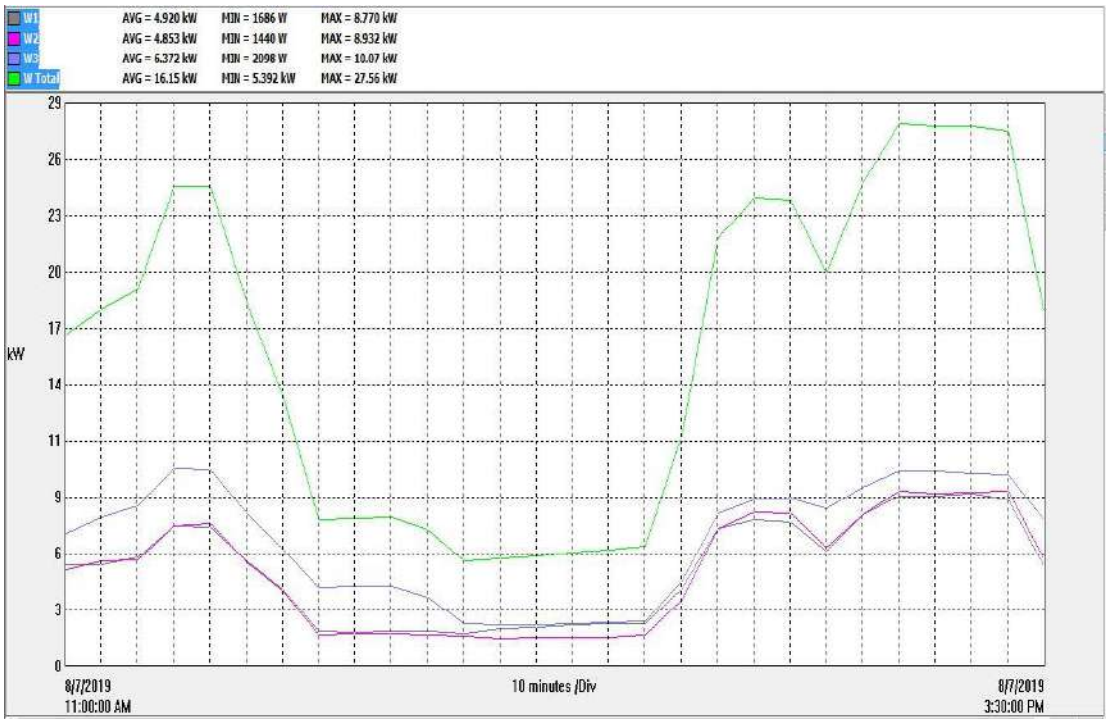


Fig.31 Shows the power (kW) for 4.30 hours from 7/8/2019 11.00AM to 7/8/2019 3.30PM

Inference: Power distribution is in balanced condition.

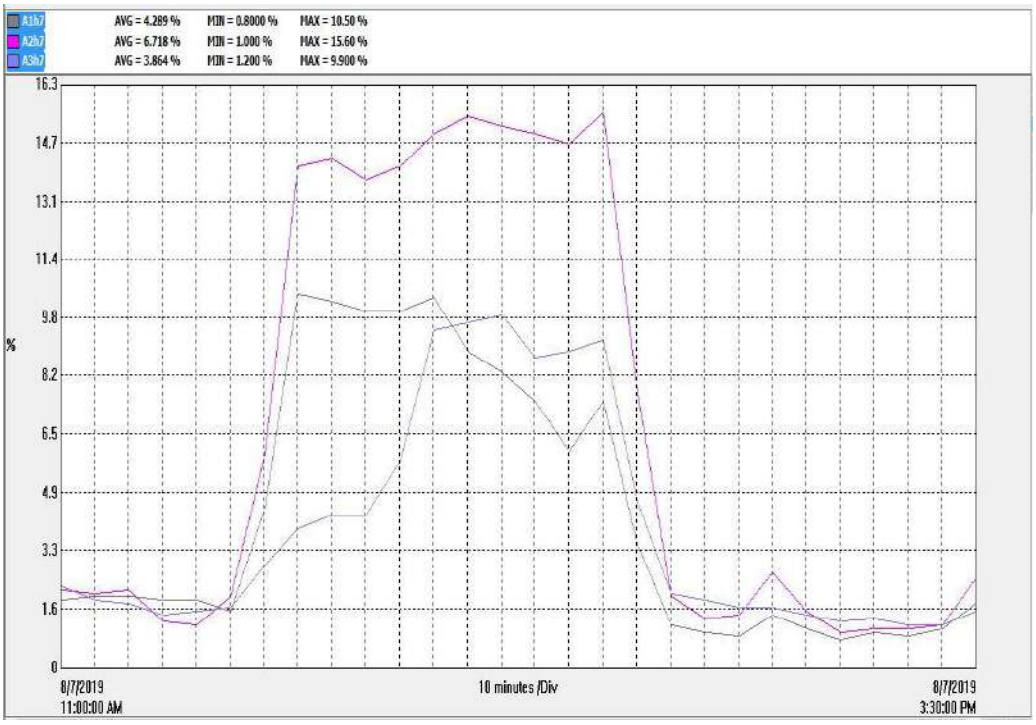


Fig.32 Shows the 7th order THD (voltage harmonics) for 4.30 hours from 7/8/2019 11.00AM to 7/8/2019 3.30PM

Inference: Harmonics seems to be normal. No need of harmonic filters.

NEW BUILDING

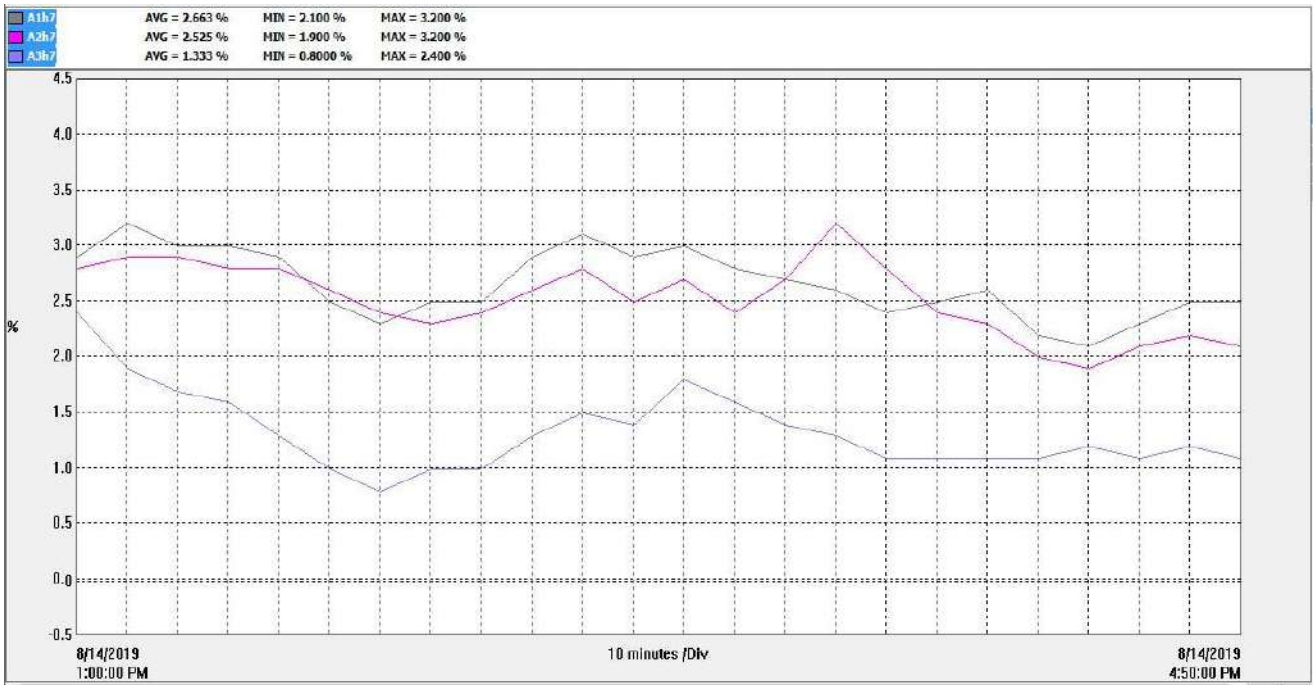


Fig.33 Shows the 7th order THD (voltage harmonics) for 3.50 hours from 14/8/2019 1.00PM to 14/8/2019 4.50PM

Inference: Harmonics seems to be normal. No need of harmonic filters.

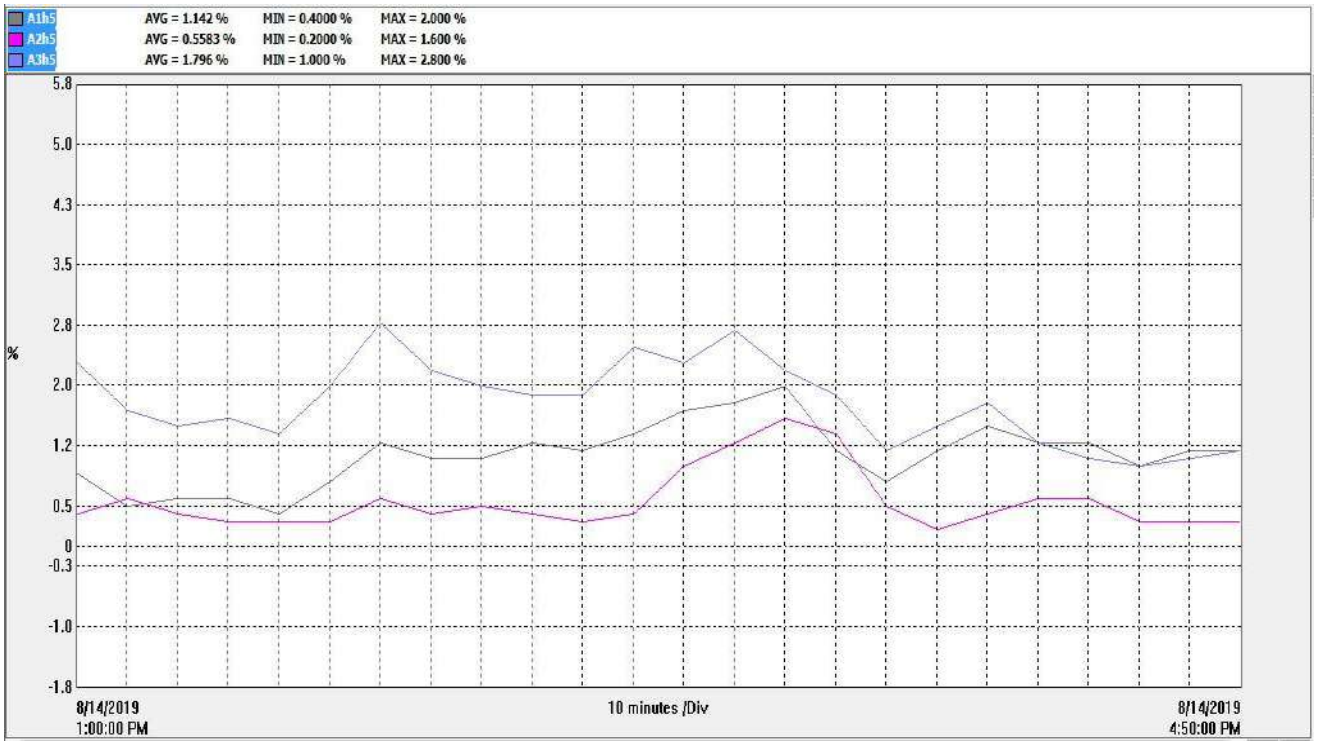


Fig.34 Shows the 5th order THD (voltage harmonics) for 3.50 hours from 14/8/2019 1.00PM to 14/8/2019 4.50PM

Inference: Harmonics seems to be normal. No need of harmonic filters.

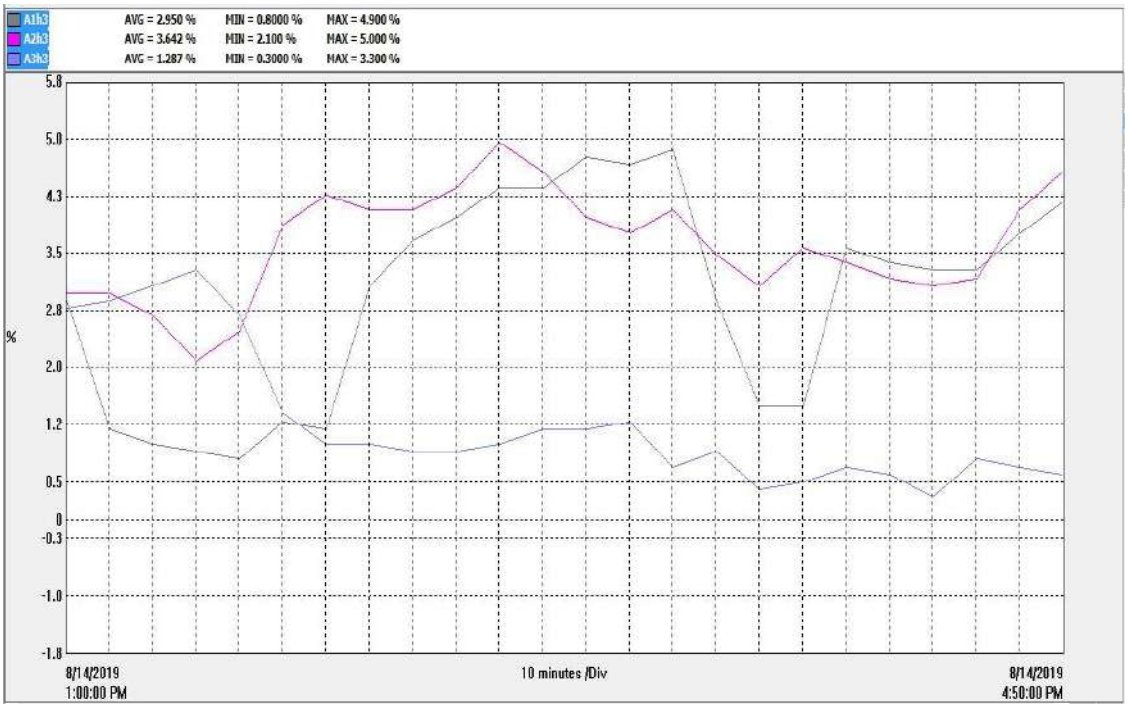


Fig.35 Shows the 3th order THD (voltage harmonics) for 3.50 hours from 14/8/2019 1.00PM to 14/8/2019 4.50PM

Inference: Harmonics seems to be normal. No need of harmonic filters.

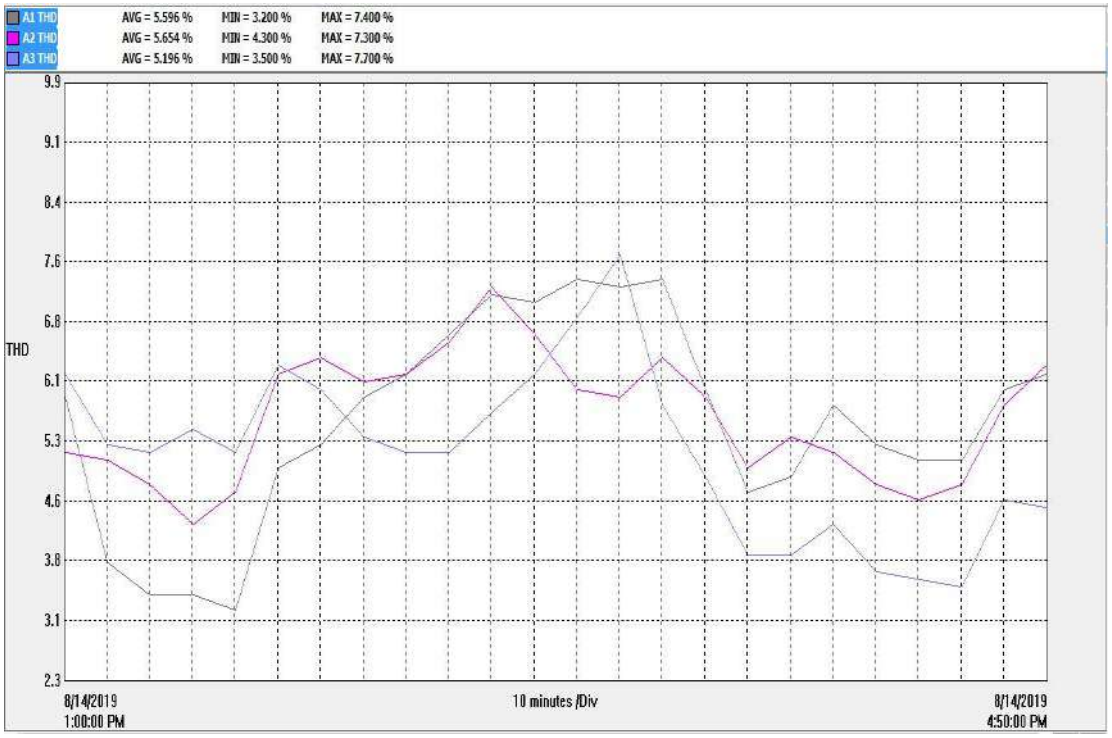


Fig.36 Shows the THD (voltage harmonics) for 3.50 hours from 14/8/2019 1.00PM to 14/8/2019 4.50PM

Inference: Harmonics seems to be normal. No need of harmonic filters.

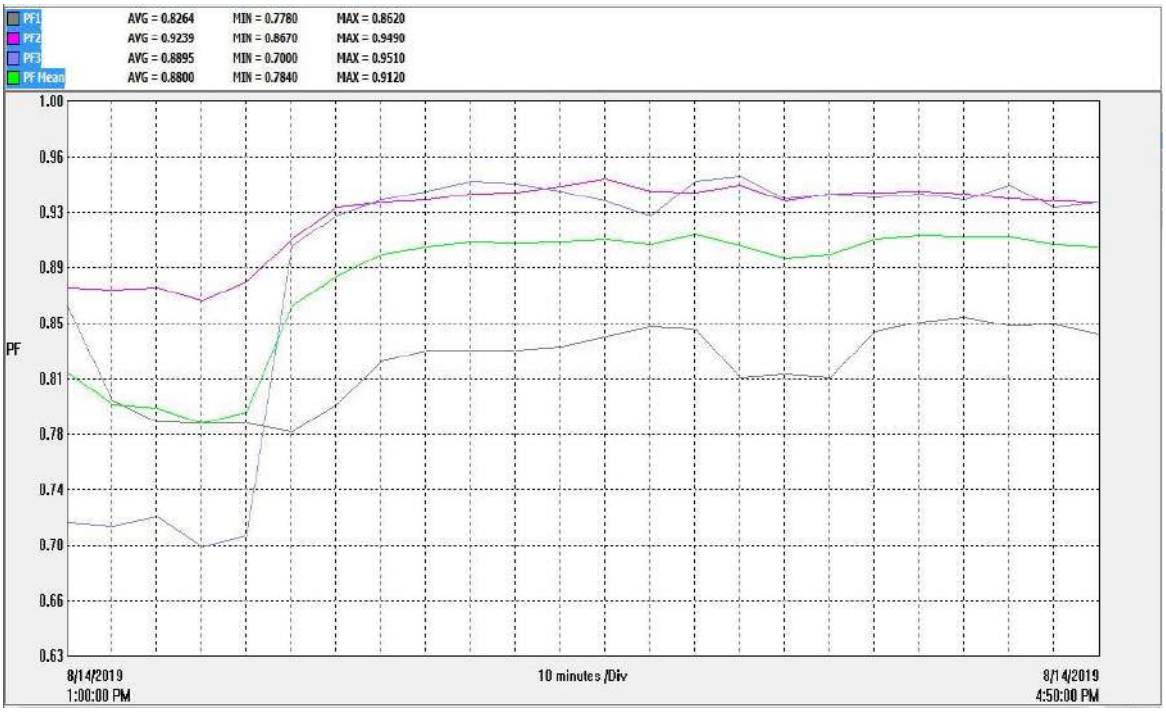


Fig.37 Shows the power factor (PF) for 3.50 hours from 14/8/2019 1.00PM to 14/8/2019 4.50PM

Inference: No unbalance found here.

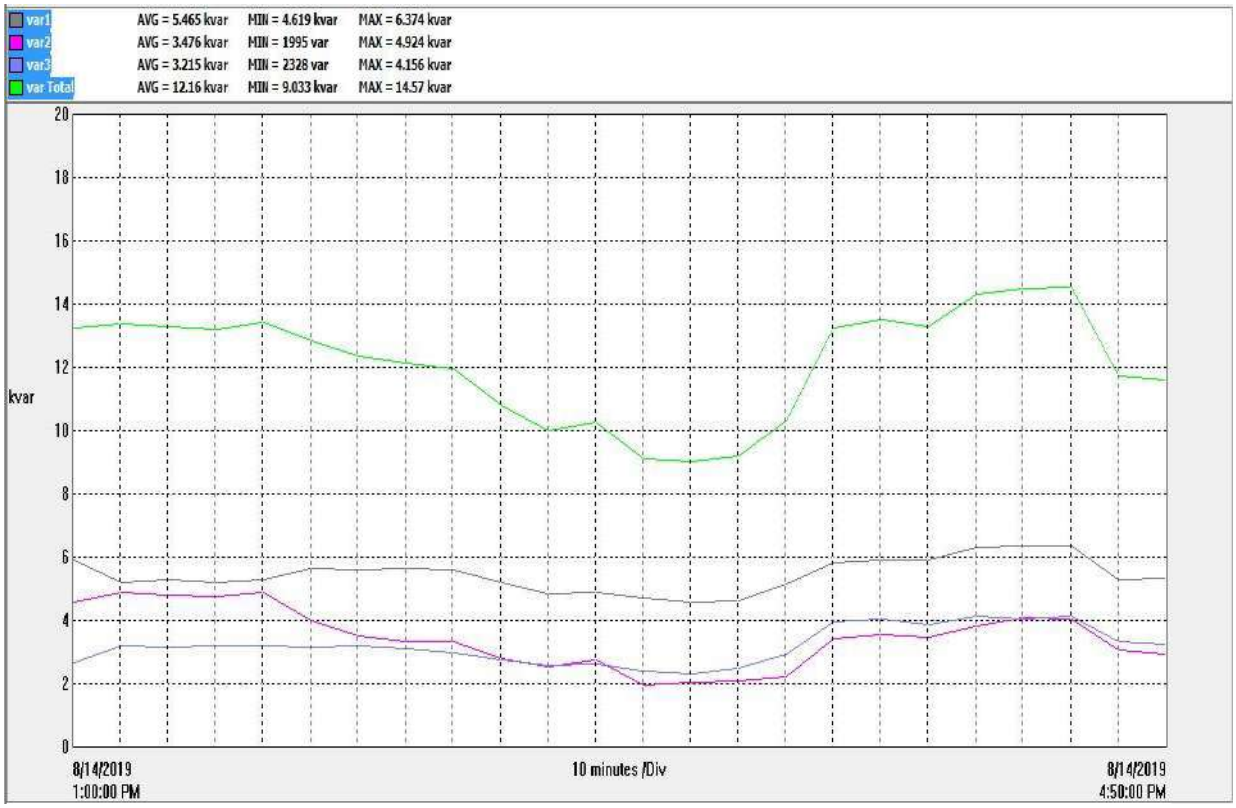


Fig.38 Shows the reactive power (kVAR) for 3.50 hours from 14/8/2019 1.00PM to 7/8/2019 4.50PM

Inference: KVAR shows normal condition.

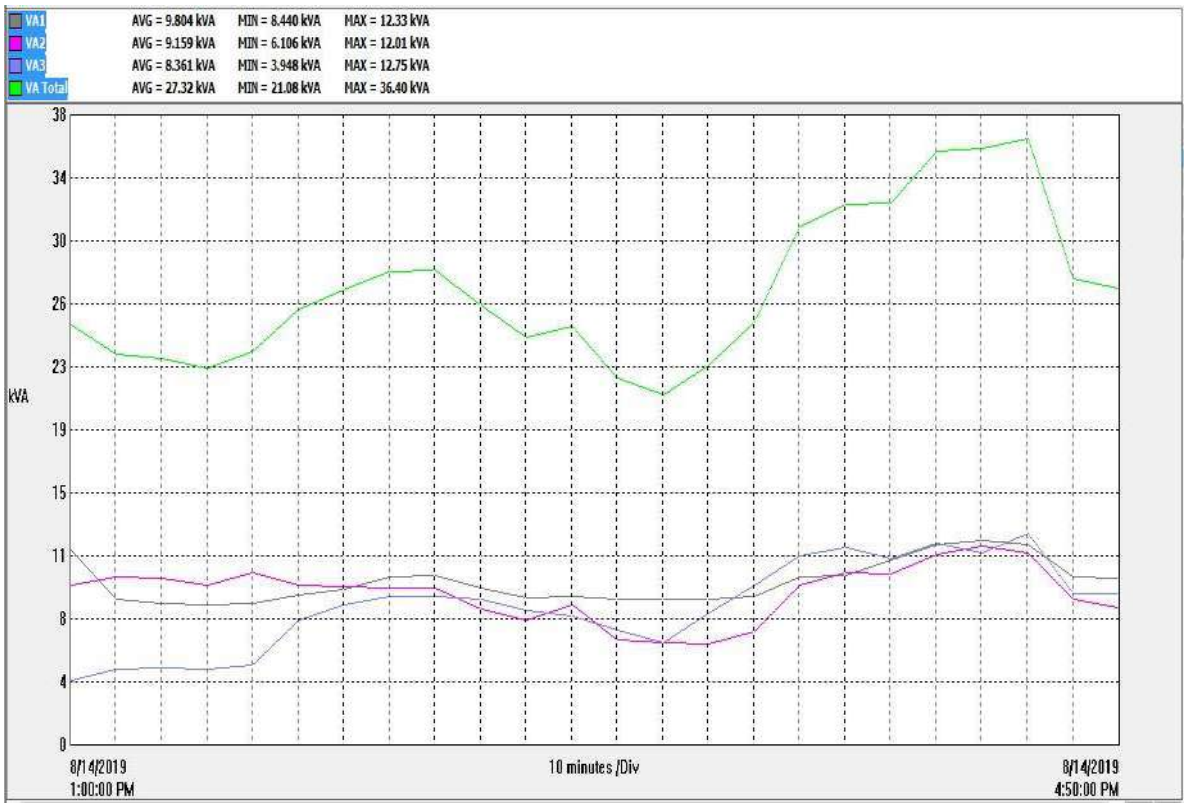


Fig.39 Shows the power (kVA) for 3.50 hours from 14/8/2019 1.00PM to 14/8/2019 4.50PM

Inference: KVAR shows normal condition.

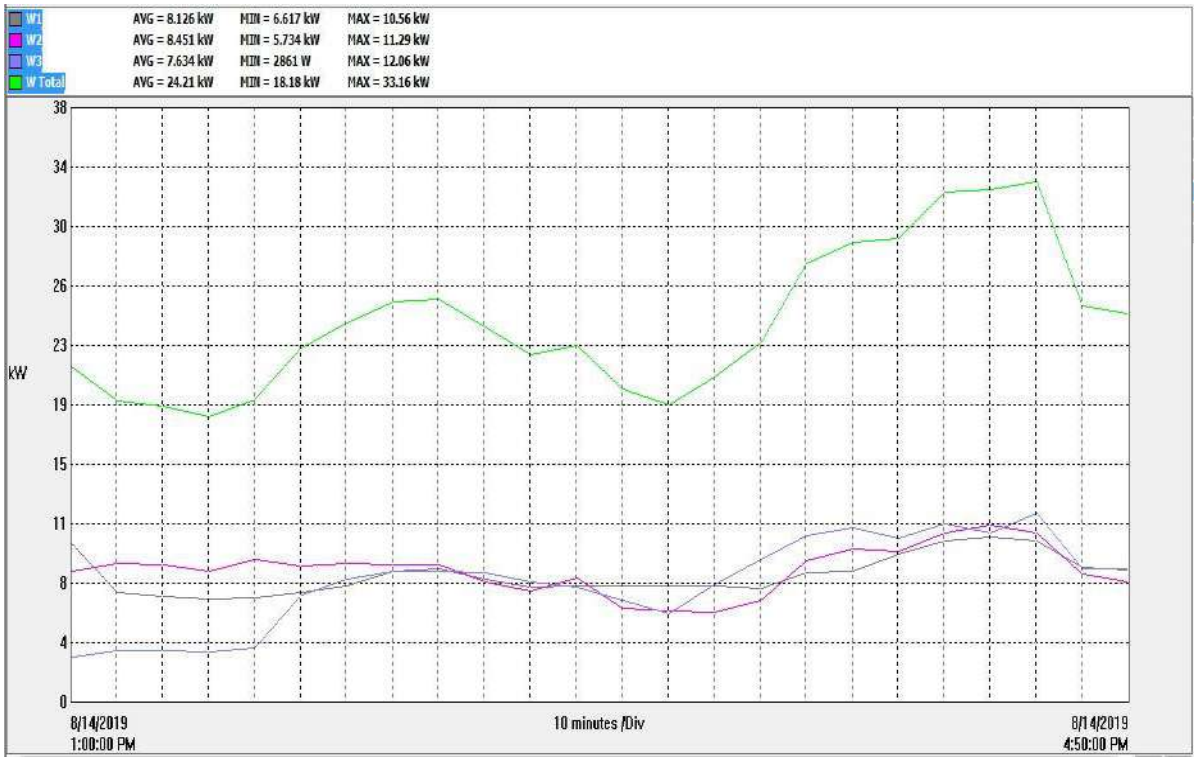


Fig.40 Shows the power (kW) for 3.50 hours from 14/8/2019 1.00PM to 14/8/2019 4.50PM
Inference : Power distribution is balance.

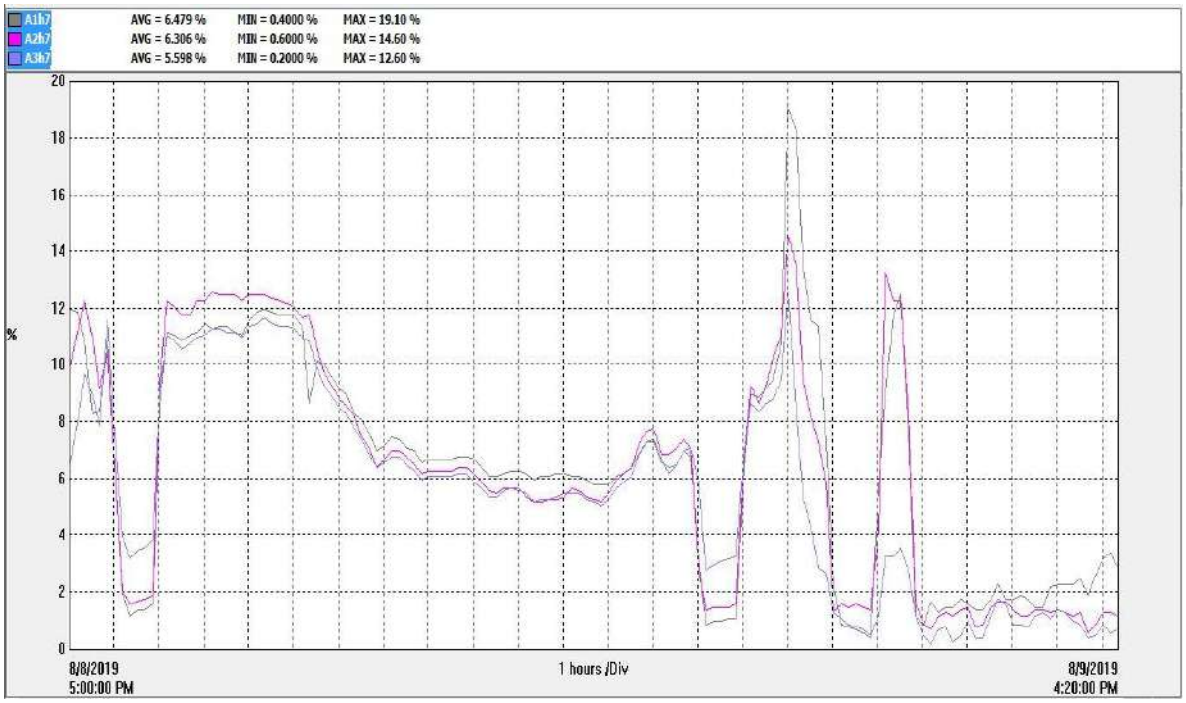


Fig.41 Shows the 7th order THD (voltage harmonics) for 24 hours from 8/8/2019 5.00PM to 9/8/2019 4.20PM

Inference: Harmonics seems to be normal. No need of harmonic filters.

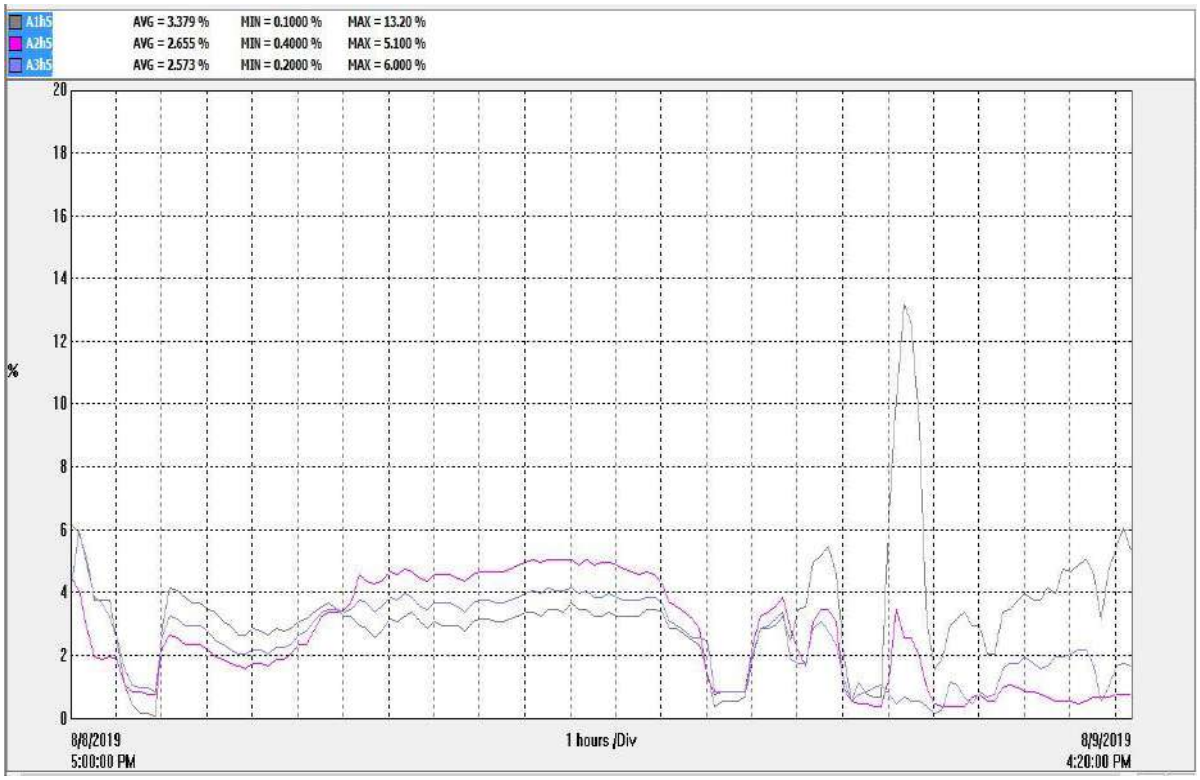


Fig.42 Shows the 5th order THD (voltage harmonics) for 24 hours from 8/8/2019 5.00PM to 9/8/2019 4.20PM

Inference: Harmonics seems to be normal. No need of harmonic filters.

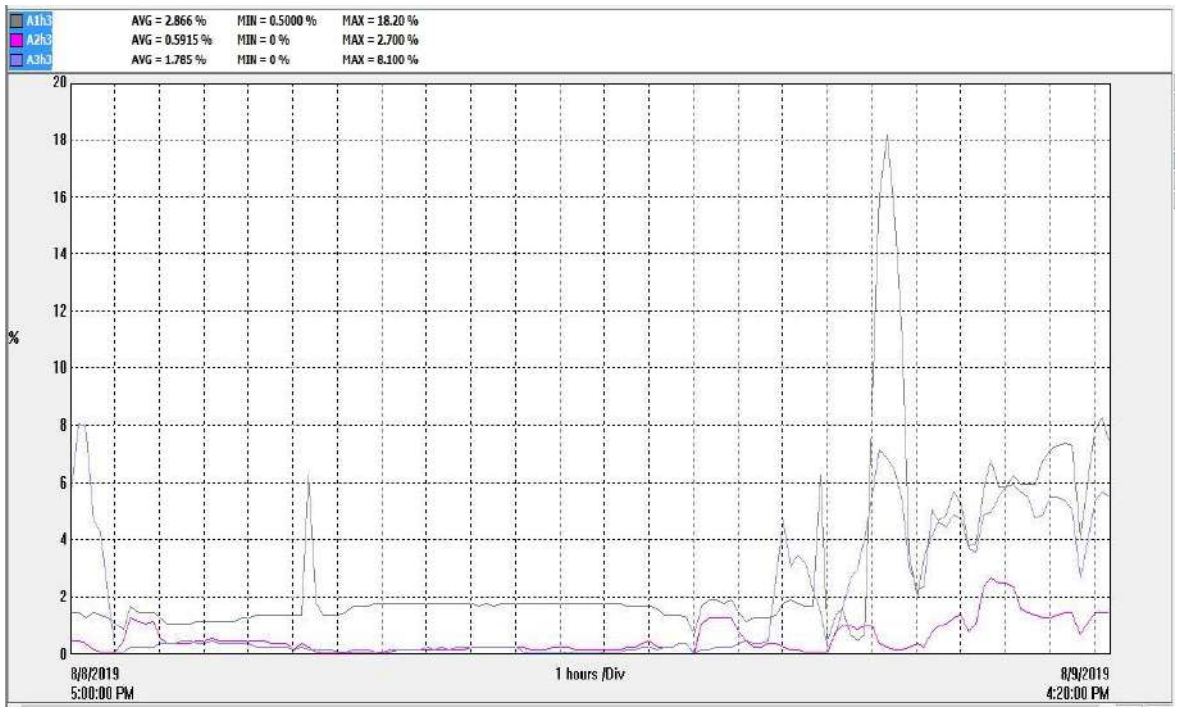


Fig.43 Shows the 3rd order THD (voltage harmonics) for 24 hours from 8/8/2019 5.00PM to 9/8/2019 4.20PM

Inference: Harmonics seems to be normal. No need of harmonic filters.

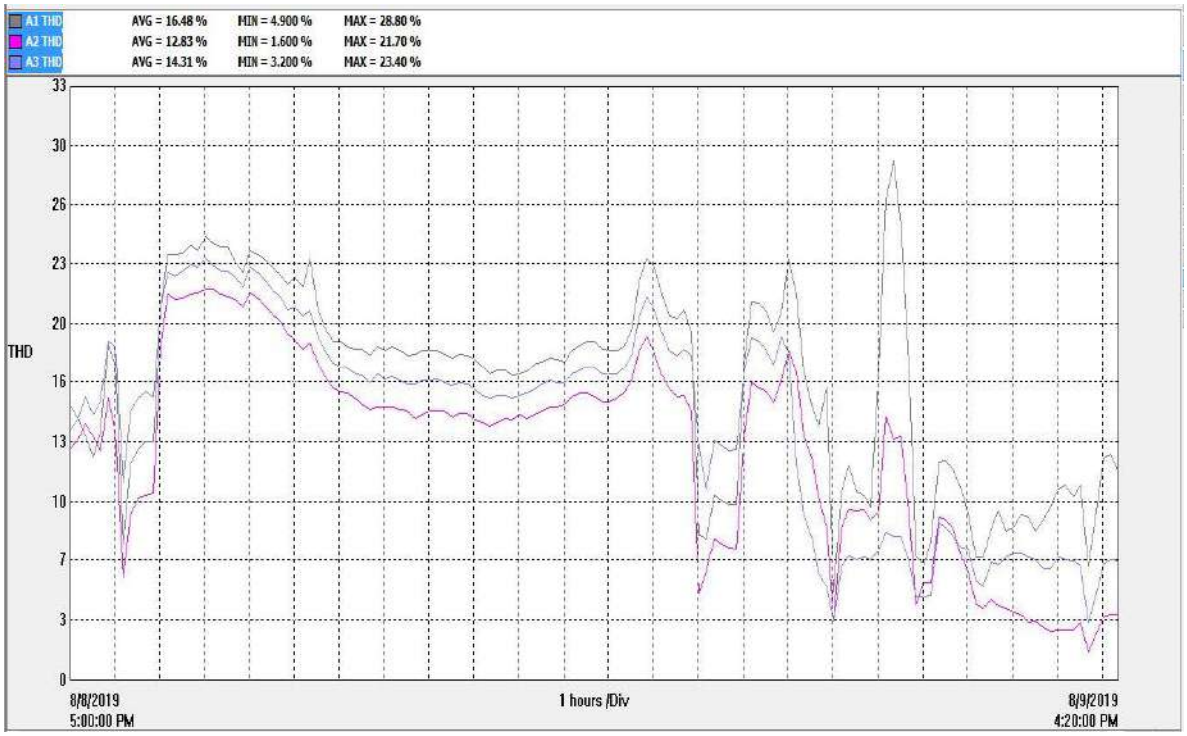


Fig.44 Shows the THD (voltage harmonics) for 24 hours from 8/8/2019 5.00PM to 9/8/2019 4.20PM

Inference: Harmonics seems to be normal. No need of harmonic filters.

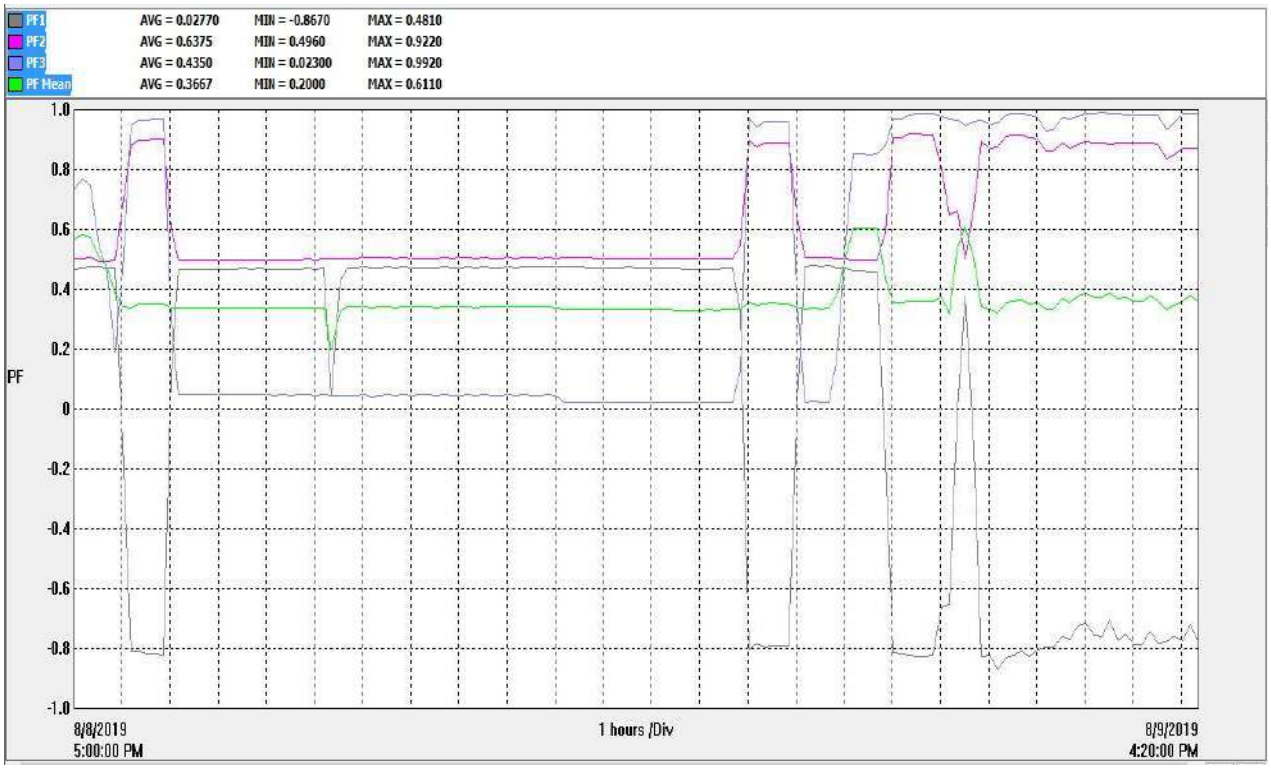


Fig.45 Shows the power factor (PF) for 24 hours from 8/8/2019 5.00PM to 9/8/2019 4.20PM
Inference: Unbalanced found here. Need to be improve the PF.

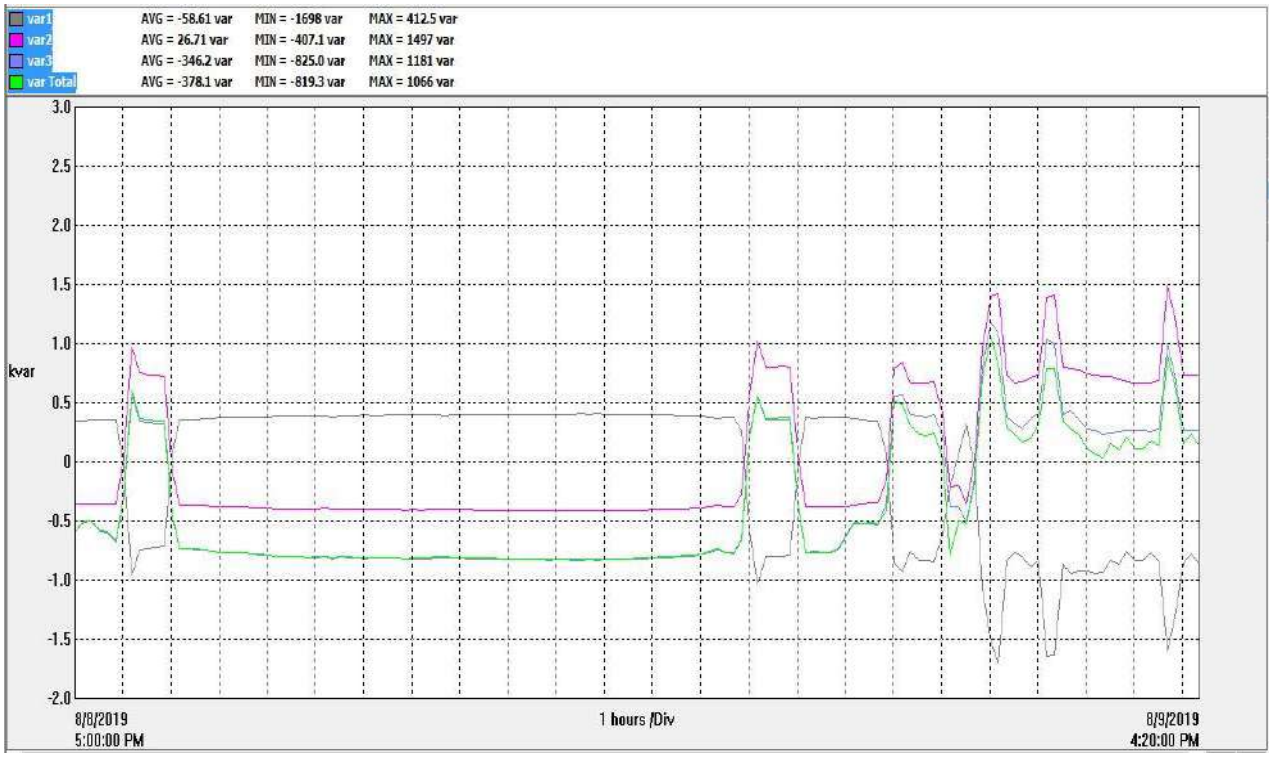


Fig.46 Shows the reactive power (kVAR) for 24 hours from 8/8/2019 5.00PM to 9/8/2019 4.20PM
Inference: Phase 1 & 2 shows very low KVAR compare to phase 3.

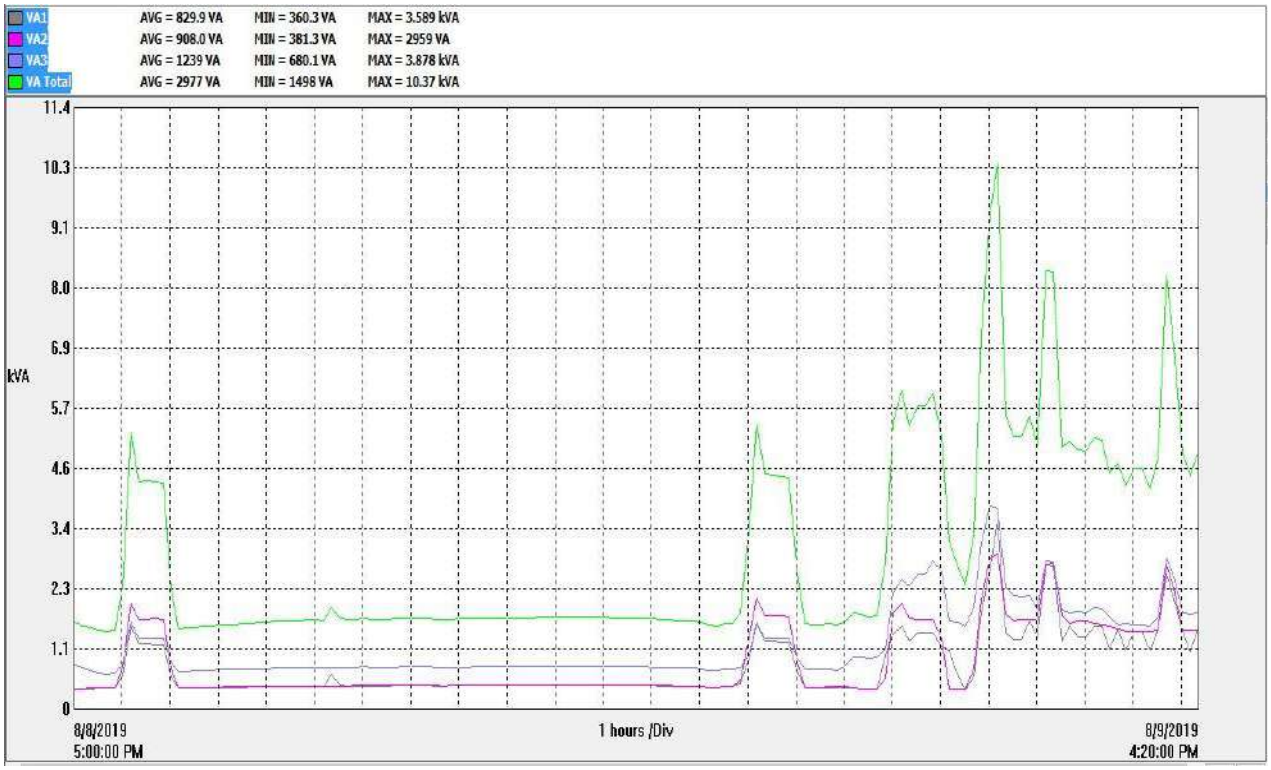


fig.47 Shows the power (kVA) for 24 hours from 8/8/2019 11.30AM to 9/8/2019 3.50PM
Inference: power distribution is unbalanced. Need to check electric connection.

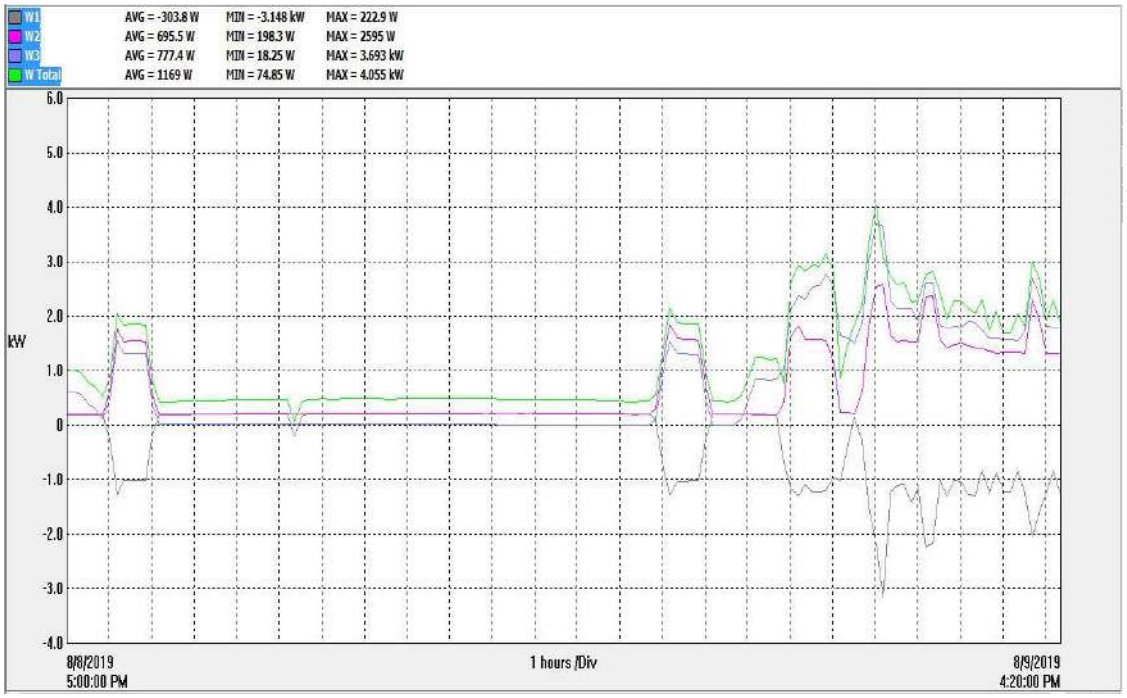


Fig.48 Shows the power (kW) for 24 hours from 8/8/2019 5.00PM to 39/8/2019 4.20PM
Inference: Power distribution is not balanced. Phase 1 is found to be Unbalance. It is loaded only 26% of the total.

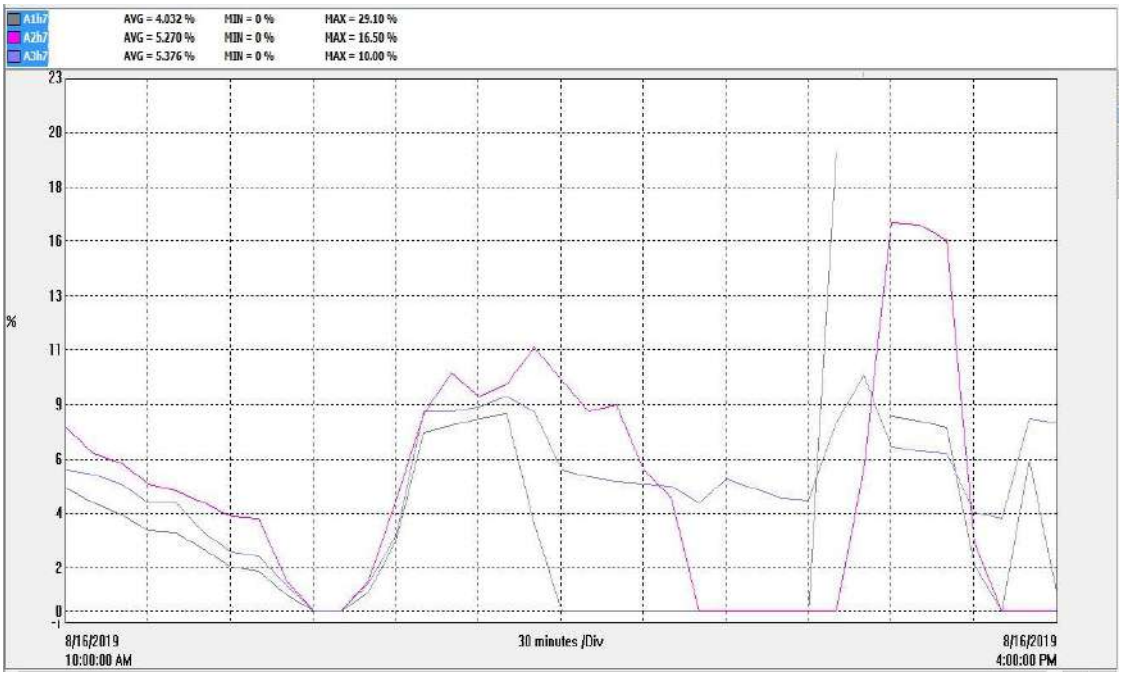


Fig.49 Shows the 7th order THD (voltage harmonics) for 6 hours from 16/8/2019 10.00PM to 16/8/2019 4.20PM

Inference: : Harmonics seems to be normal. No need of harmonic filters.

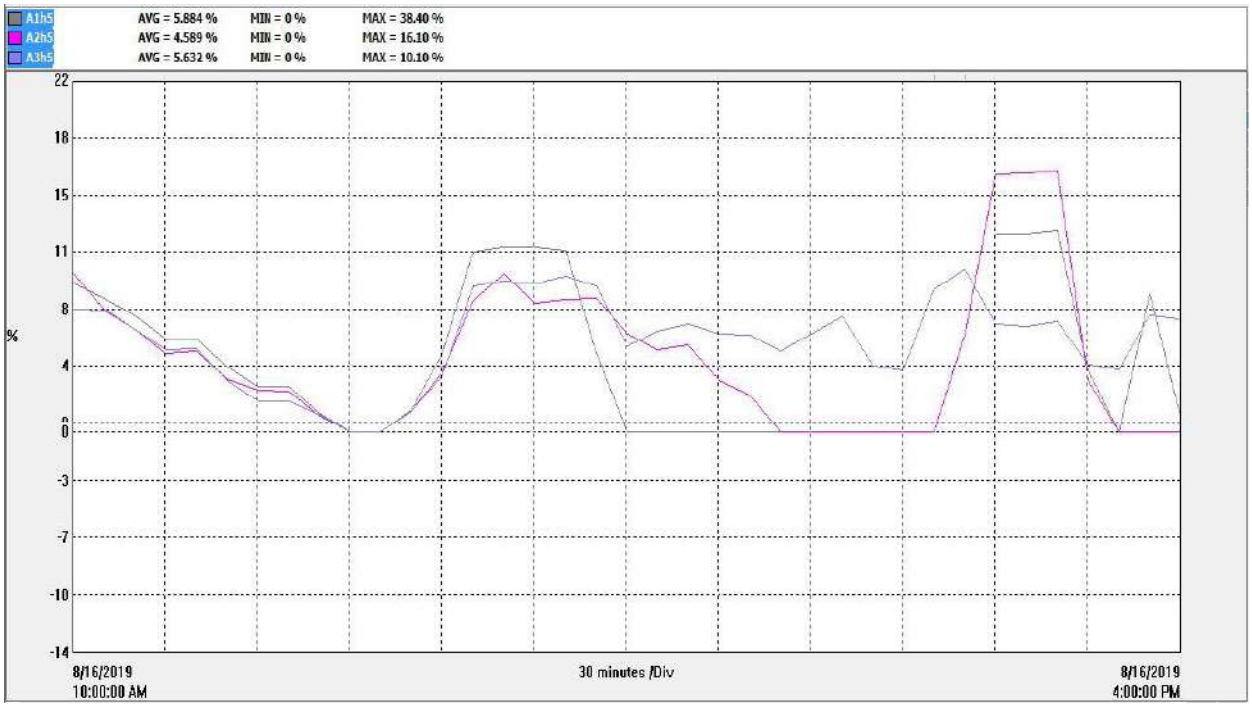


Fig.50 Shows the 5th order THD (voltage harmonics) for 6 hours from 16/8/2019 10.00PM to 16/8/2019 4.20PM

Inference: Harmonics seems to be normal. No need of harmonic filters.

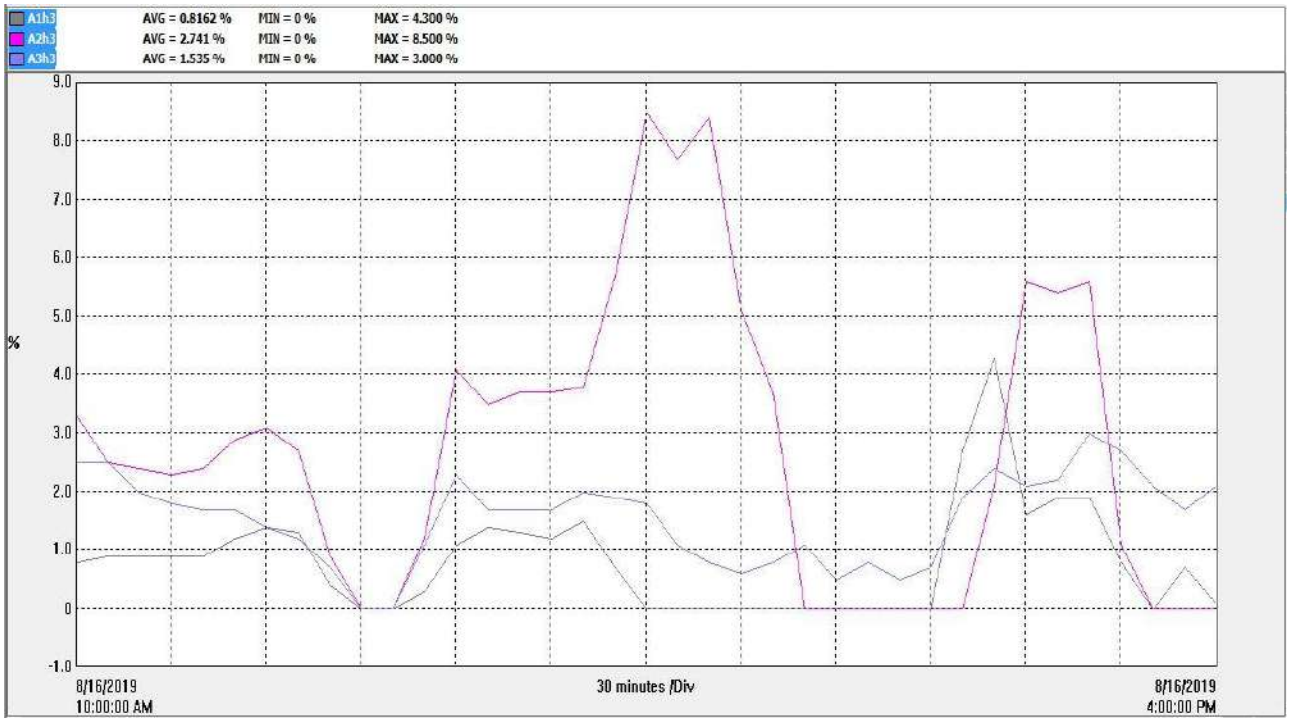


Fig.51 Shows the 3th order THD (voltage harmonics) for 6 hours from 16/8/2019 10.00PM to 16/8/2019 4.20PM

Inference: Harmonics seems to be normal. No need of harmonic filters.

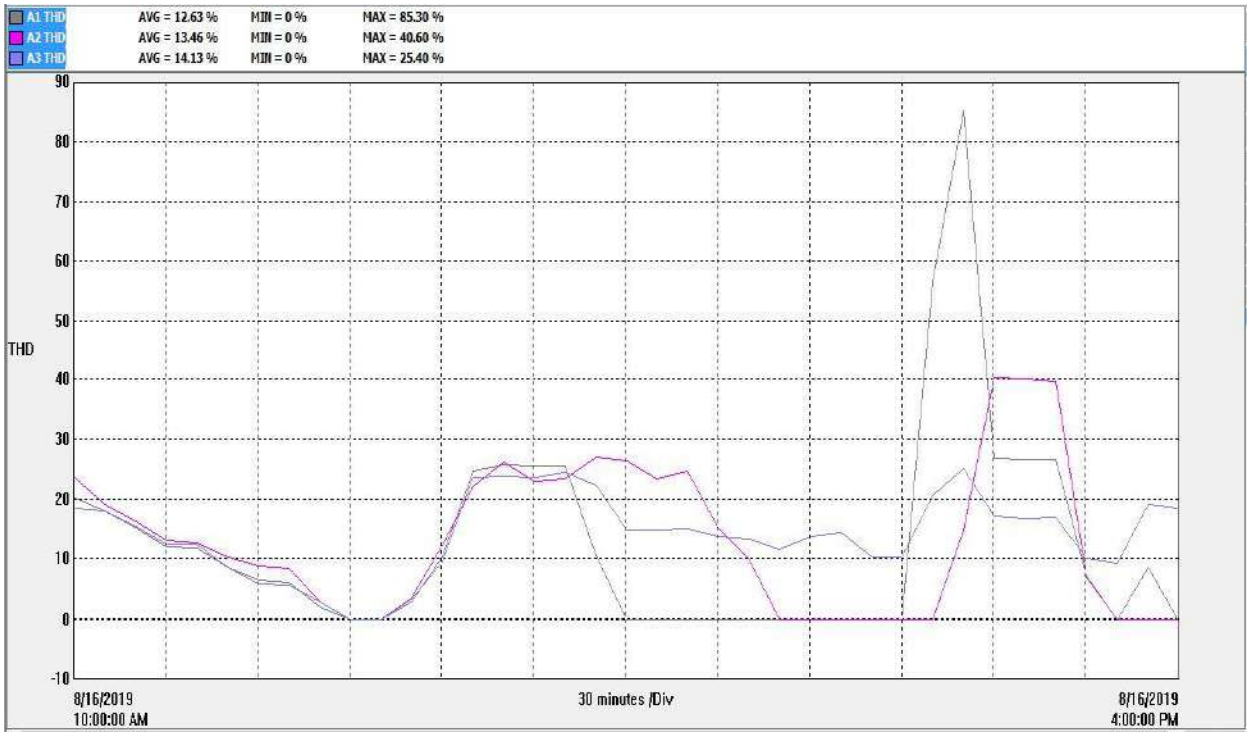


Fig.52 Shows the THD (voltage harmonics) for 6 hours from 16/8/2019 10.00PM to 16/8/2019 4.20PM

Inference: Harmonics seems to be normal. No need of harmonic filters.

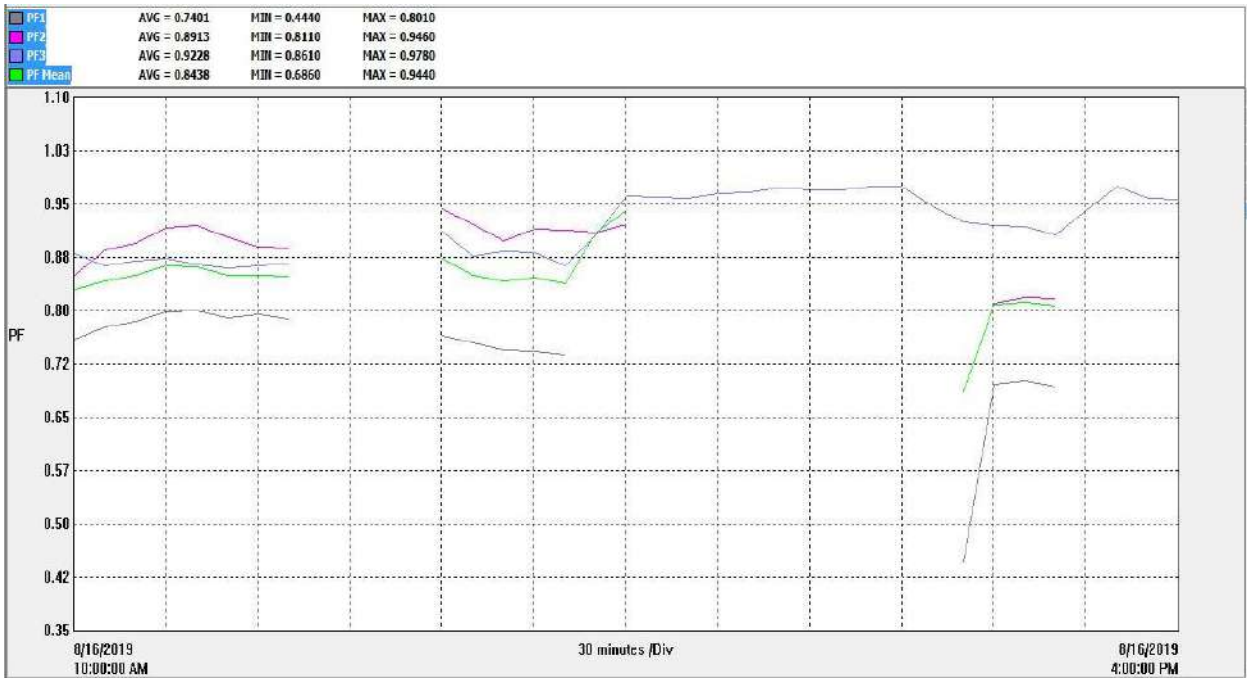


Fig.53 Shows the power factor (PF) for 6 hours from 16/8/2019 10.00PM to 9/8/2019 4.00PM
Inference: No unbalanced found here. Need to be improve the PF.

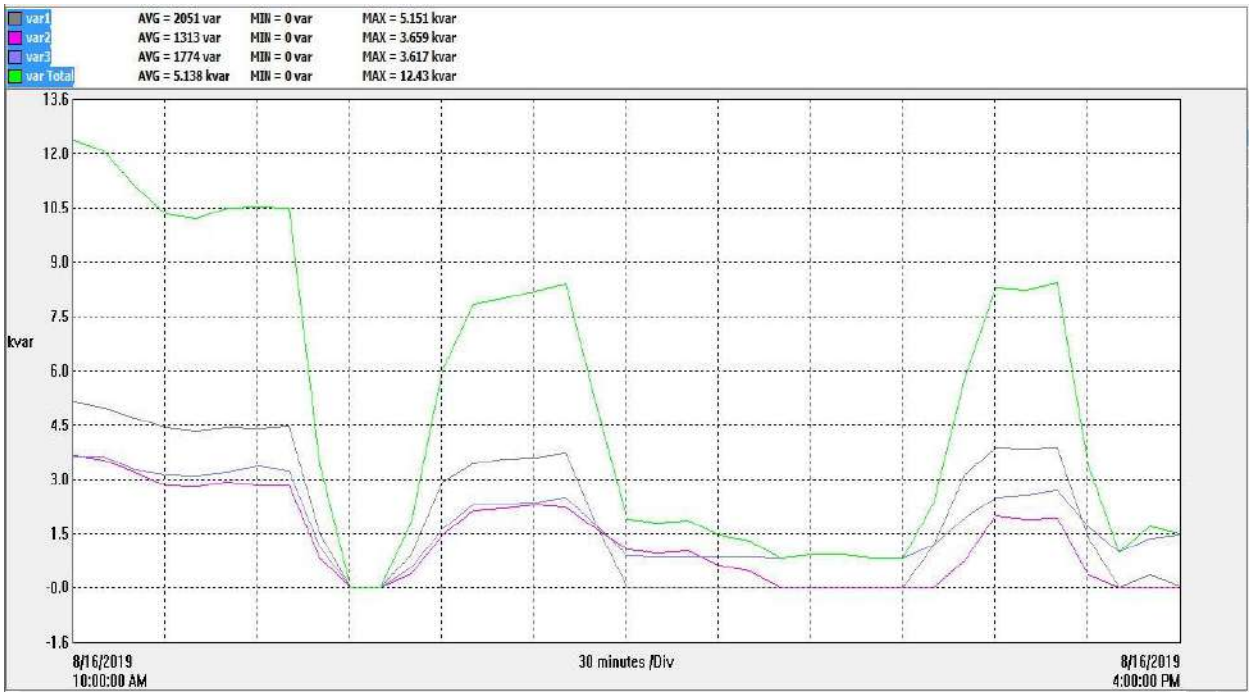


Fig.54 Shows the reactive power (kVAR) for 4 hours from 16/7/2019 10.00PM to 16/7/2019 4.00PM
Inference: Distribution is in balanced condition.

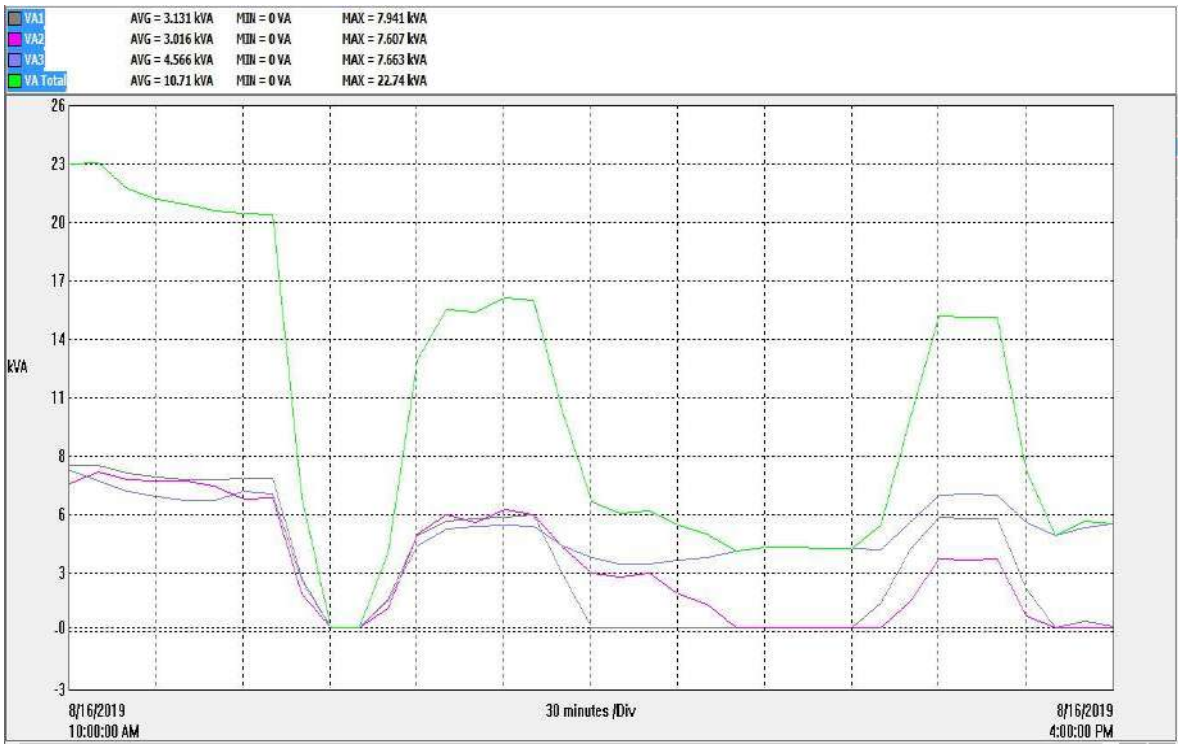


Fig.55 Shows the reactive power (kVAR) for 4 hours from 16/10/2019 10.00AM to 16/10/2019 4.00PM

Inference: KVAR seems to be normal.

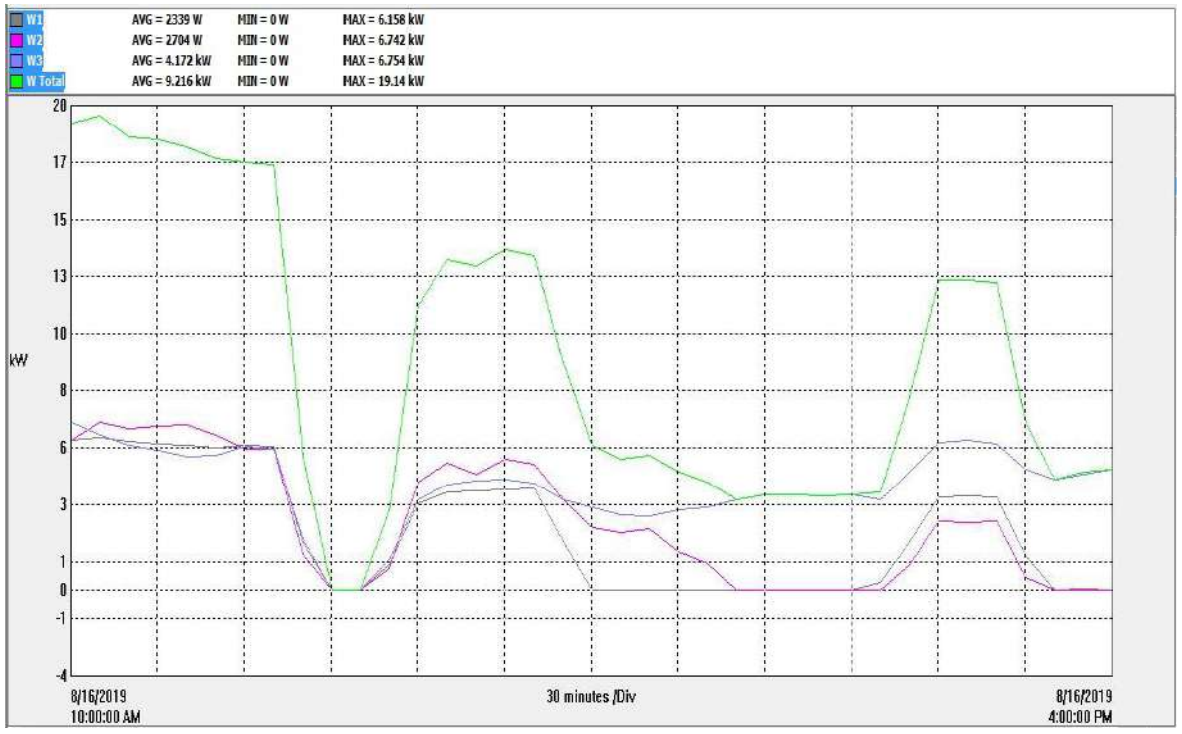


Fig.56 Shows the power (kW) for 6 hours from 16/8/2019 10.00PM to 16/8/2019 4.00PM

Inference: Power distribution is balanced.

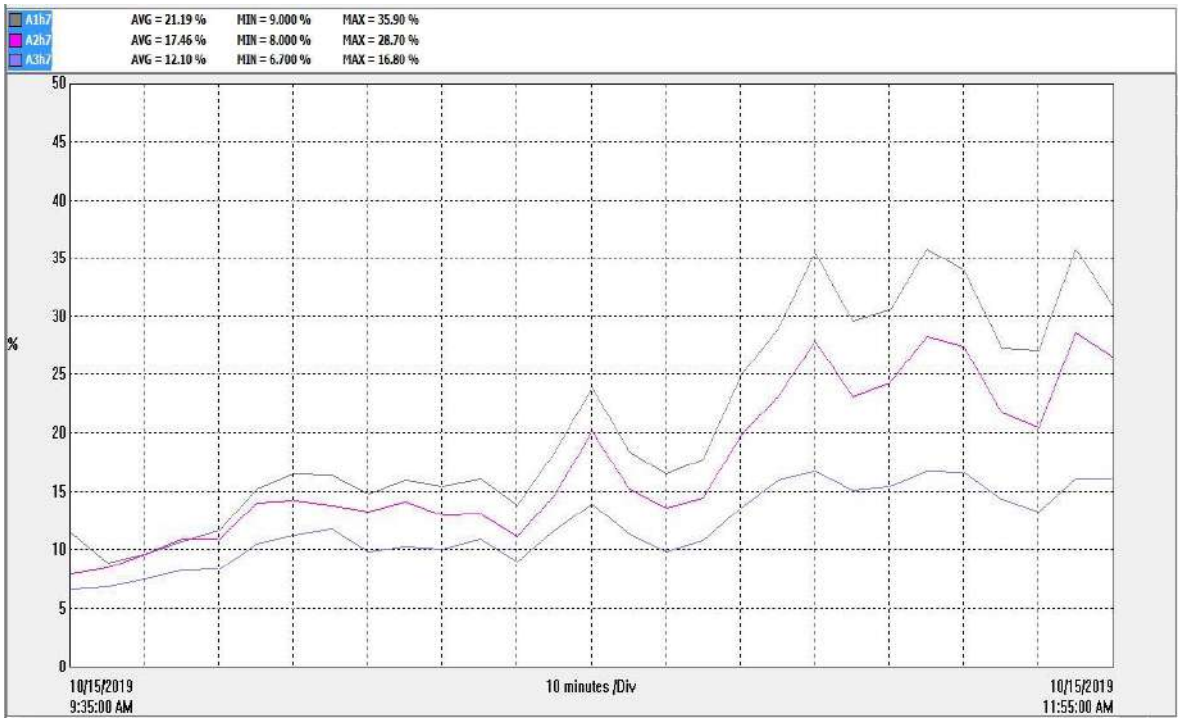


Fig.57 Shows the 7th order THD (voltage harmonics) for 2.30 hours from 15/10/2019 9.35AM to 15/10/2019 11.55 AM

Inference: As THD is high, it is recommended to have harmonic filter as preventive measure against equipment failures.

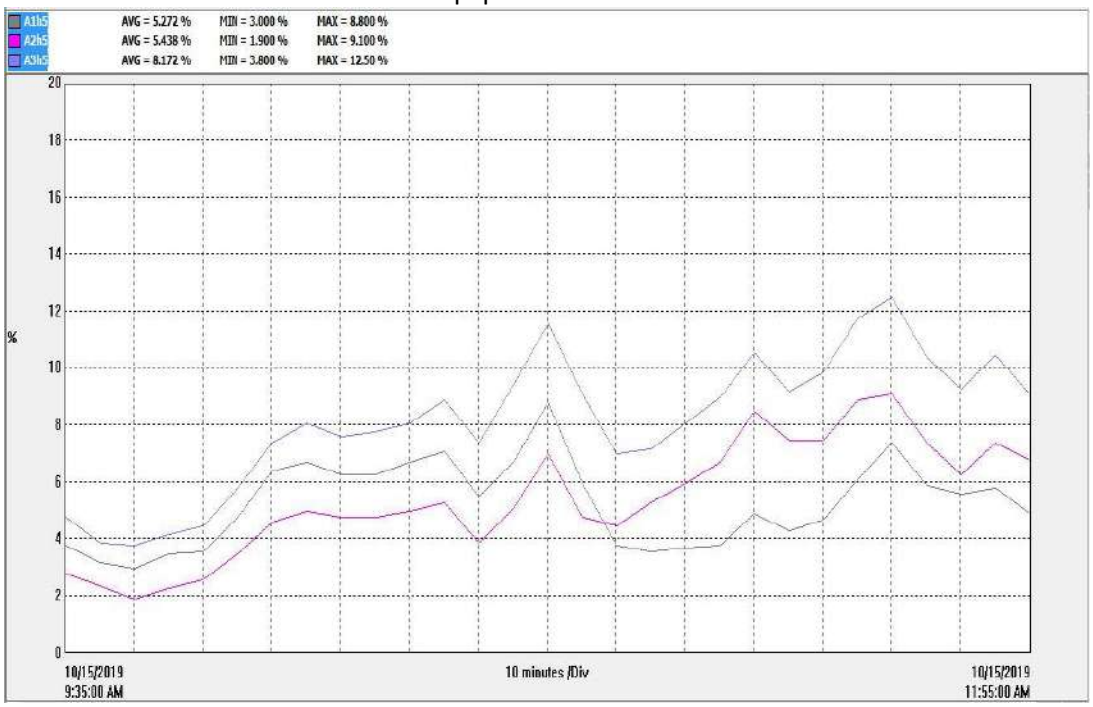


Fig.58 Shows the 5th order THD (voltage harmonics) for 2.30 hours from 15/10/2019 9.30PM to 15/10/2019 11.55PM

Inference: Harmonics seems to be normal. No need of harmonic filters.

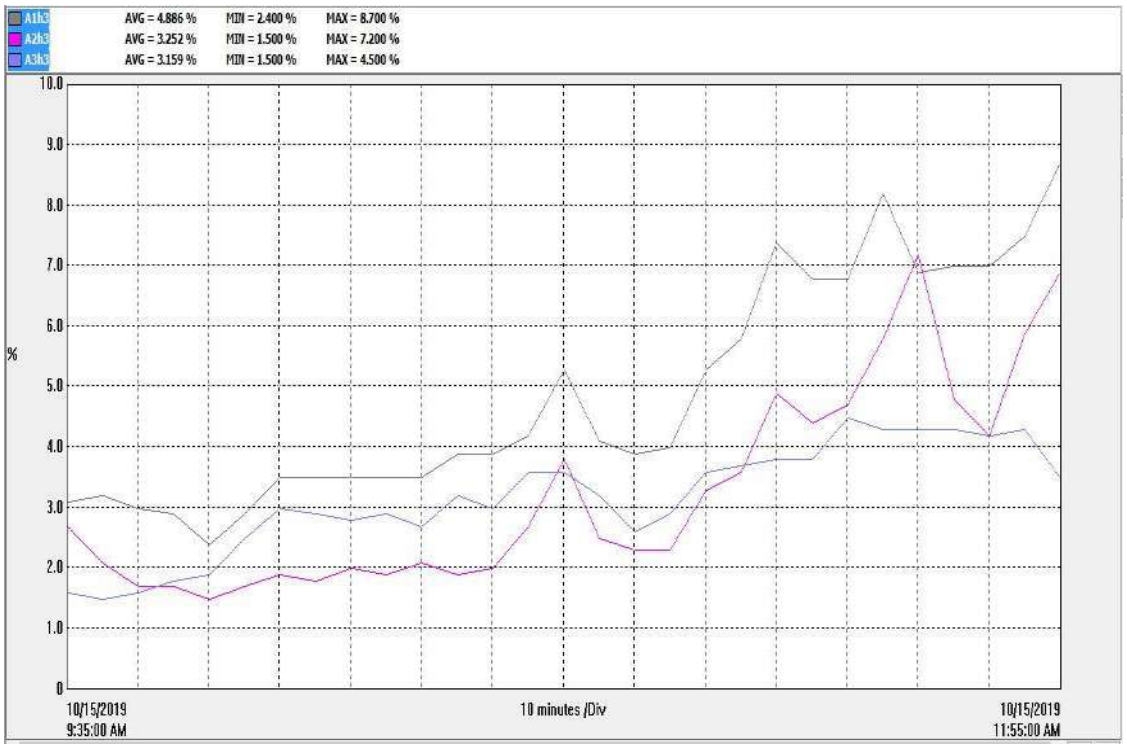


Fig.59 Shows the 3th order THD (voltage harmonics) for 2.30 hours from 15/10/2019 9.35AM to 15/10/2019 11.55AM

Inference: Harmonics seems to be normal. No need of harmonic filters.

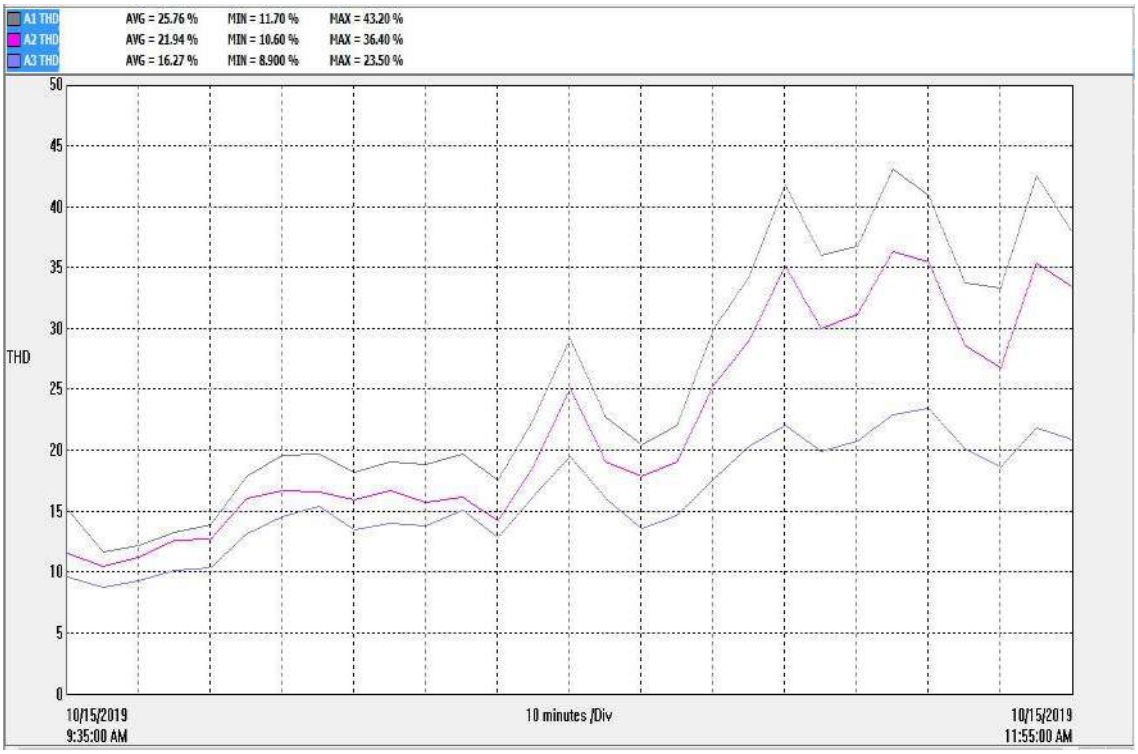


Fig.60 Shows the THD (voltage harmonics) for 2.30 hours from 15/10/2019 9.35AM to 15/10/2019 11.55AM

Inference: As THD is high, it is recommended to have harmonic filter as preventive measure against equipment failures.

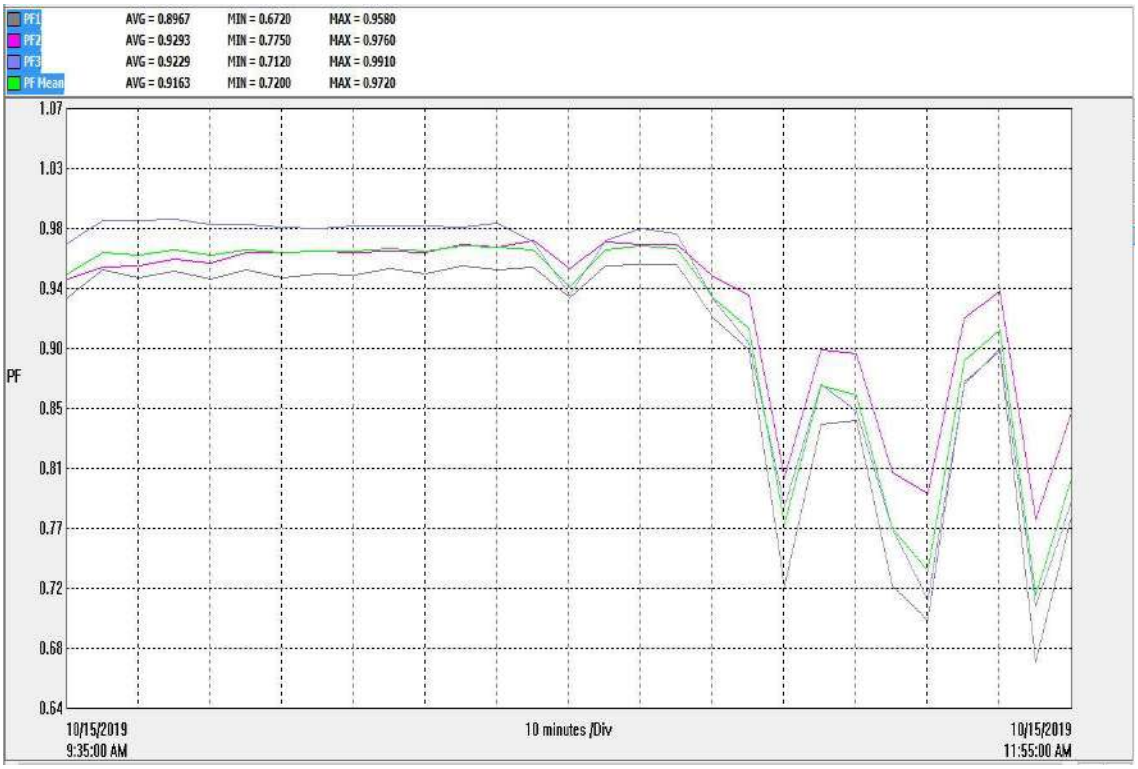


Fig.61 Shows the power factor (PF) for 2.30 hours from 15/10/2019 9.35AM to 15/10/2019 4.00PM
Inference: No unbalanced found here. Need to be improve the PF.

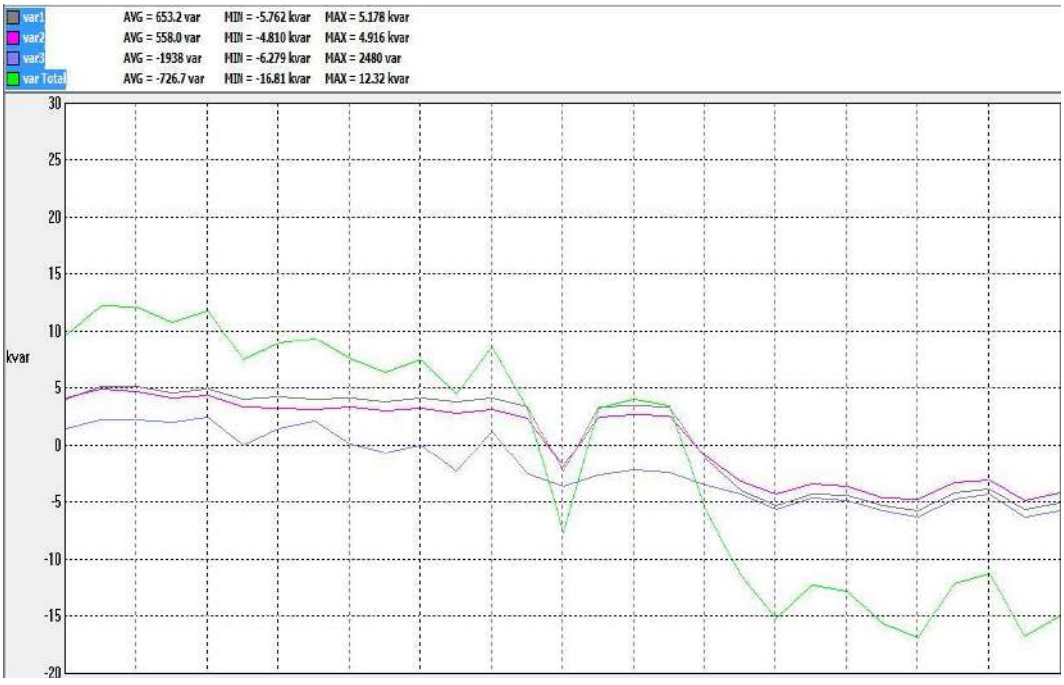


Fig.62 Shows the reactive power (kVAR) for 4 hours from 8/8/2019 5.00PM to 9/8/2019 4.20PM
Inference: Phase 3 shows very low KVAR compare to other two phases. Need to be check.

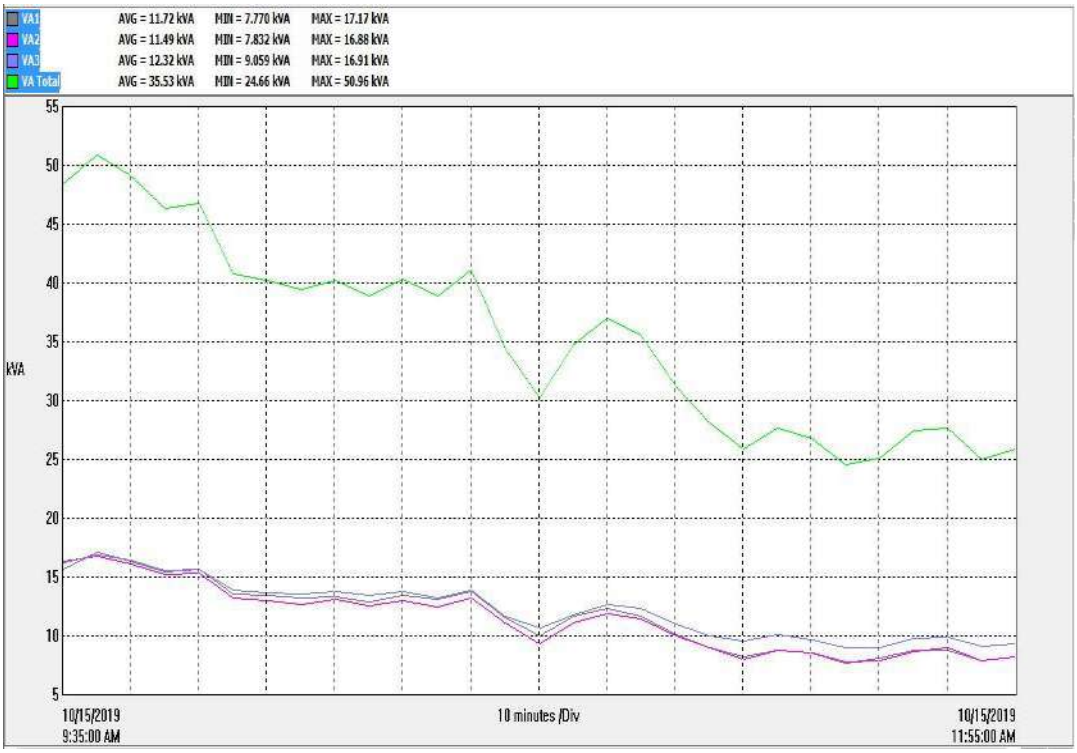


Fig.63 Shows the reactive power (kVA) for 2.30 hours from 15/10/2019 9.35AM to 15/10/2019 11.55PM

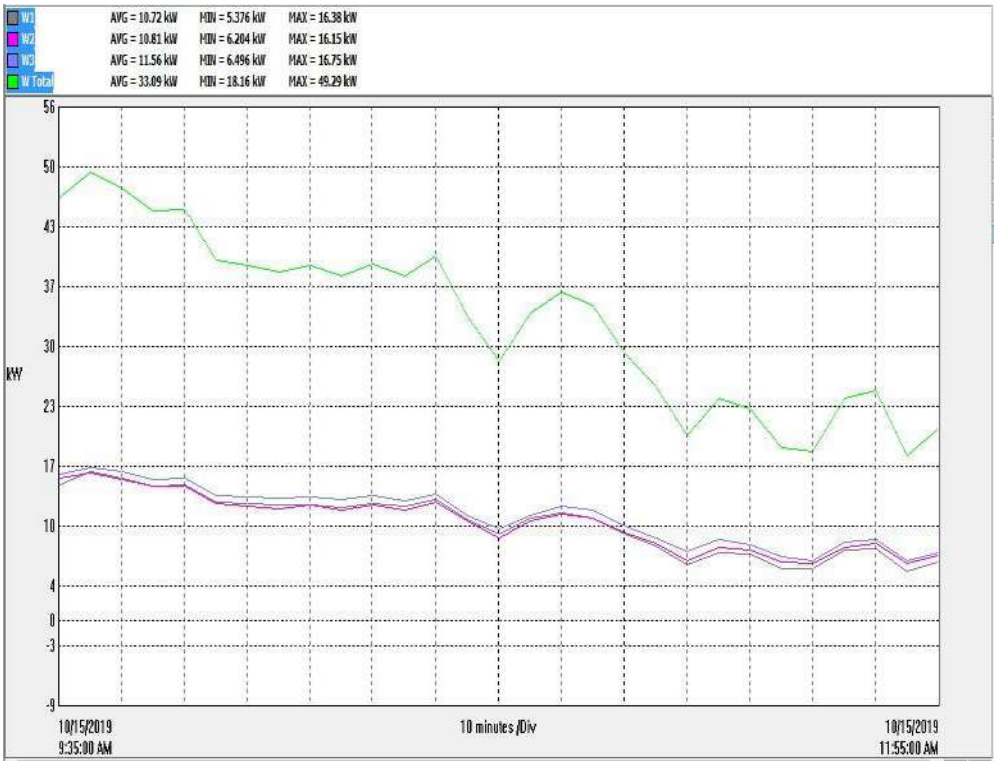


Fig.64 Shows the power (kW) for 2.30 hours from 15/10/2019 9.35PM to 15/10/2019 11.55PM
Inference: power distribution is in balanced condition.

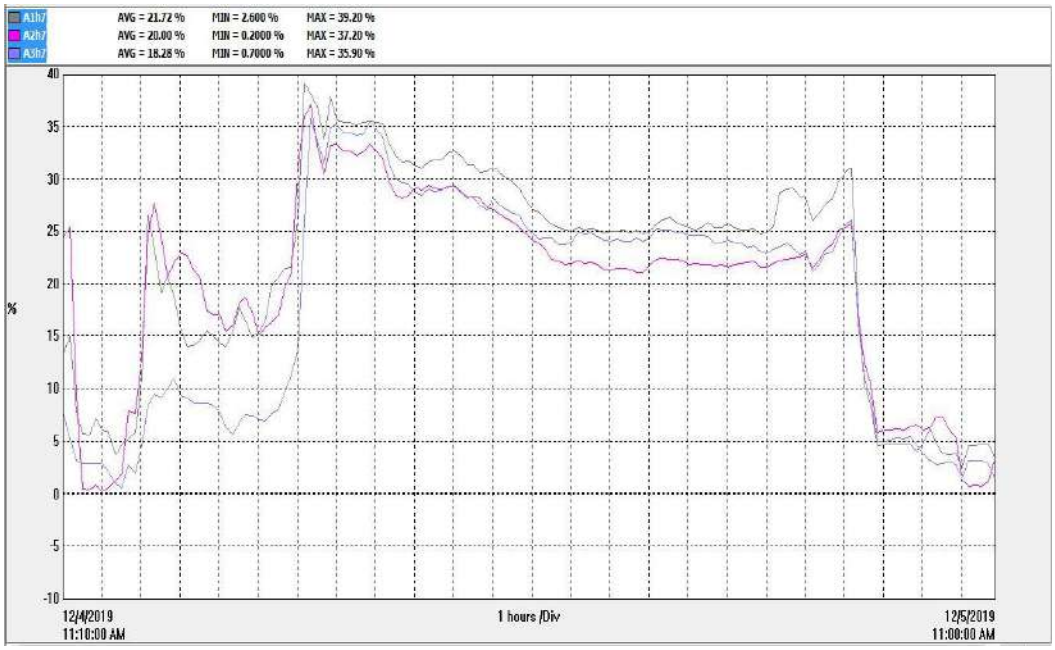


Fig.65 Shows the 7th order THD (voltage harmonics) for 24 hours from 4/12/2019 11.00AM to 5/12/2019 11.00AM

Inference: As THD is high, it is recommended to have harmonic filter as preventive measure against equipment failures.

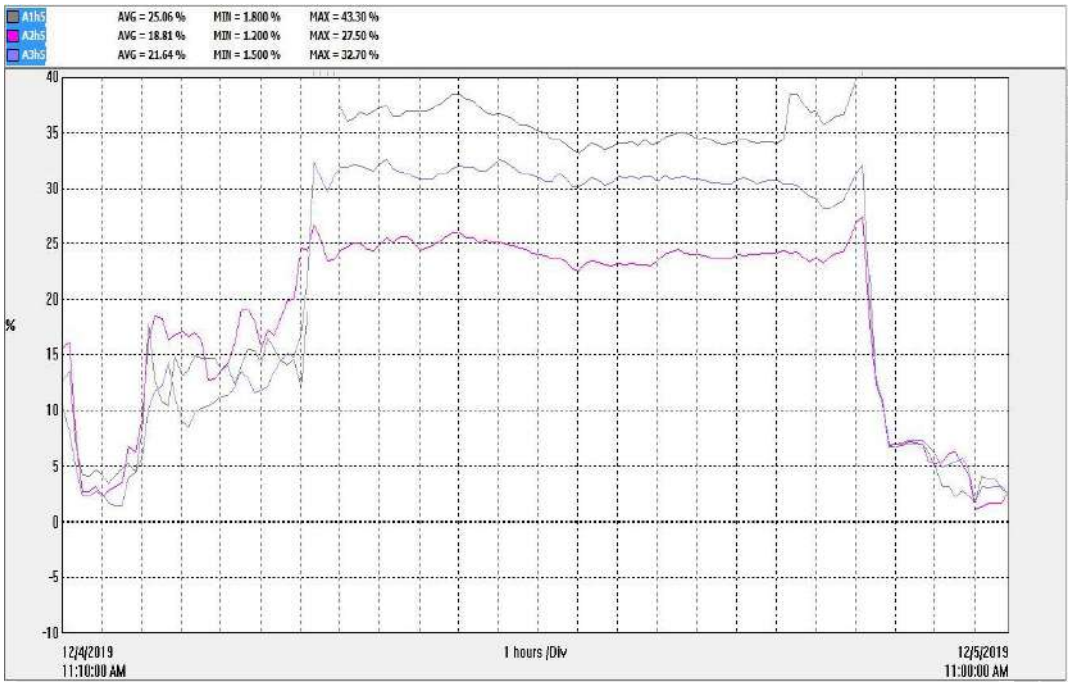


Fig.66 Shows the 5th order THD (voltage harmonics) for 24 hours from 4/12/2019 11.00AM to 5/12/2019 11.00AM

Inference: As THD is high, it is recommended to have harmonic filter as preventive measure against equipment failures.

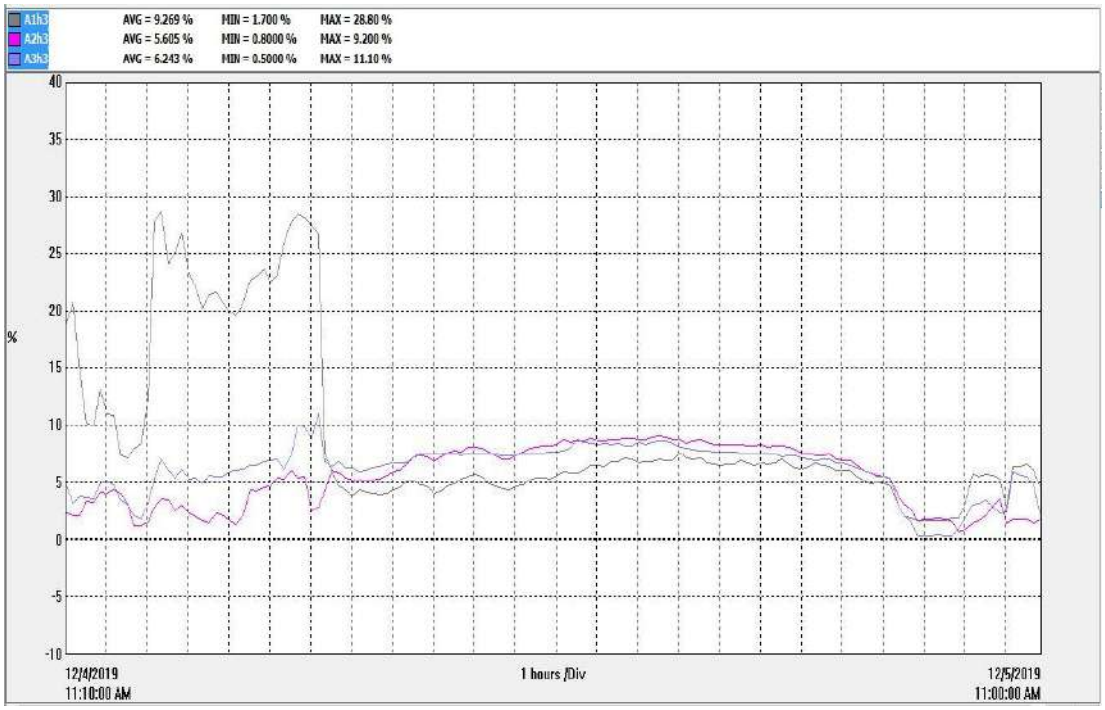


Fig.67 Shows the 3th order THD (voltage harmonics) for 24 hours from 4/12/2019 11.10AM to 5/12/2019 11.00AM

Inference: Harmonics seems to be normal. No need of harmonic filters.

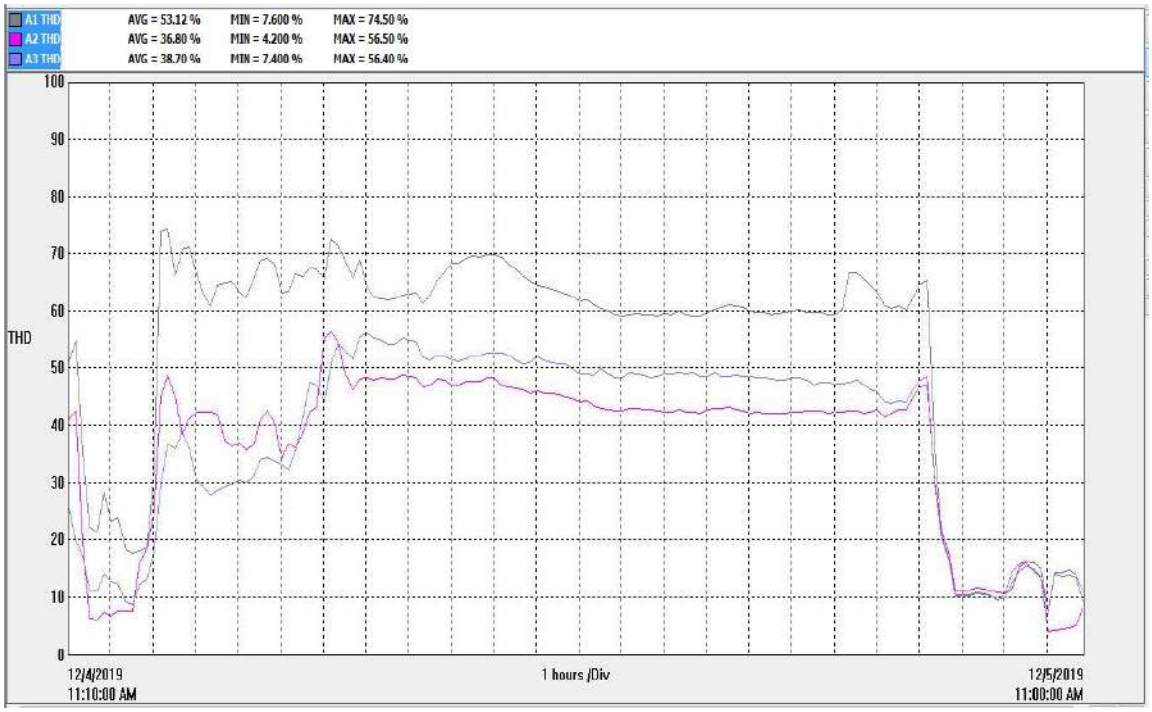


Fig.68 Shows the THD (voltage harmonics) for 24 hours from 4/12/2019 11.00AM to 5/12/2019 11.00AM

Inference: As THD is high, it is recommended to have harmonic filter as preventive measure against equipment failures.

Fig.69 Shows the power factor (PF) for 24 hours from 4/12/2019 11.00AM to 5/12/2019 11.00PM

Inference: unbalance found in Phase 2. Need to improve PF.

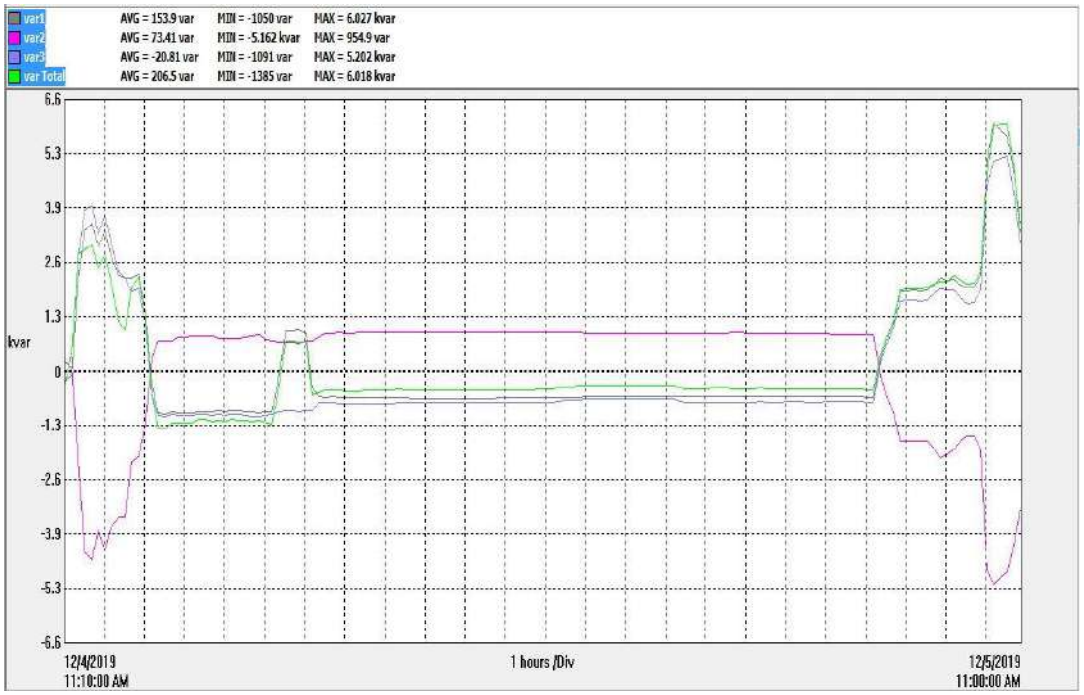


Fig.70 Shows the reactive power (kVAR) for 24 hours from 4/12/2019 11.10AM to 5/12/2019 11.20AM

Inference: kVAR distribution in each phases are in abnormal condition. Need to check the connection.

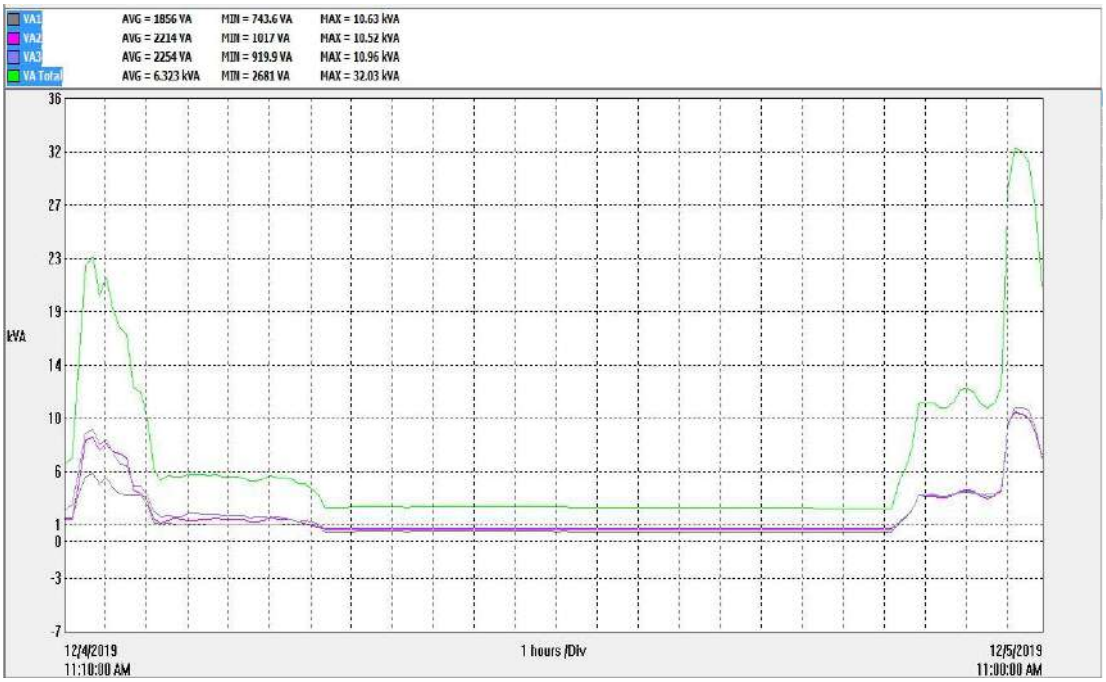


Fig.71 Shows the reactive power (kVA) for 24 hours from 4/12/2019 11.10AM to 5/12/2019 11.00AM

Inference: Phase 1 shows low KVA value than other two phases.

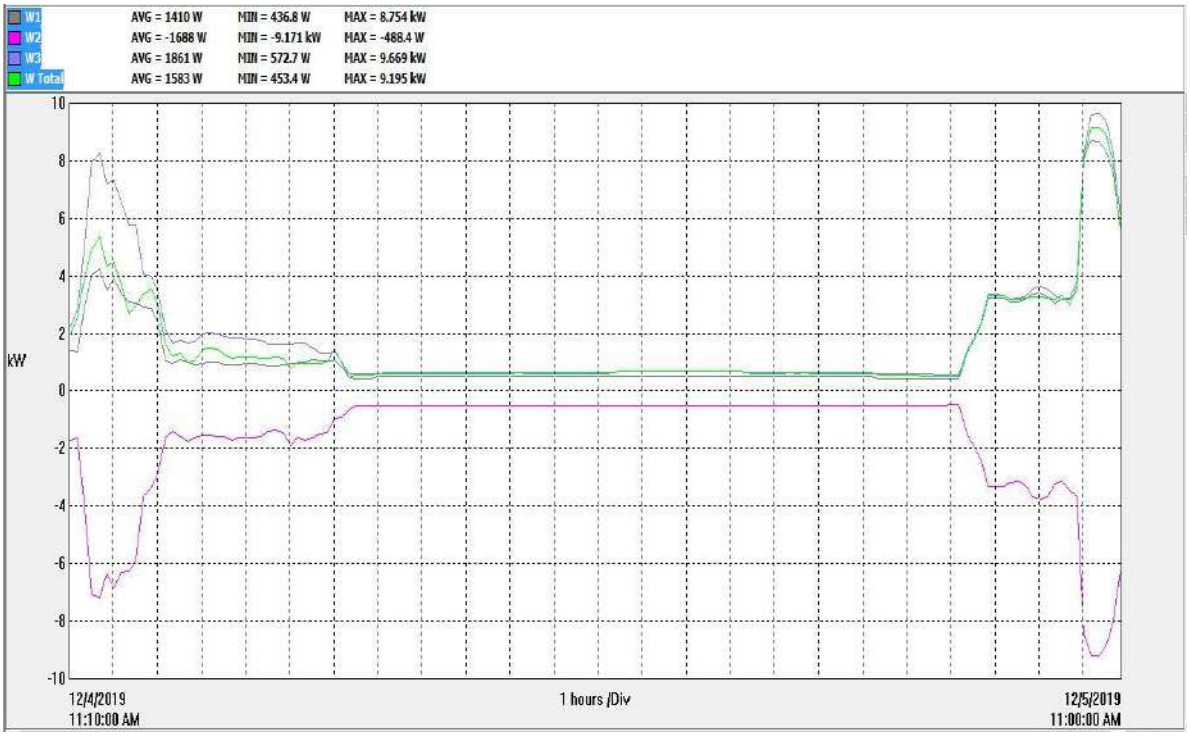


Fig.72 Shows the power (kW) for 24 hours from 4/12/2019 11.10AM to 5/12/2019 11.00AM

Inference: power distribution is in unbalanced condition. Phase 2 shows abnormal value. Need to be check the connection.

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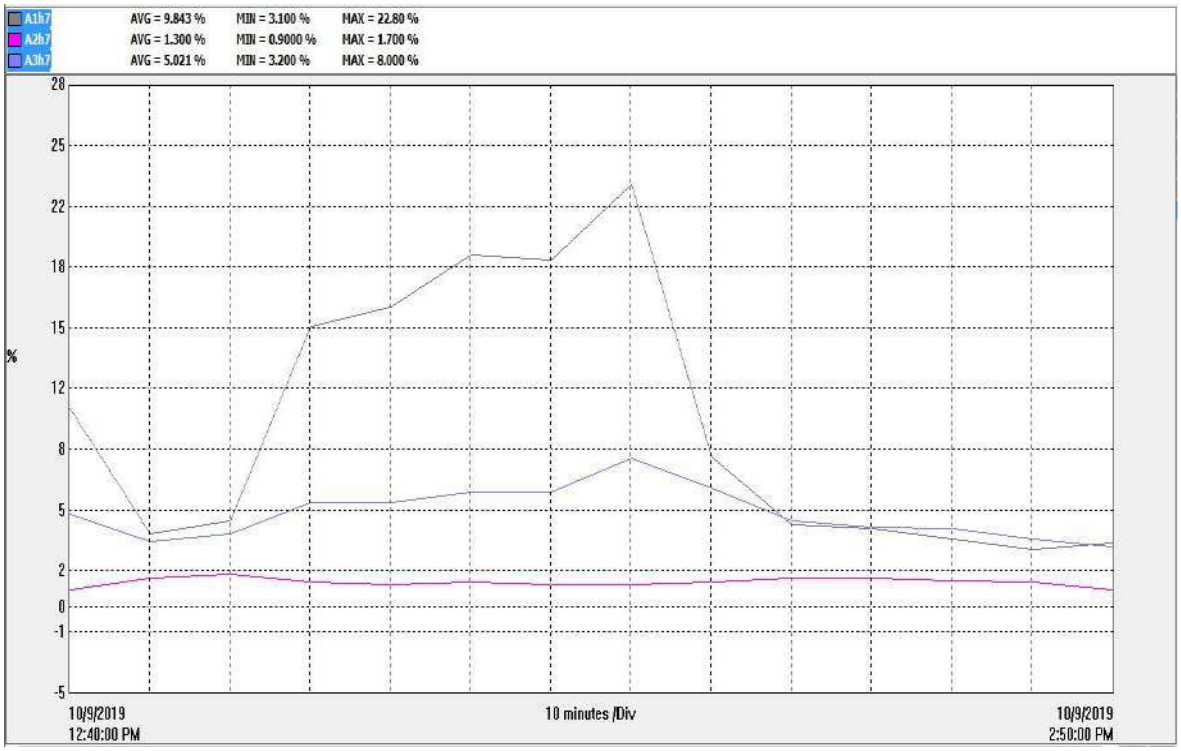

Fig.73 Shows the 7th order THD (voltage harmonics) for 2.30 hours from 9/10/2019 12.40PM to 9/10/2019 2.50PM

Inference: Harmonics seems to be normal. No need of harmonic filters.

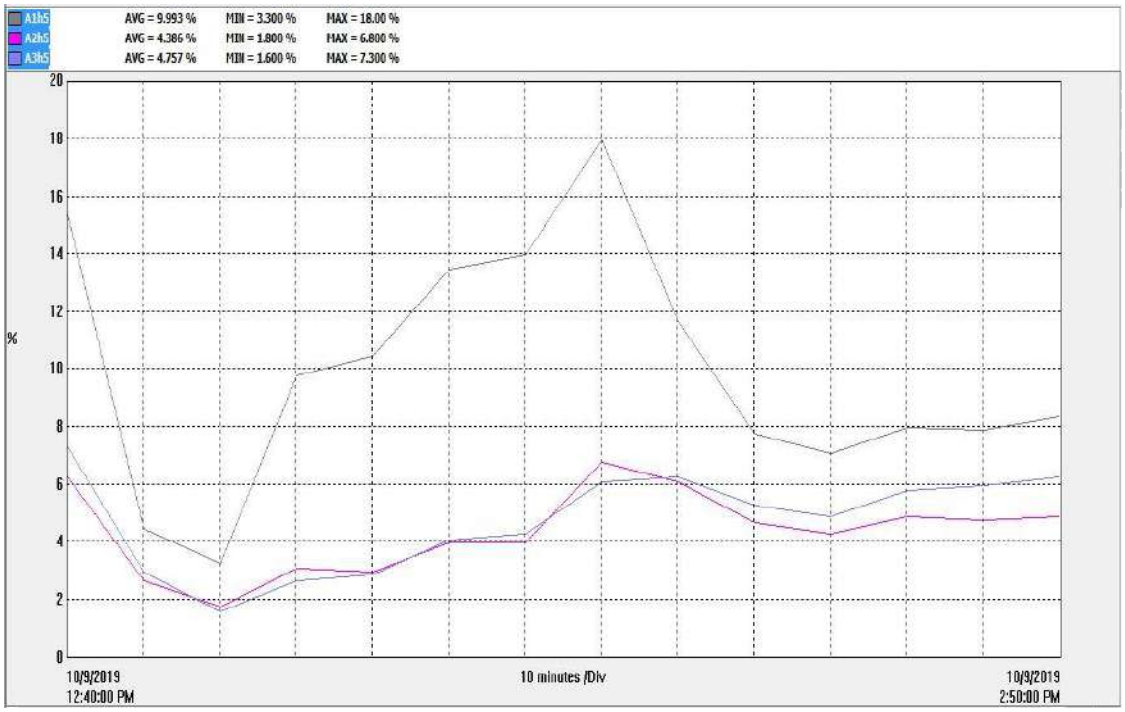

Fig.74 Shows the 5th order THD (voltage harmonics) for 2.30 hours from 9/10/2019 12.40PM to 9/10/2019 2.50PM

Inference: Harmonics seems to be normal. No need of harmonic filters.

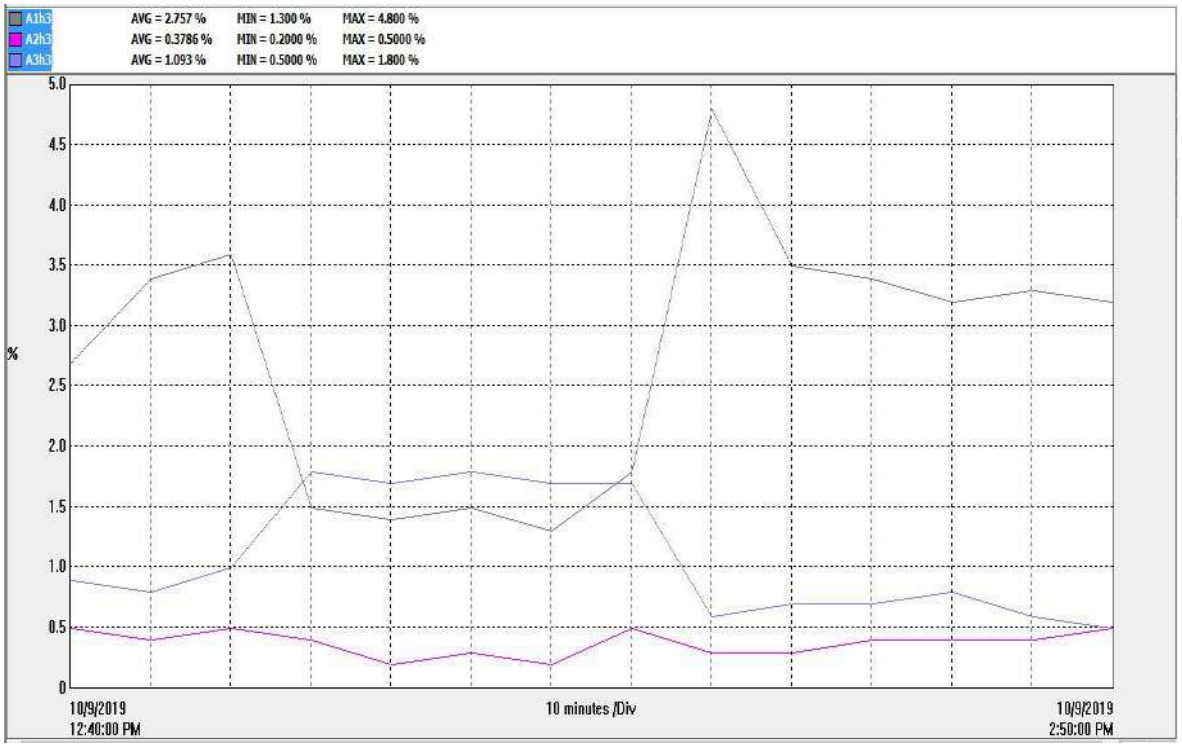

Fig.75 Shows the 3th order THD (voltage harmonics) for 2.30 hours from 9/10/2019 12.40PM to 9/10/2019 2.50PM

Inference: Harmonics seems to be normal. No need of harmonic filters.

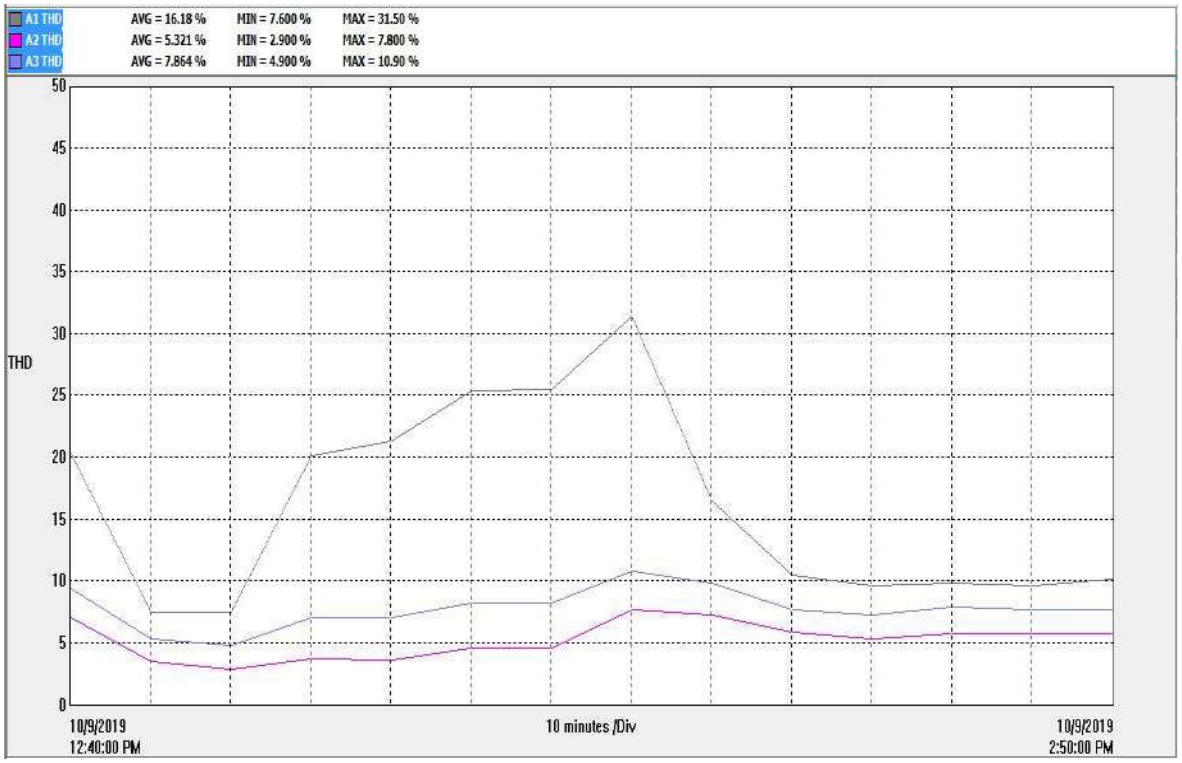

Fig.76 Shows the THD (voltage harmonics) for 2.30 hours from 9/10/2019 12.40PM to 9/10/2019 2.50PM

Inference: Harmonics seems to be normal. No need of harmonic filters.

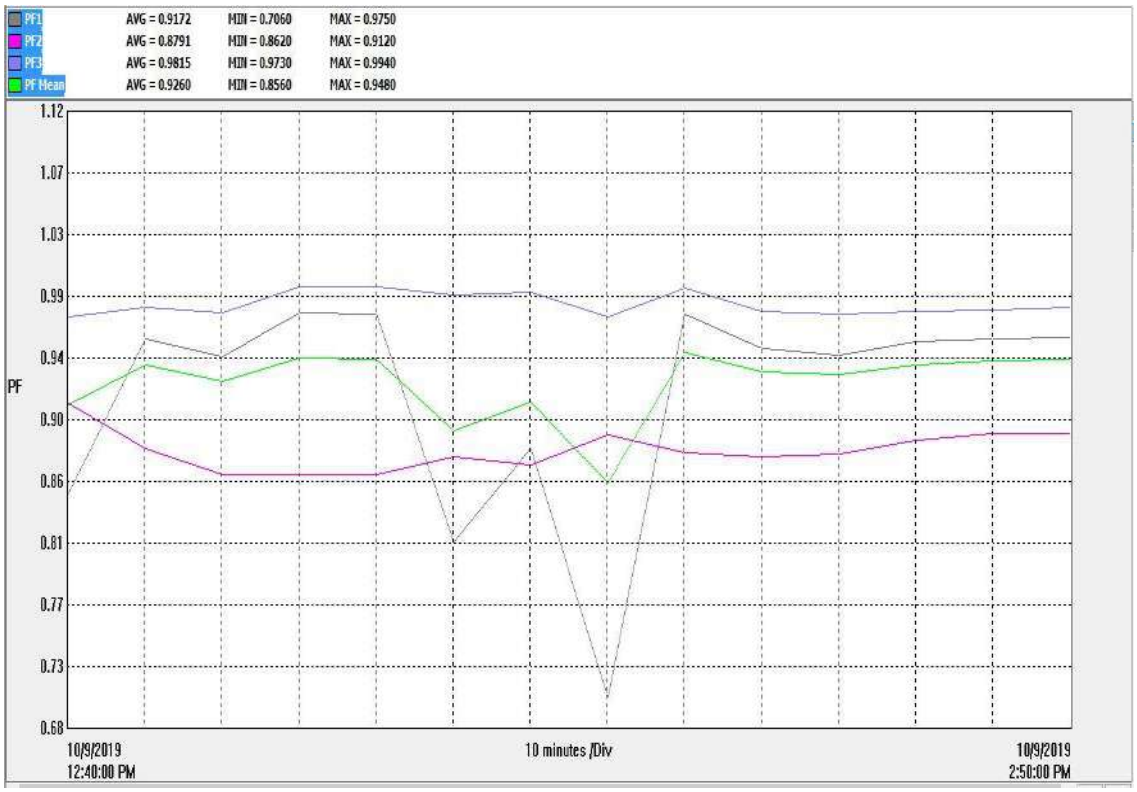

Fig.77 Shows the power factor (PF) for 2.30 hours from 9/10/2019 12.40PM to 9/10/2019 2.50PM

Inference: No unbalanced found here. Need to be improve the PF.

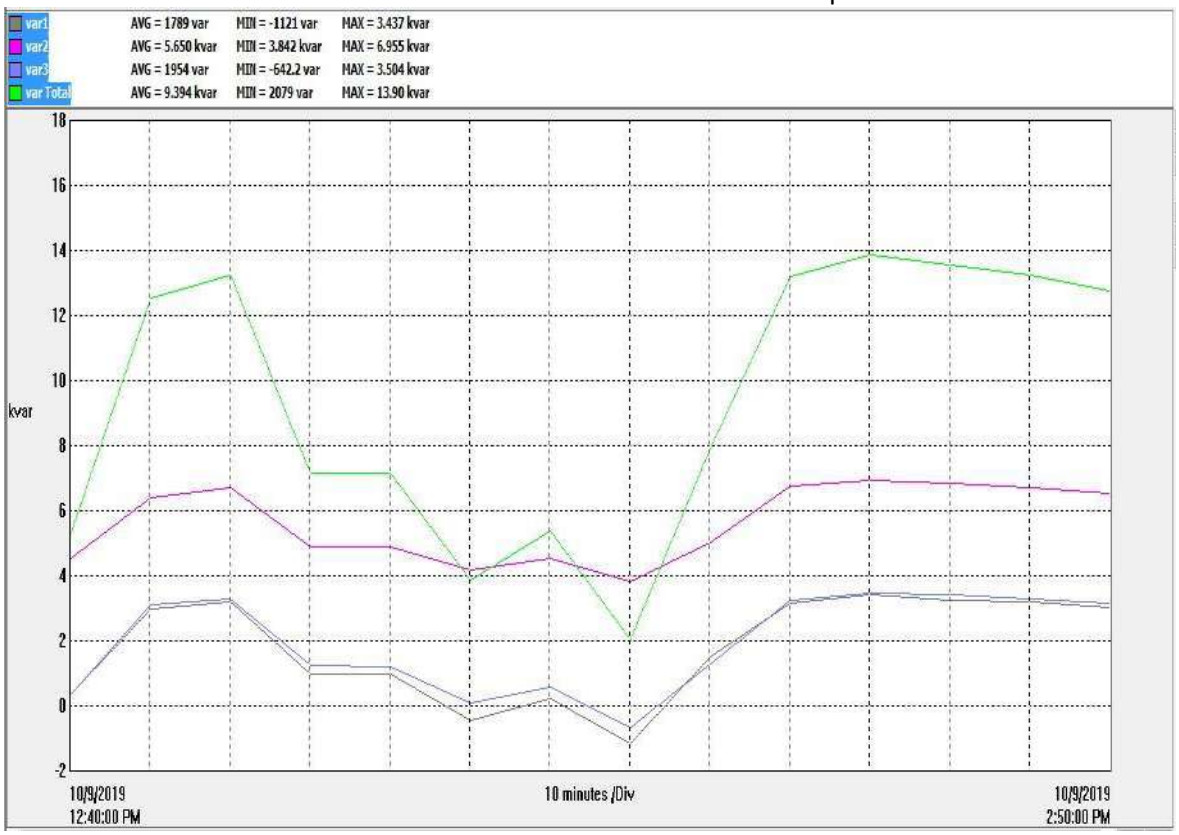

Fig.78 Shows the reactive power (kVAR) for 2.30 hours from 9/10/2019 12.40PM to 9/10/2019 2.50PM

Inference: Phase 2 shows higher value than other two phases.

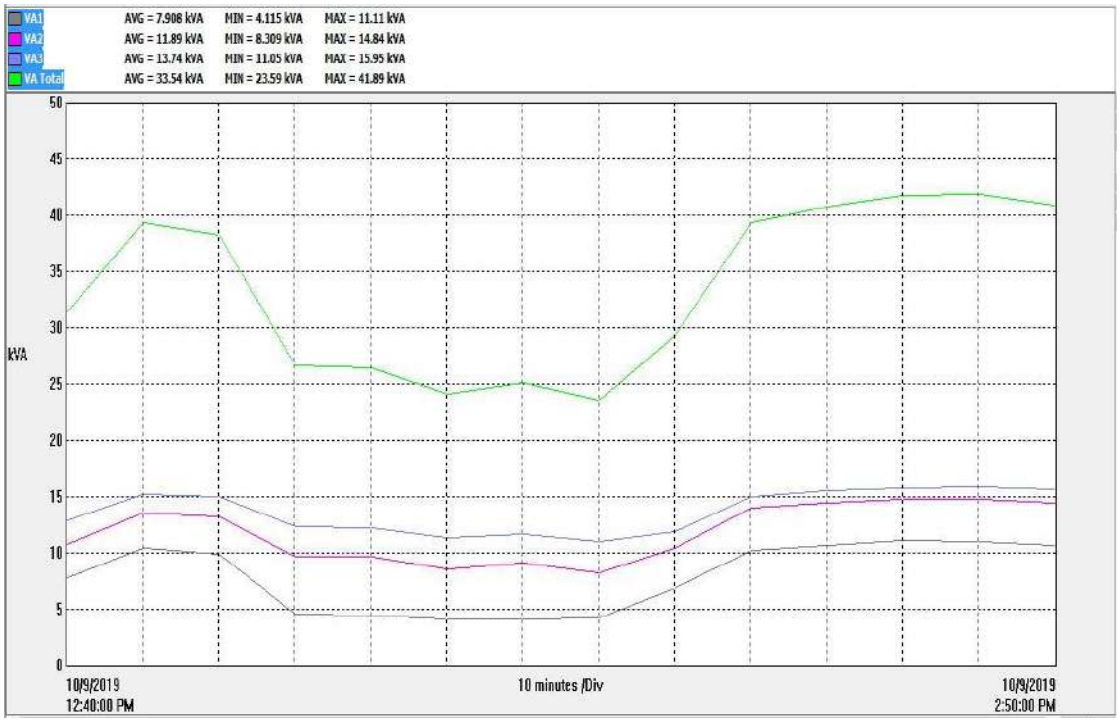

Fig.79 Shows the reactive power (kVAR) for 2.30 hours from 9/10/2019 12.40PM to 9/10/2019 2.50PM

Inference: Phase 3 shows higher kVA than other two phases.

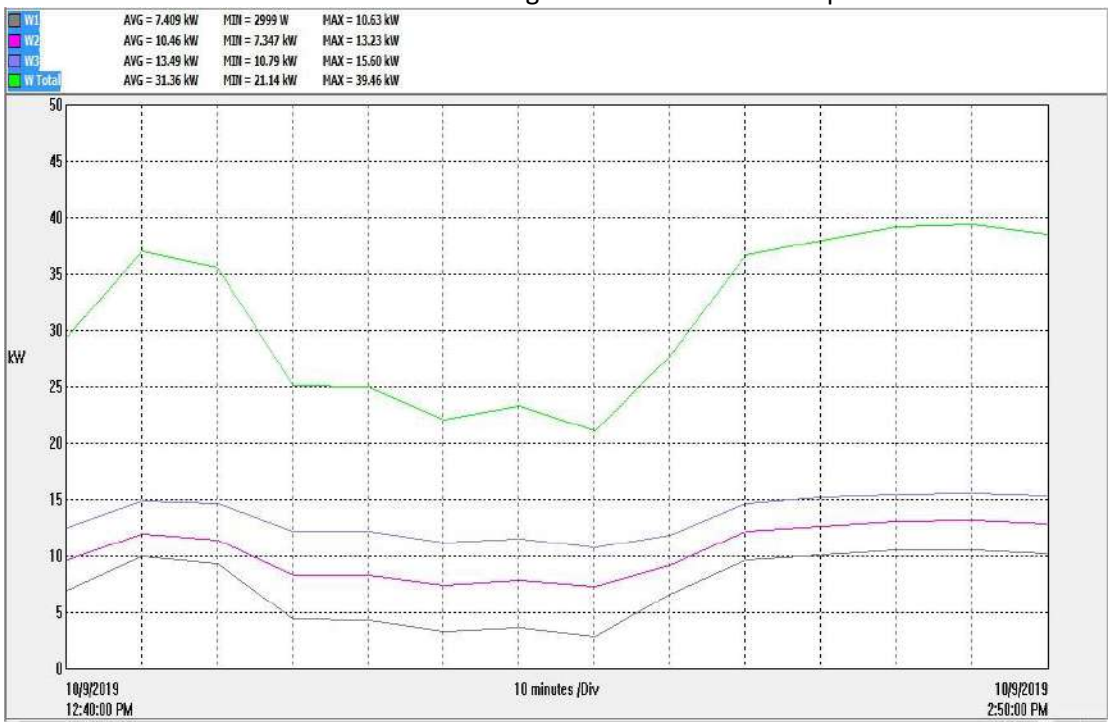

Fig.80 Shows the power (kW) for 2.30 hours from 9/10/2019 12.40PM to 9/10/2019 2.50PM

Inference: Power distribution is not balanced. Phase 1 shows low value.

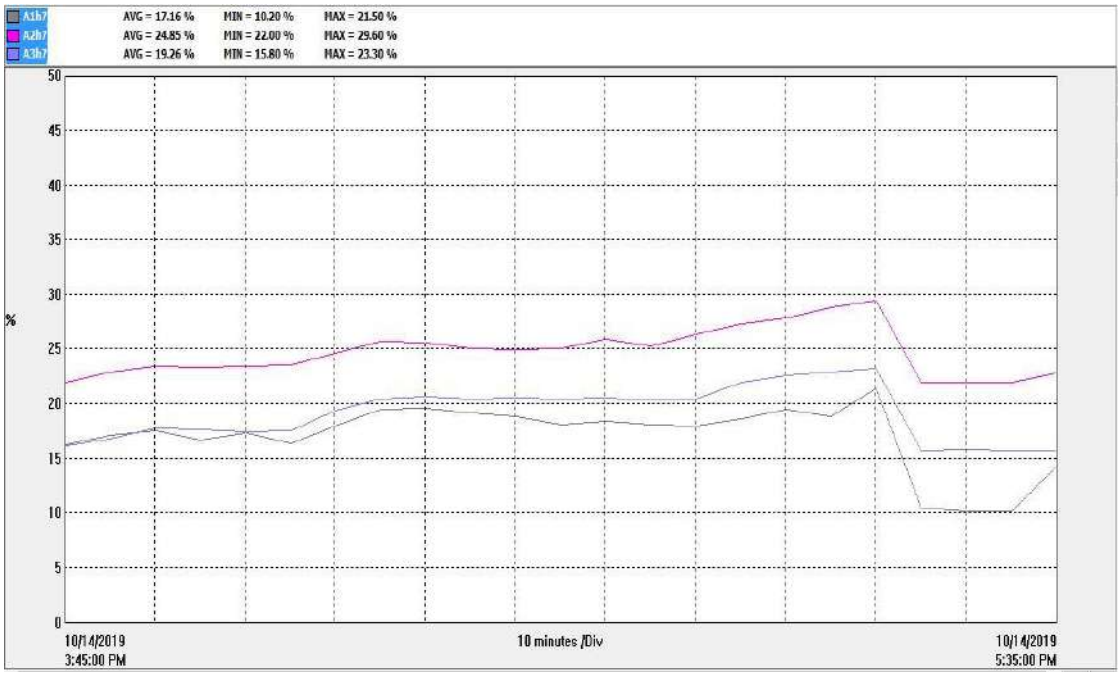

Fig.81 Shows the 7th order THD (voltage harmonics) for 2.0 hours from 14/10/2019 3.45PM to 14/10/2019 5.35PM

Inference: As THD is high, it is recommended to have harmonic filter as preventive measure against equipment failures.

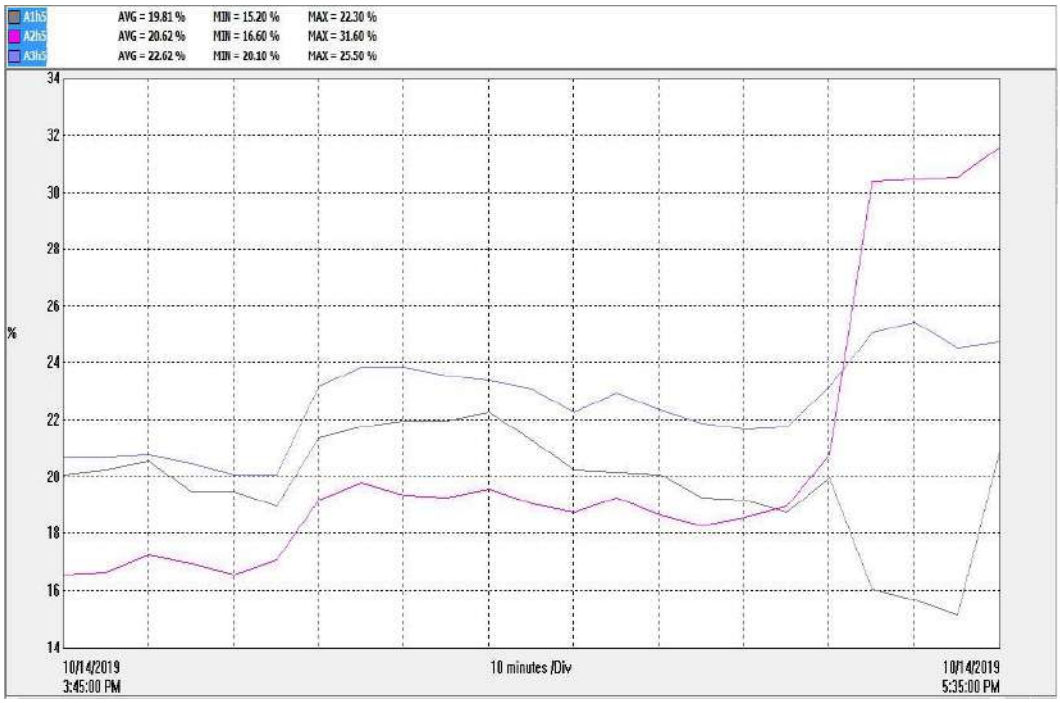

Fig.82 Shows the 5th order THD (voltage harmonics) for 2.0 hours from 14/10/2019 3.45PM to 14/10/2019 5.35PM

Inference: As THD is high, it is recommended to have harmonic filter as preventive measure against equipment failures.

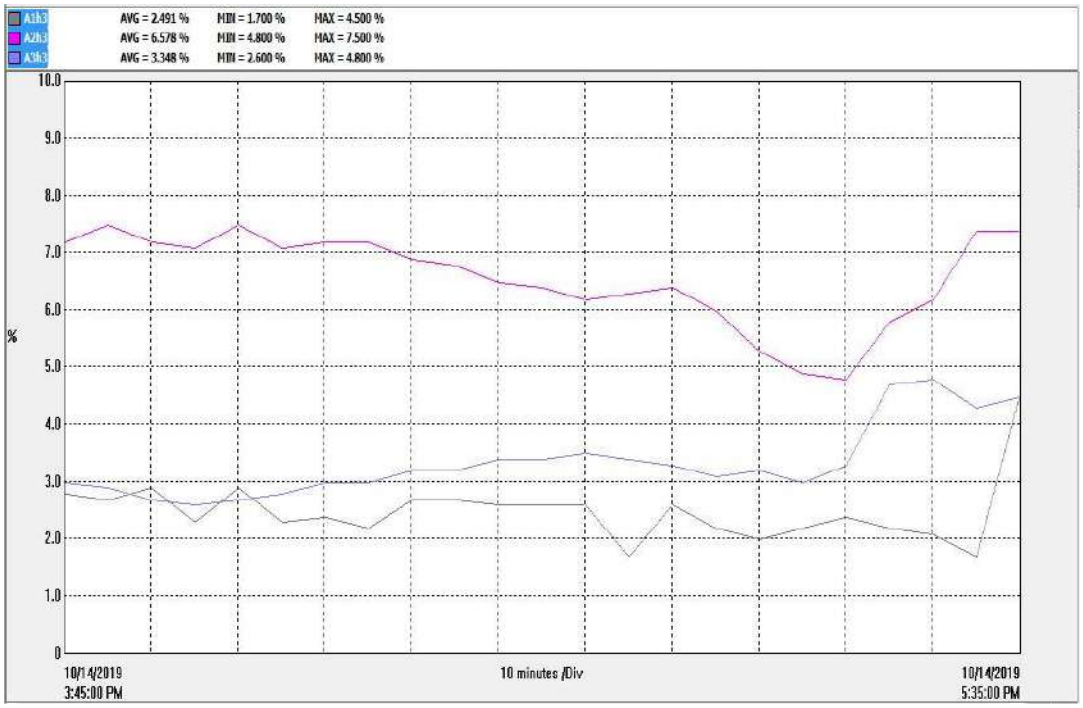

Fig.83 Shows the 3th order THD (voltage harmonics) for 2.0 hours from 14/10/2019 3.45PM to 14/10/2019 5.35PM

Inference: Harmonics seems to be normal.

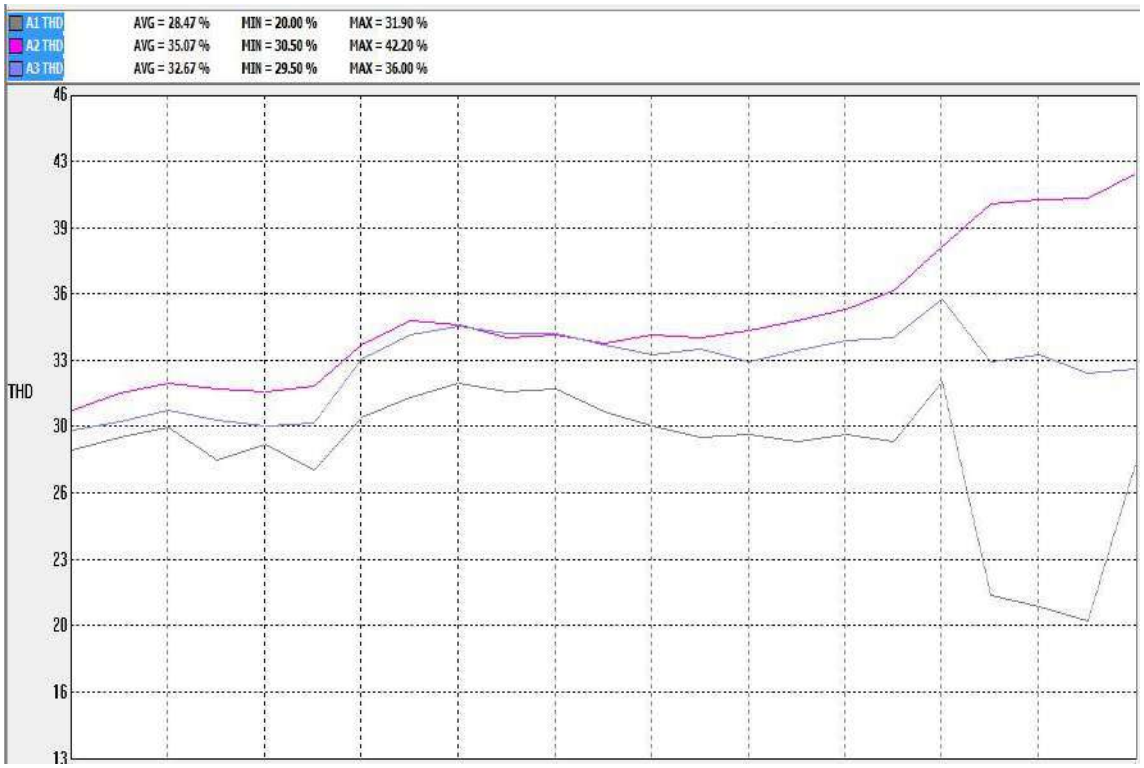

Fig.84 Shows the THD (voltage harmonics) for 2.0 hours from 14/10/2019 3.45PM to 14/10/2019 5.35PM

Inference: As THD is high, it is recommended to have harmonic filter as preventive measure against equipment failures.

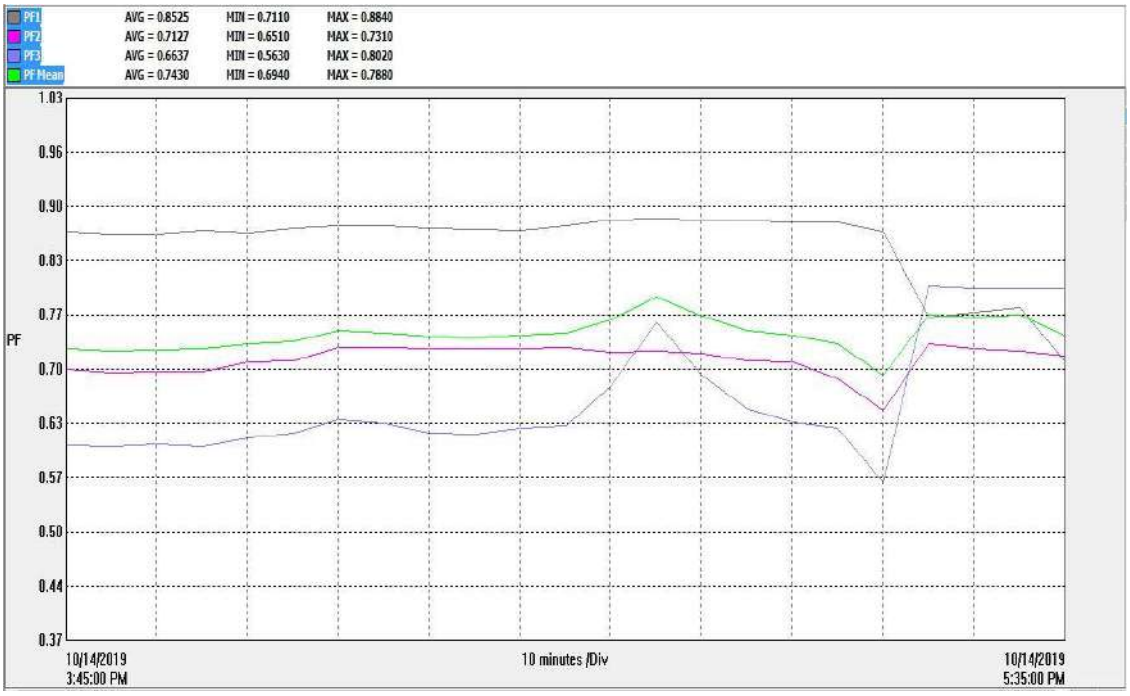

Fig.85 Shows the power factor (PF) for 2.0 hours from 14/10/2019 3.45PM to 14/10/2019 5.35PM

Inference: No unbalanced found here. Need to be improve the PF.

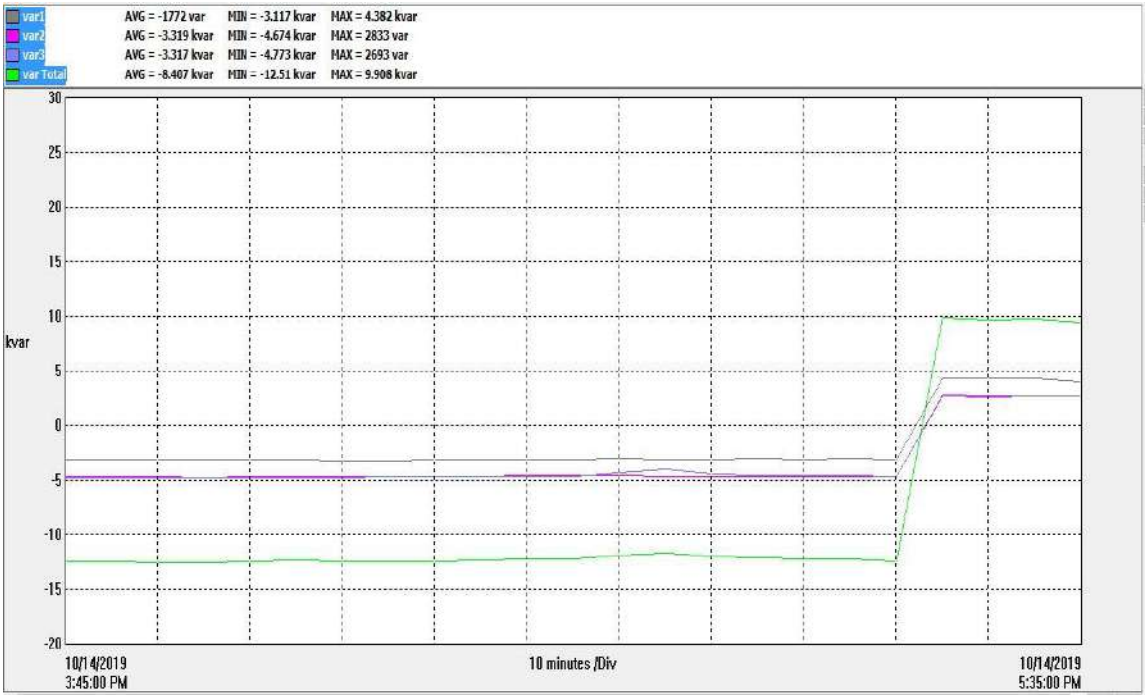

Fig.86 Shows the reactive power (kVAR) for 2.0hours from 14/10/2019 3.45PM to 14/10/2019 5.35PM

Inference: Phase 1 shows very low value and electric connection to be check.

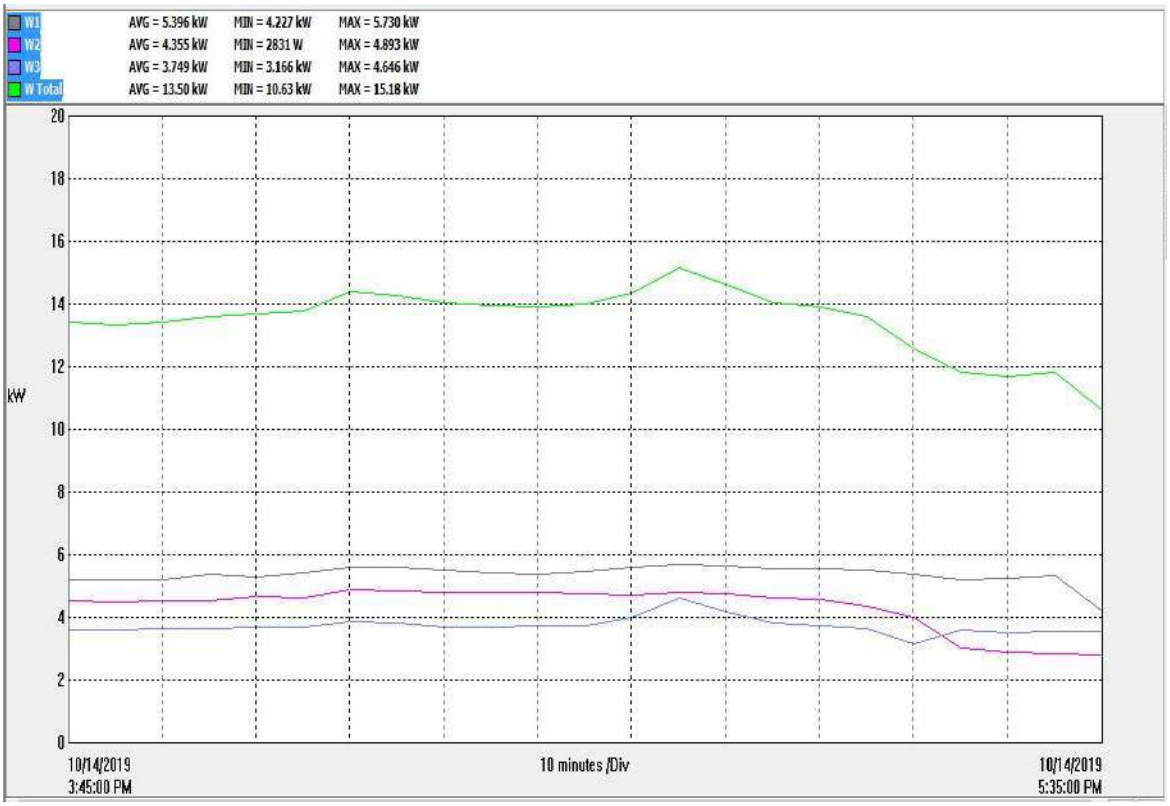

Fig.87 Shows the power (kW) for 2.0 hours from 14/10/2019 3.45PM to 14/10/2019 5.35PM
Inference: No unbalance found here.

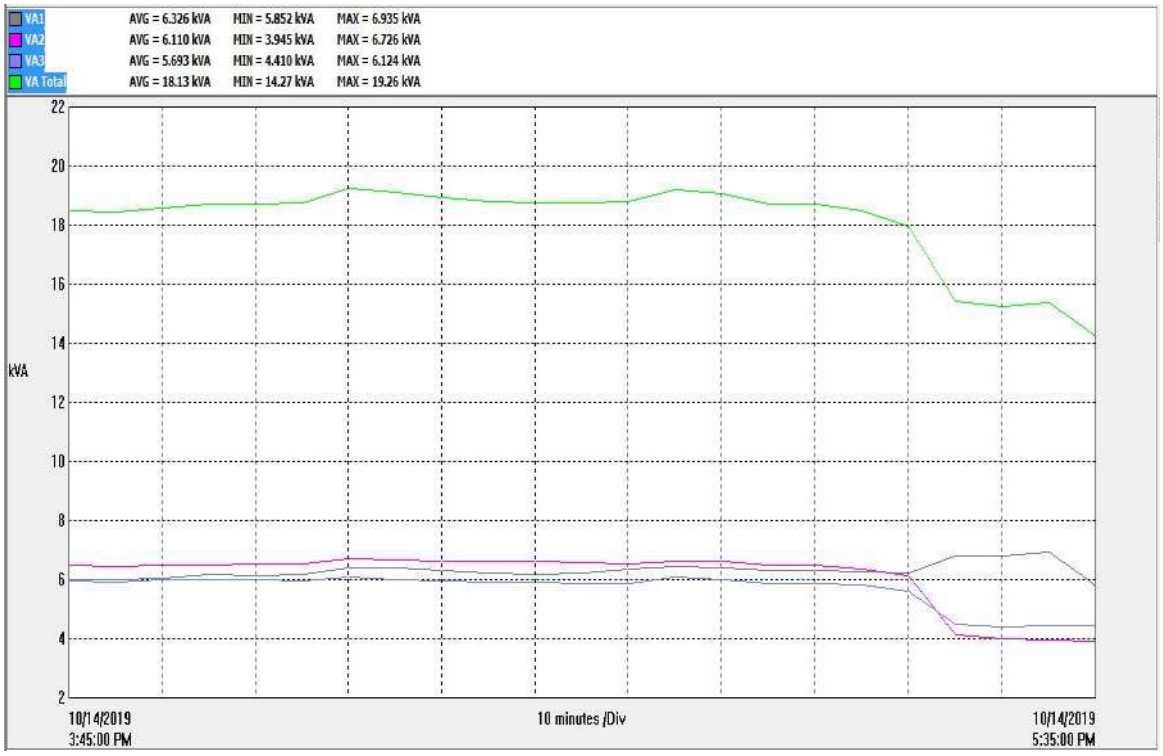

Fig.88 Shows the power (kVA) for 2.0 hours from 14/10/2019 3.45PM to 14/10/2019 5.35PM
Inference: No unbalance found here.

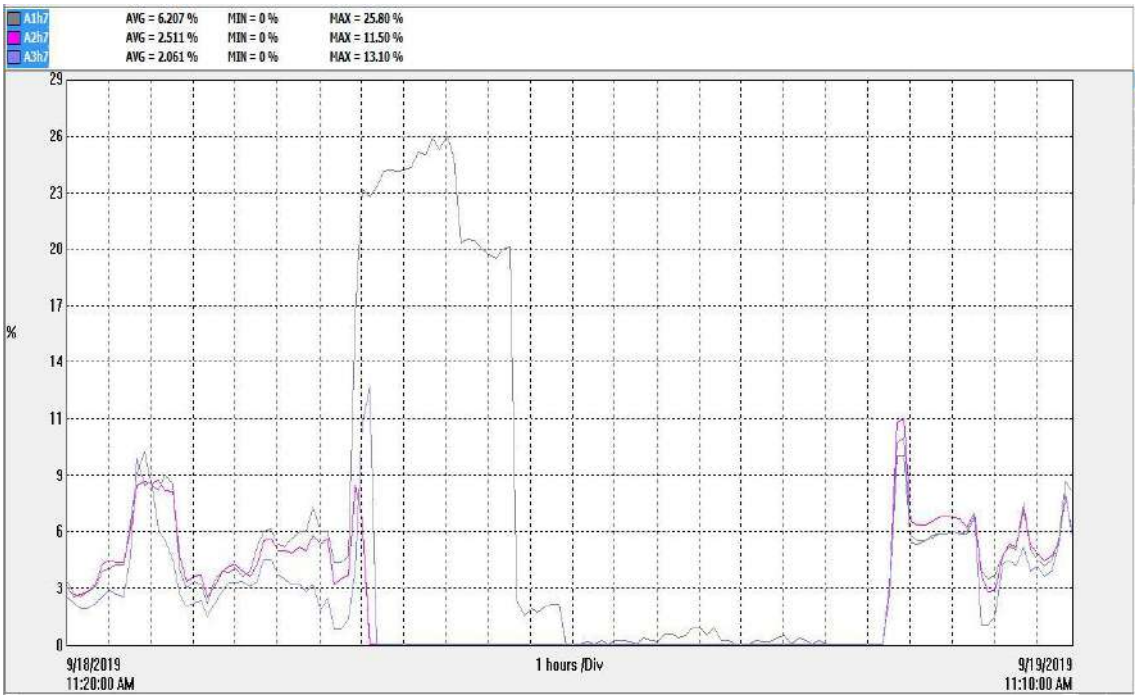

Fig.89 Shows the 7th order THD (voltage harmonics) for 24 hours from 18/9/2019 11.20AM to 19/9/2019 11.10AM

Inference: Harmonics seems to be normal. No need of harmonic filters.

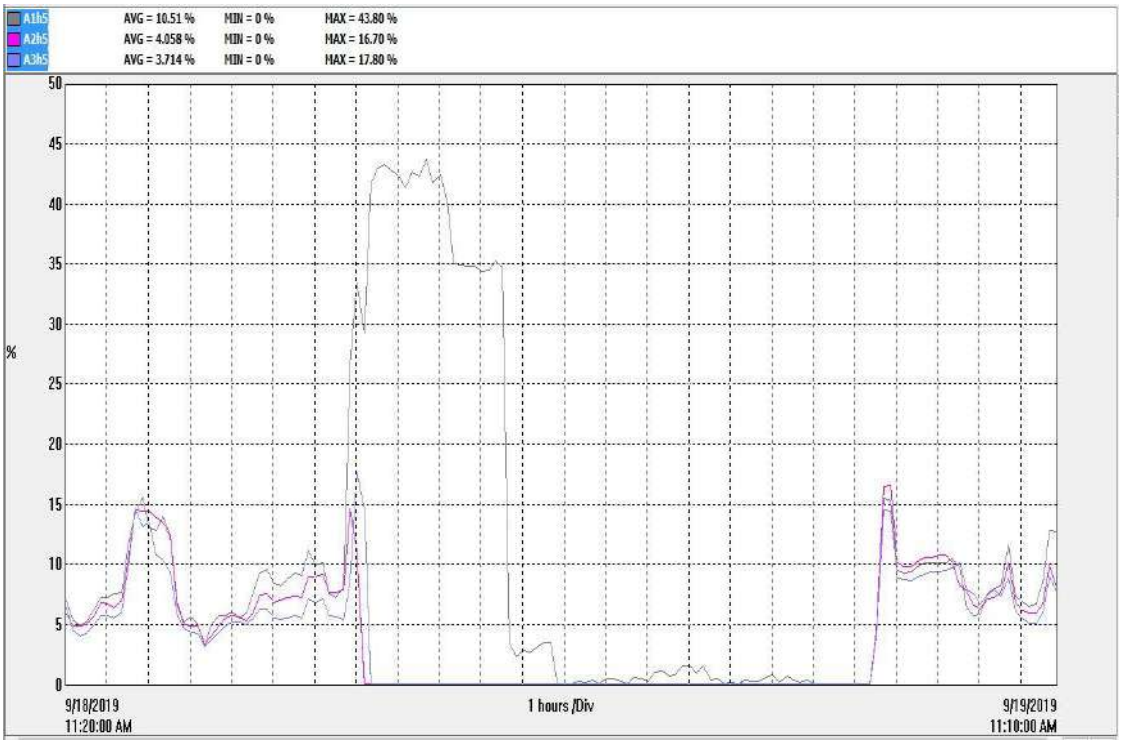

Fig.90 Shows the 5th order THD (voltage harmonics) for 24 hours from 18/9/2019 11.20AM to 19/9/2019 11.10AM

Inference: Harmonics seems to be normal. No need of harmonic filters.

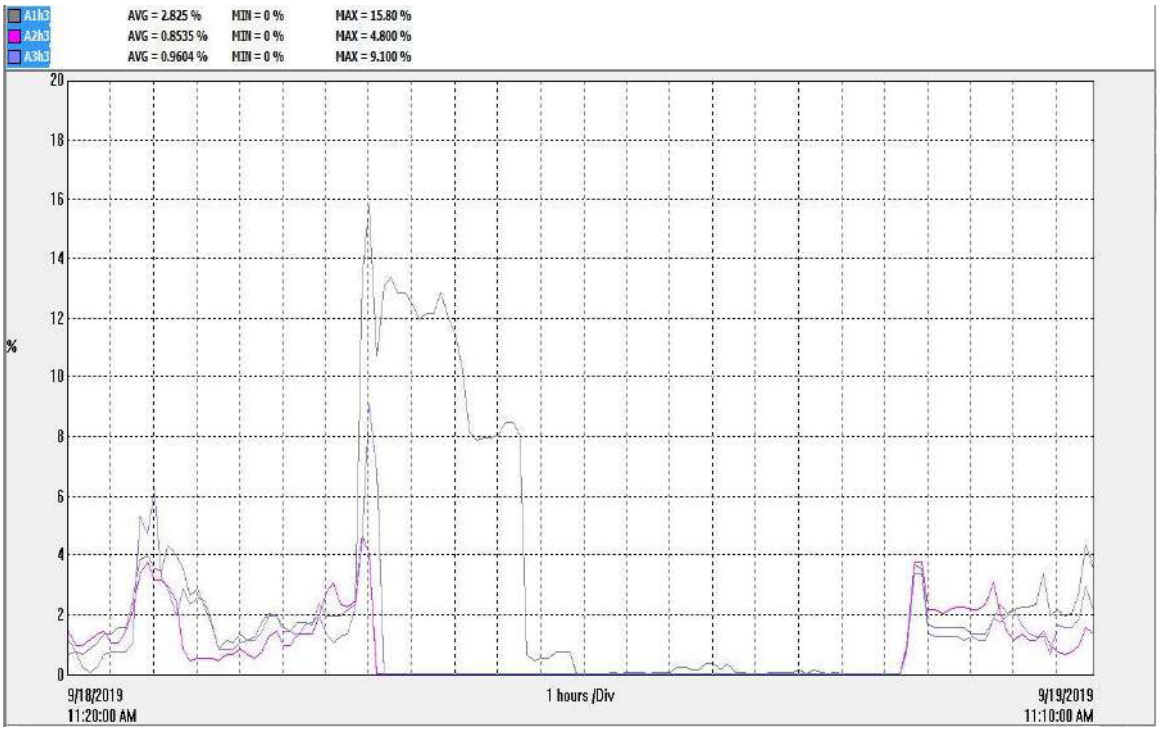

Fig.91 Shows the 3th order THD (voltage harmonics) for 24 hours from 18/9/2019 11.20AM to 19/9/2019 11.10AM

Inference: Harmonics seems to be normal. No need of harmonic filters.

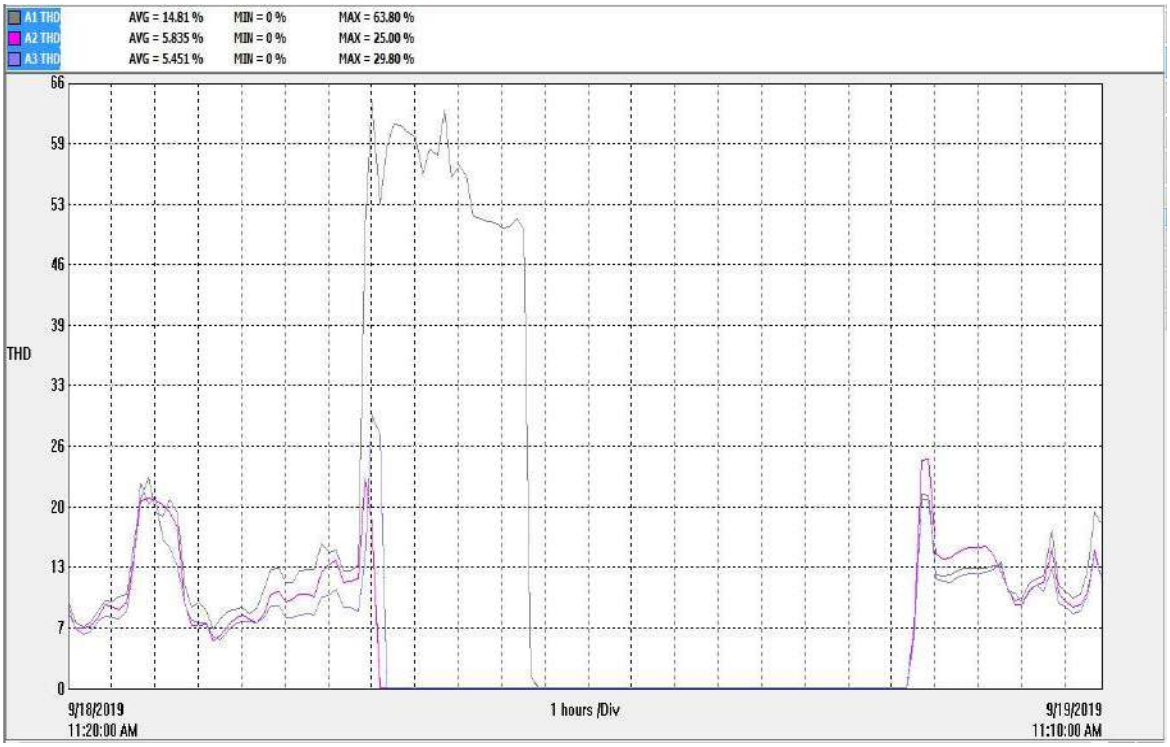

Fig.92 Shows the THD (voltage harmonics) for 24 hours from 18/9/2019 11.20AM to 19/10/2019 11.10AM

Inference: Harmonics seems to be normal. No need of harmonic filters.

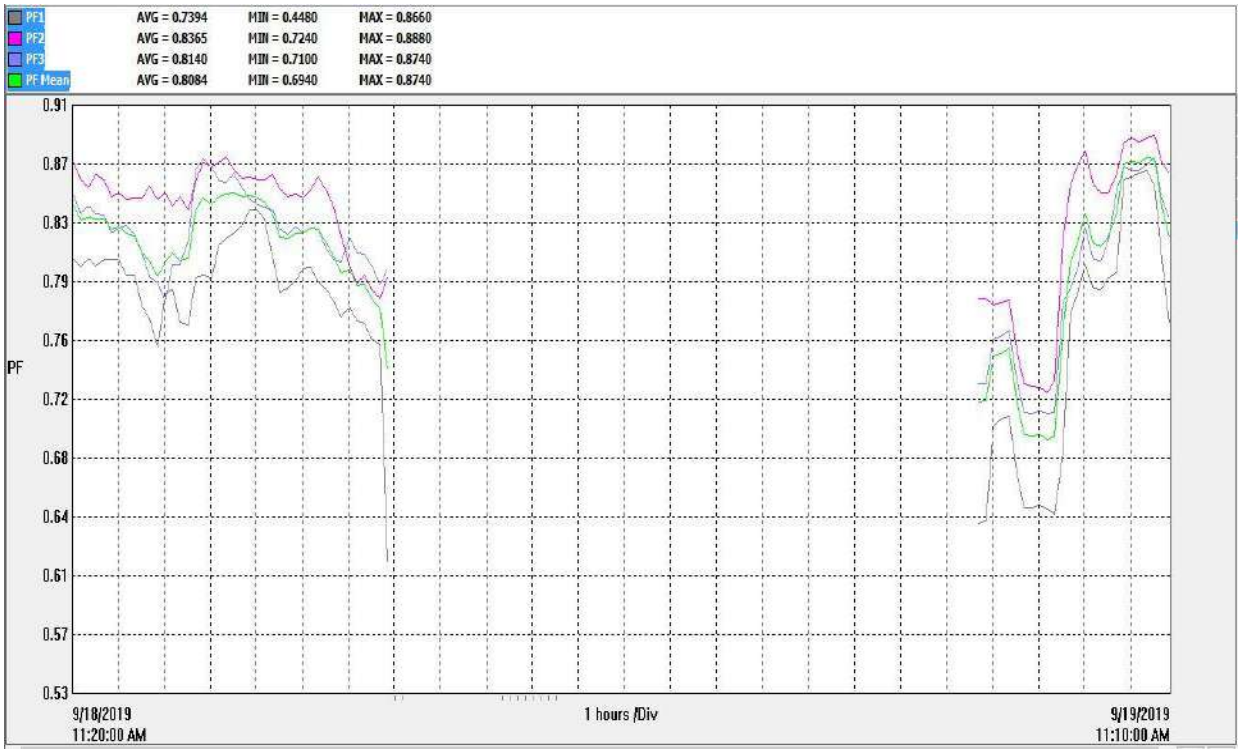

Fig.93 Shows the power factor (PF) for 24 hours from 18/9/2019 11.20AM to 19/9/2019 11.10AM

Inference: No unbalanced found here. Need to improve PF.

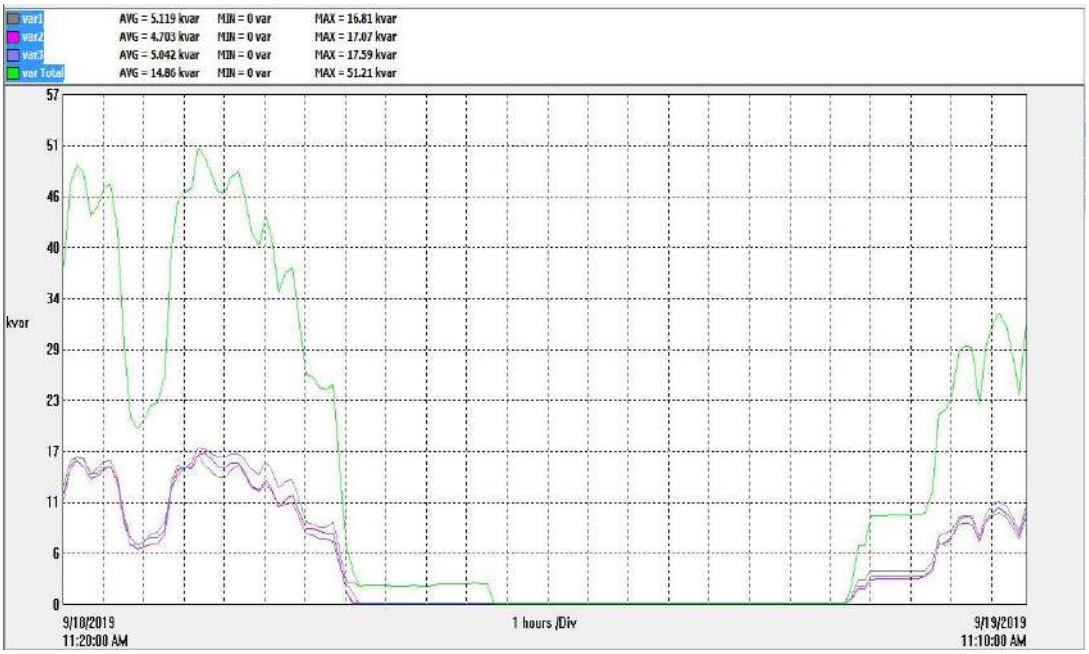

Fig.94 Shows the reactive power (kVAR) for 24 hours from 18/9/2019 11.20AM to 18/9/2019 11.10AM

Inference: No abnormal conditions.

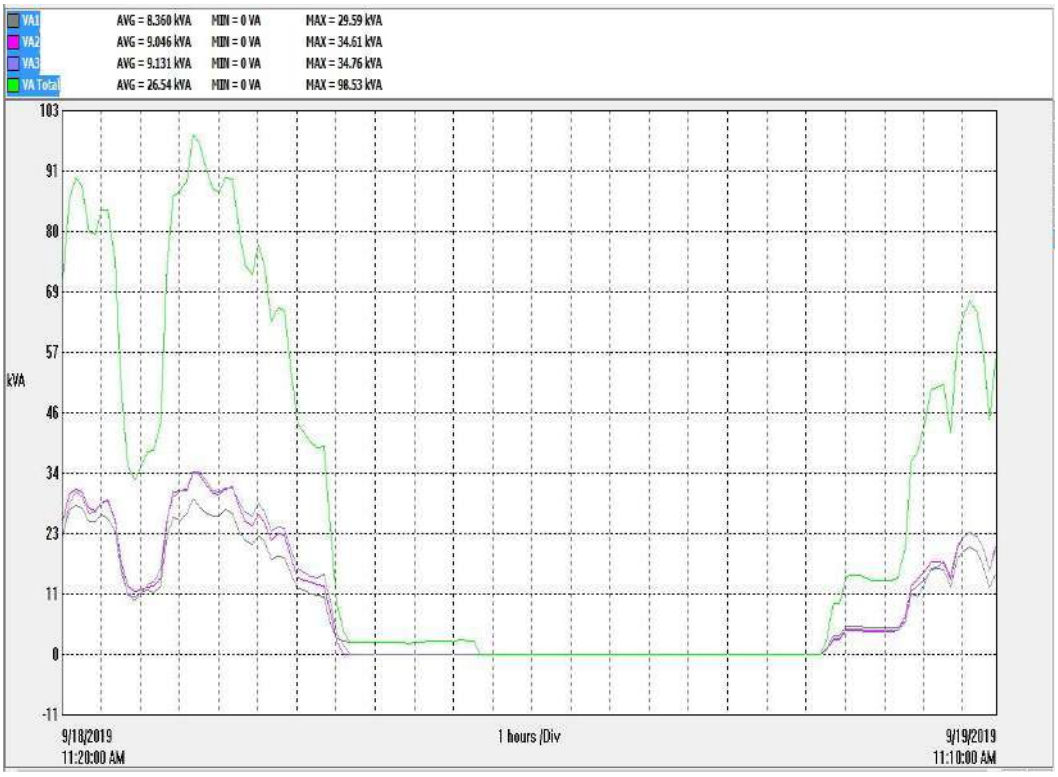

Fig.95 Shows the reactive power (kVAR) for 24 hours from 18/9/2019 11.20AM to 19/9/2019 11.10AM

Inference: No specific observation found.

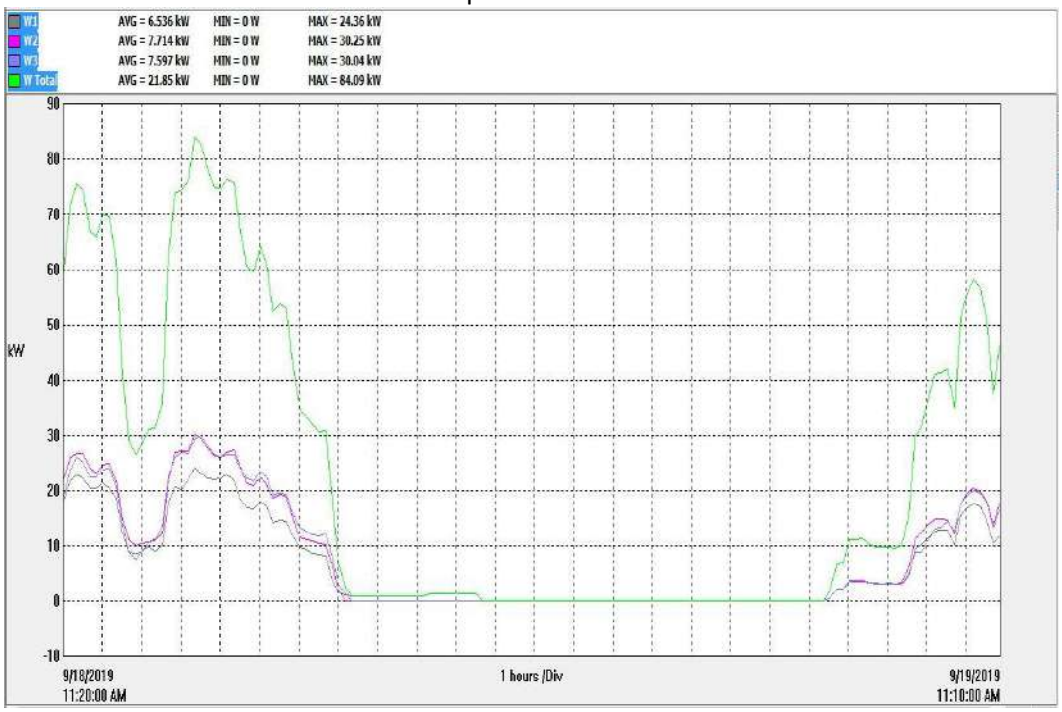

Fig.96 Shows the power (kW) for 24 hours from 18/9/2019 11.20AM to 19/9/2019 11.10AM

Inference: Power distribution is in balanced condition.

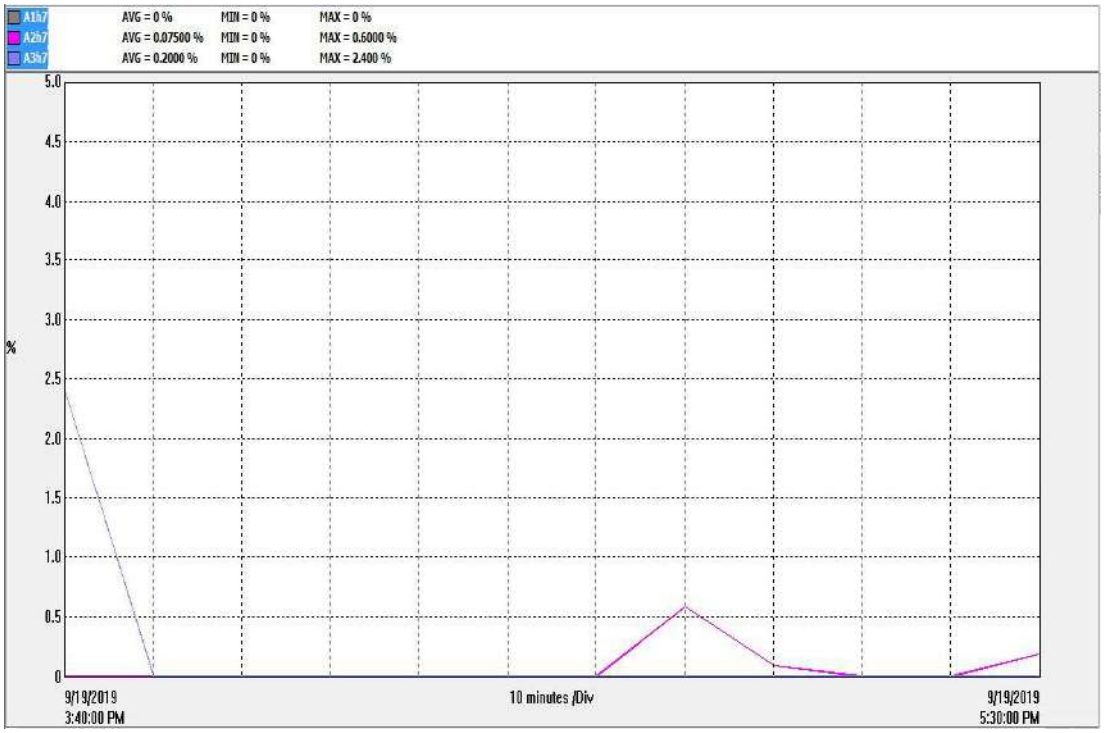

Fig.97 Shows the 7th order THD (voltage harmonics) for 2 hours from 19/9/2019 3.40PM to 19/9/2019 5.30PM

Inference: Harmonics seems to be normal. No need of harmonic filters.

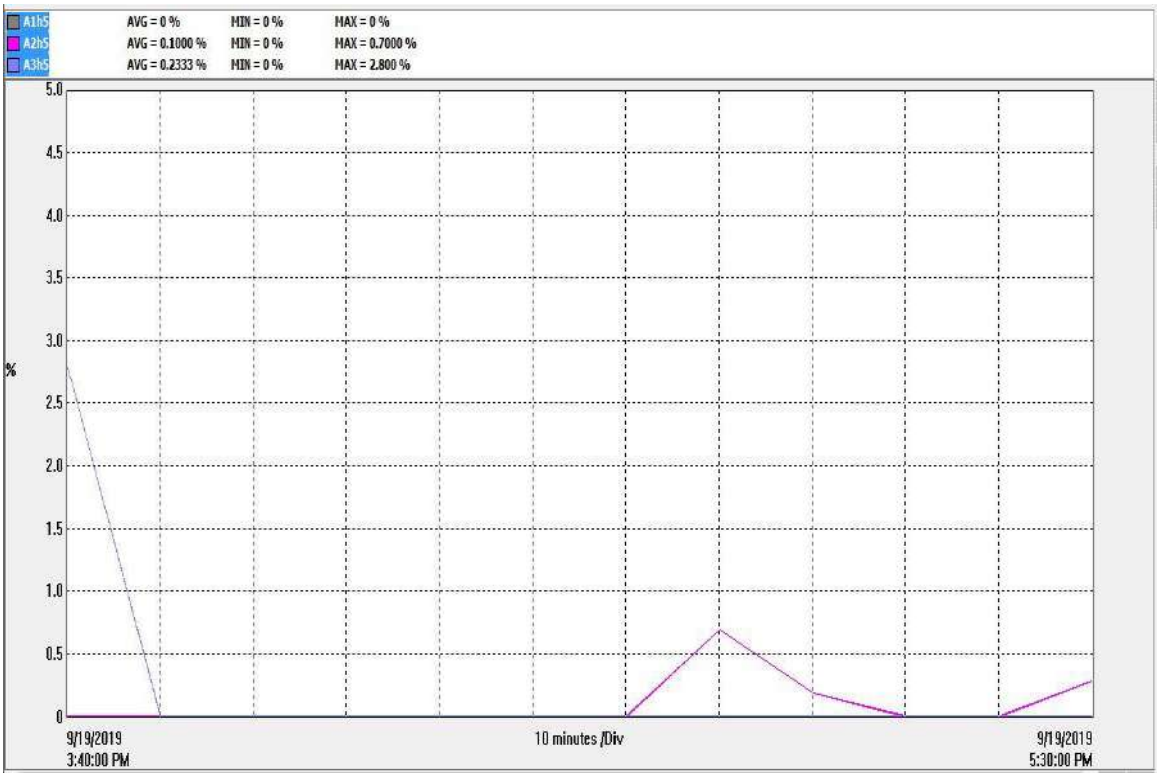

Fig.98 Shows the 5th order THD (voltage harmonics) for 2 hours from 19/9/2019 3.40PM to 19/9/2019 5.30PM

Inference: Harmonics seems to be normal. No need of harmonic filters.

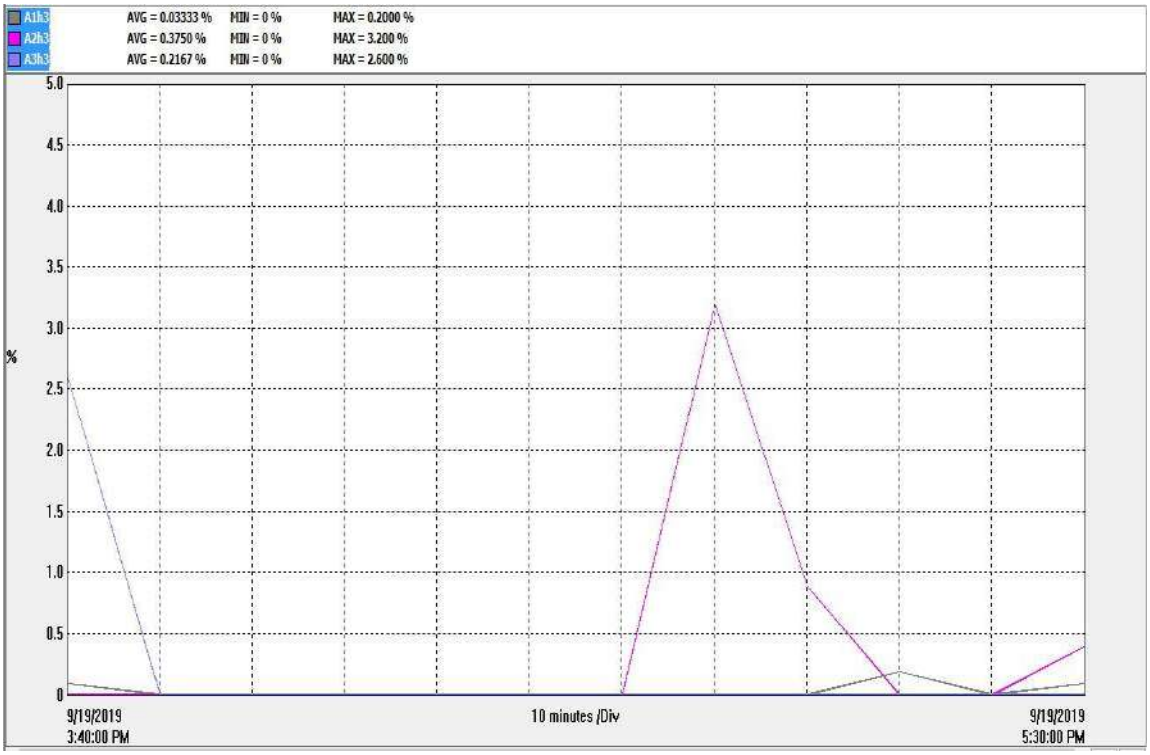

Fig.99 Shows the 3rd order THD (voltage harmonics) for 1.50 hours from 19/9/2019 3.40PM to 19/9/2019 5.30PM

Inference: Harmonics seems to be normal. No need of harmonic filters.

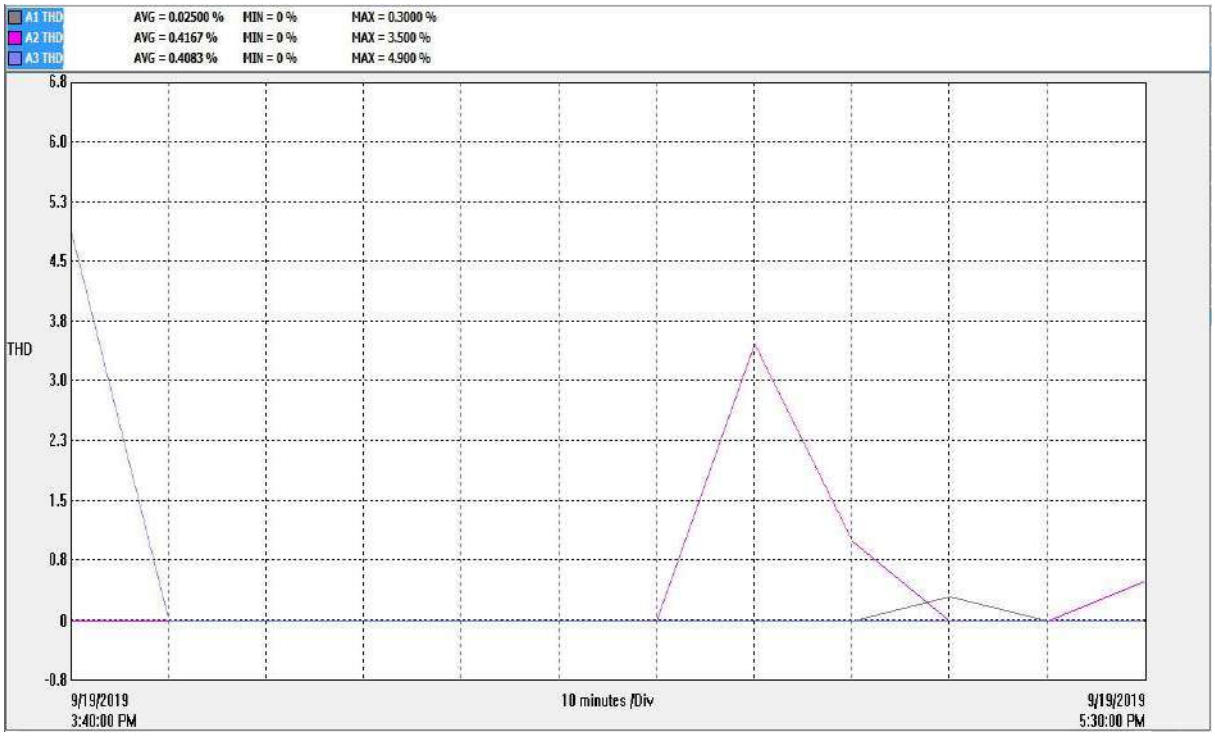

Fig.100 Shows the THD (voltage harmonics) for 2 hours from 19/9/2019 3.40PM to 19/9/2019 5.30PM

Inference: Harmonics seems to be normal. No need of harmonic filters.

Fig.101 Shows the power factor (PF) for 1.50 hours from 19/9/2019 3.40PM to 19/9/2019 5.30PM
Inference: No unbalanced found here. Need to be improve the PF.

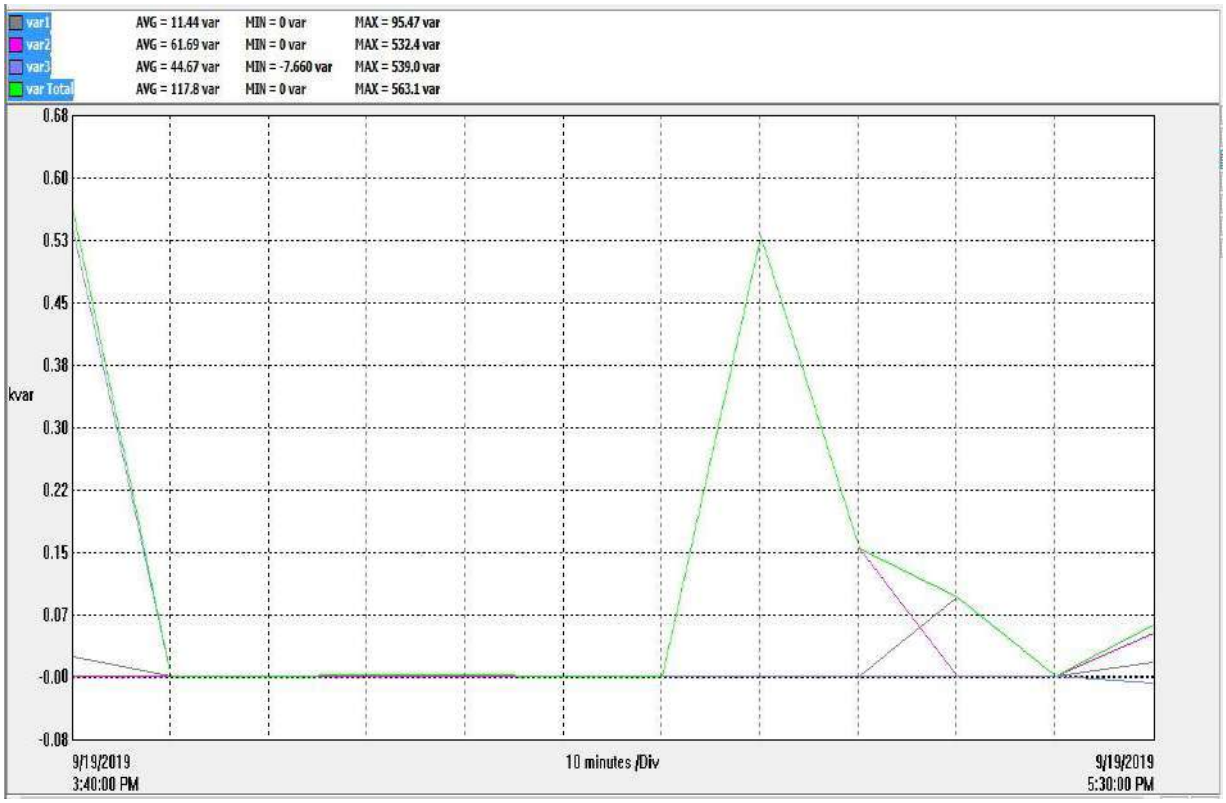

Fig.102 Shows the reactive power (kVAR) for 2 hours from 19/9/2019 3.40PM to 19/9/2019 5.30PM
Inference: Phase 1 shows very low KVAR compare to other two phases. Need to check the connection.

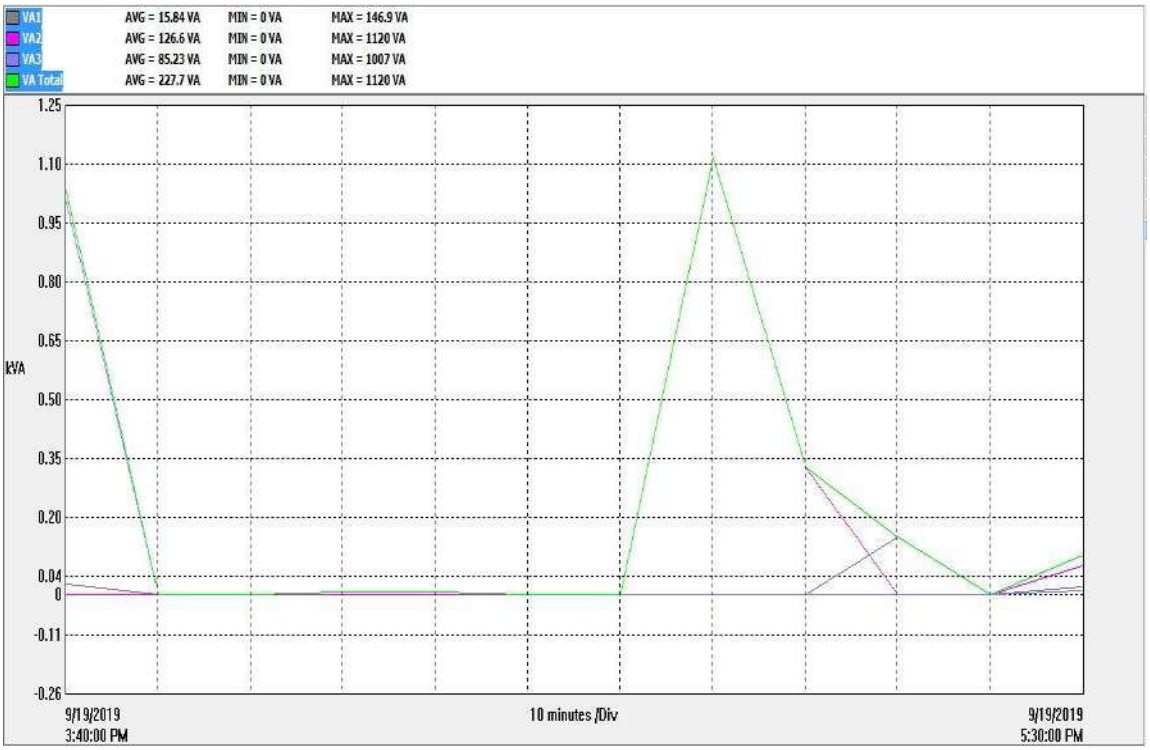

Fig.103 Shows the power (kVA) for 2 hours from 19/9/2019 3.40PM to 19/9/2019 5.30PM
Inference: Phase 1 shows very low value. Need for connection checking.

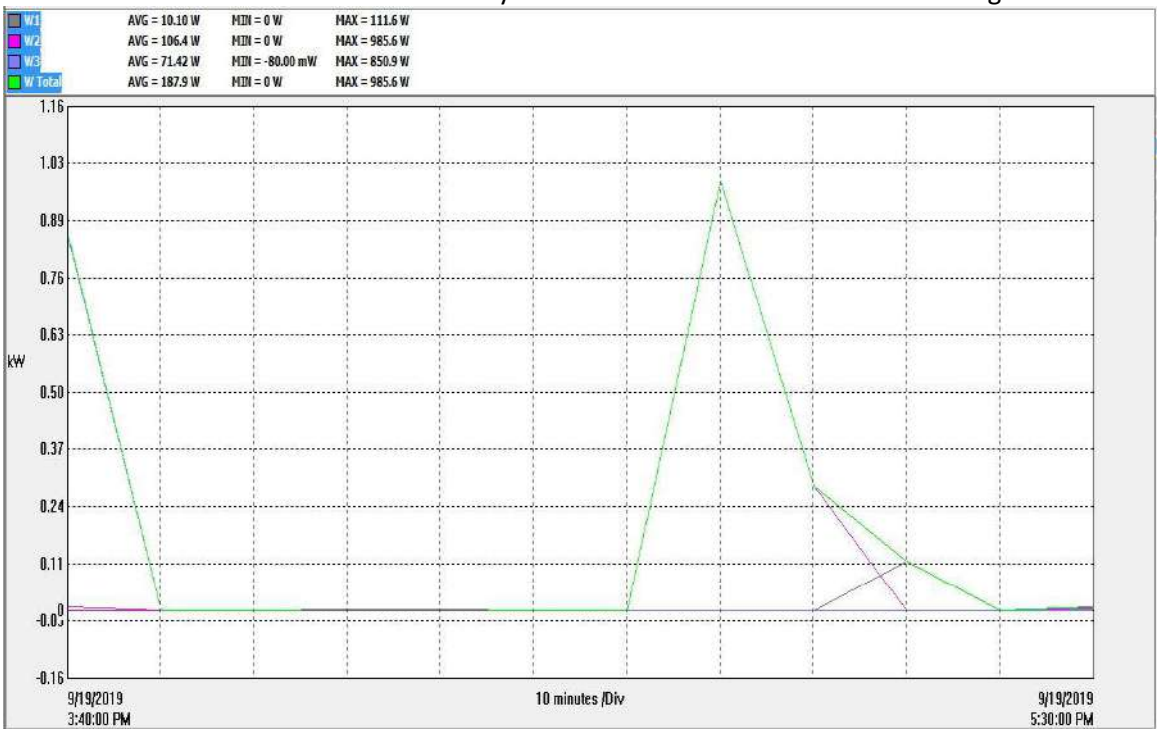

Fig.104 Shows the power (kW) for 2 hours from 19/9/2019 3.40PM to 19/9/2019 5.30PM
Inference: Power distribution not balanced. Phase 2 shows very low value.

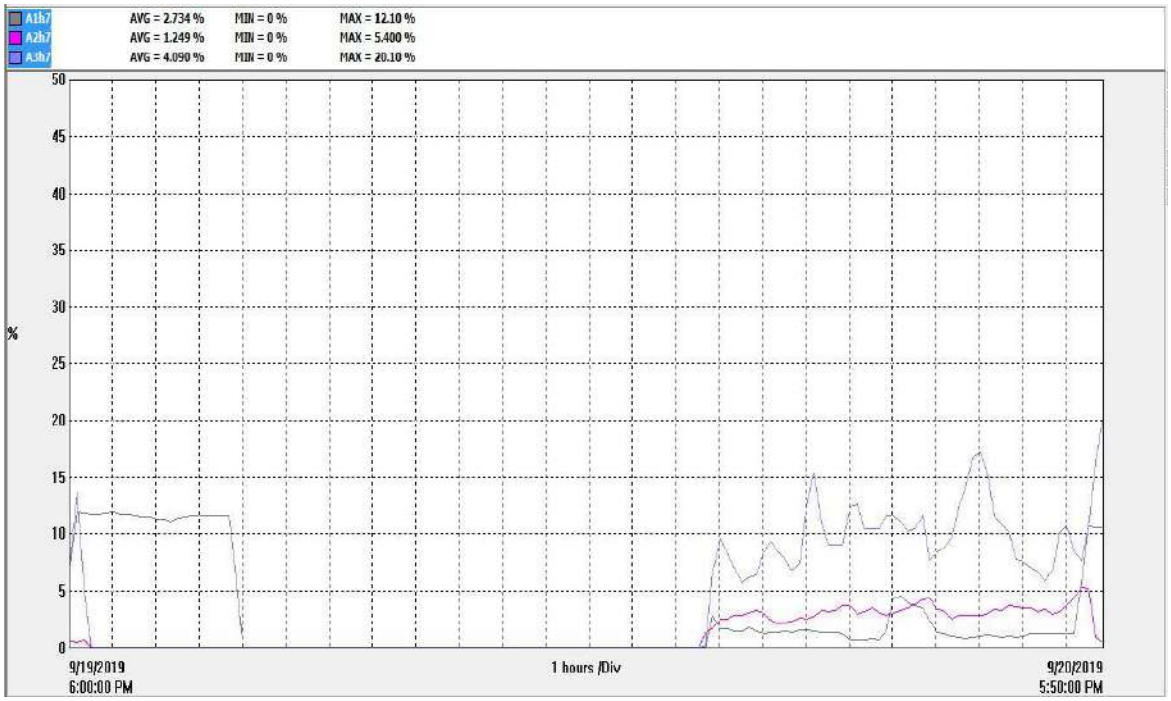

Fig.105 Shows the 7th order THD (voltage harmonics) for 24 hours from 19/9/2019 6.00PM to 20/9/2019 5.50PM

Inference: Harmonics seems to be normal. No need of harmonic filters.

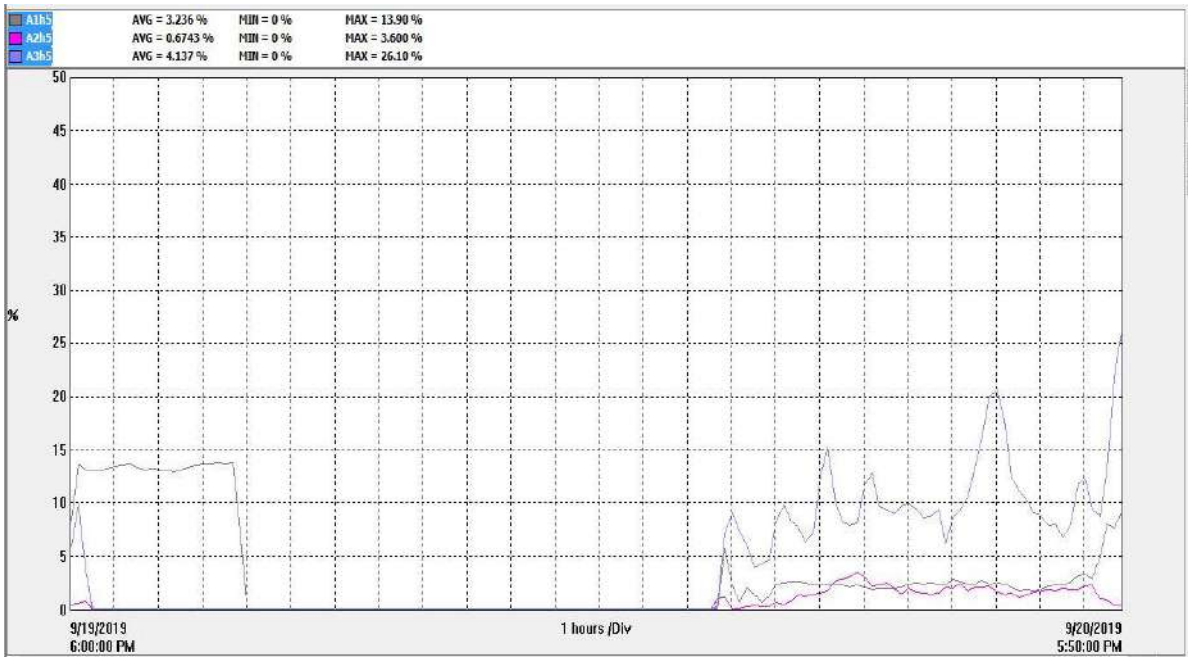

Fig.106 Shows the 5th order THD (voltage harmonics) for 24 hours from 19/9/2019 6.00PM to 20/9/2019 5.50PM

Inference: Harmonics seems to be normal. No need of harmonic filters.

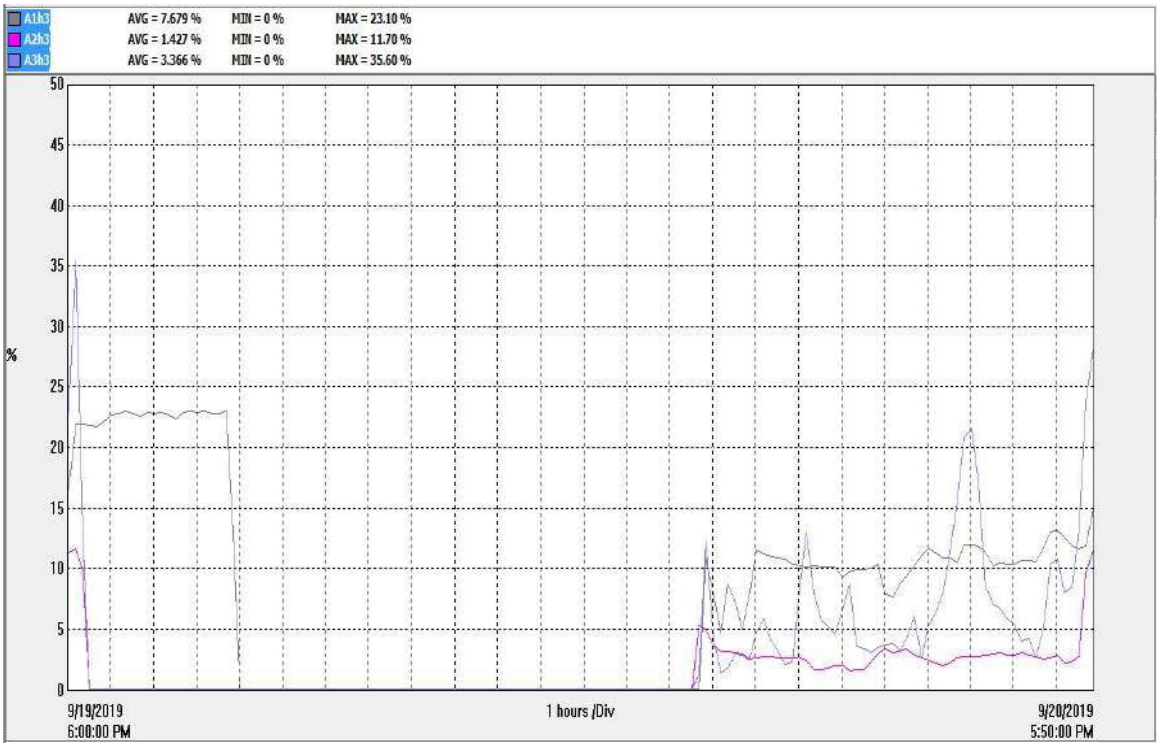

Fig.107 Shows the 3th order THD (voltage harmonics) for 24 hours from 19/9/2019 6.00PM to 20/9/2019 5.50PM

Inference: Harmonics seems to be normal. No need of harmonic filters.

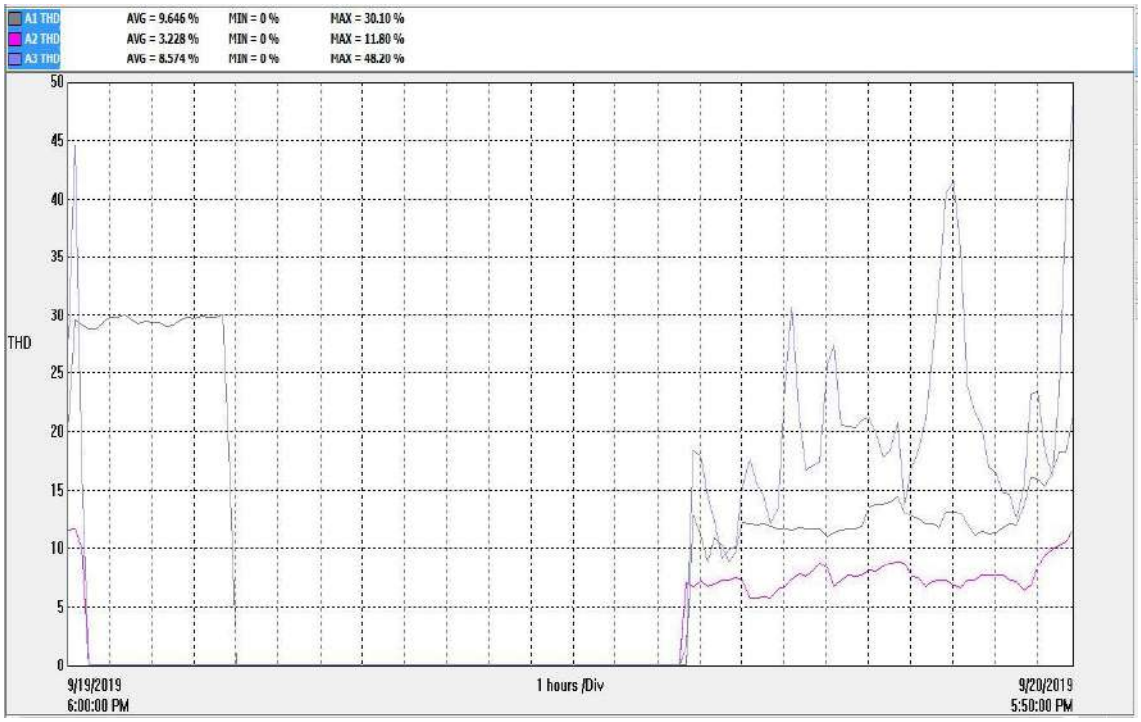

Fig.108 Shows the THD (voltage harmonics) for 24 hours from 19/9/2019 6.00PM to 20/9/2019 5.50AM

Inference: Harmonics seems to be normal. No need of harmonic filters.

Fig.109 Shows the power factor (PF) for 24 hours from 19/9/2019 6.00PM to 20/9/2019 5.50PM
Inference: No unbalanced found here. Need to improve the PF.

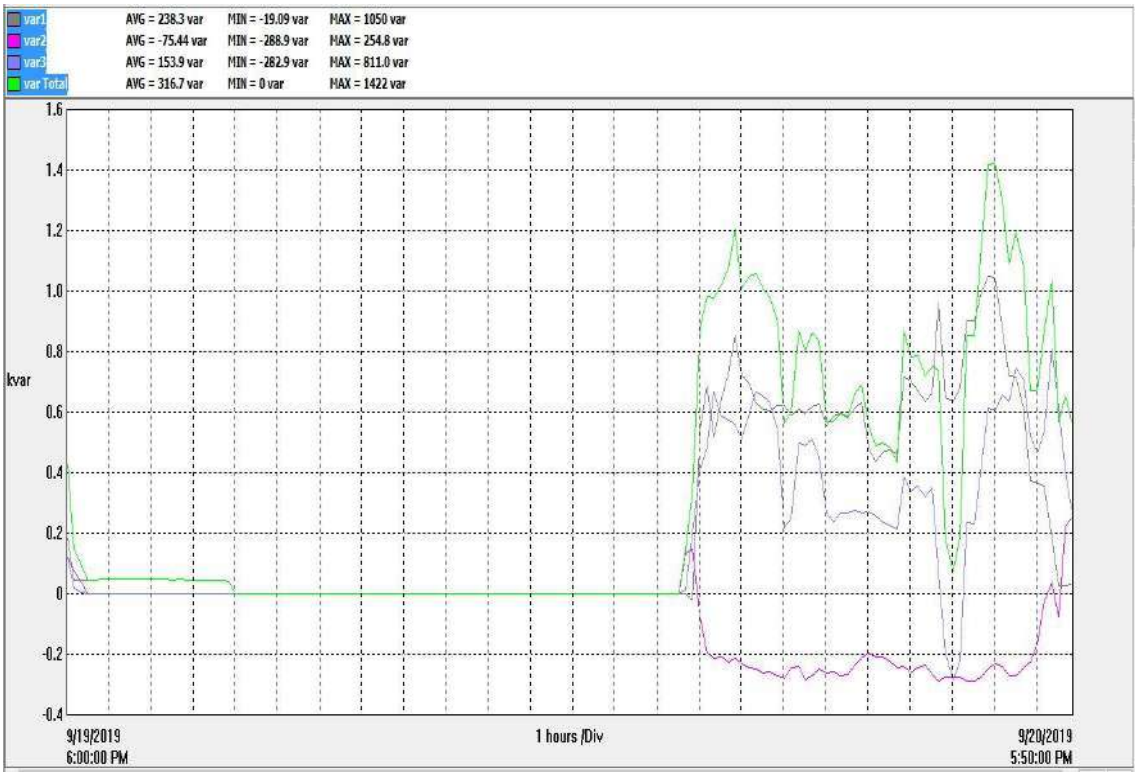

Fig.110 Shows the reactive power (kVAR) for 24 hours from 19/9/2019 6.00PM to 20/9/2019 5.50PM
Inference: Phase 2 shows very low KVAR compare to others. So need for connection checking.

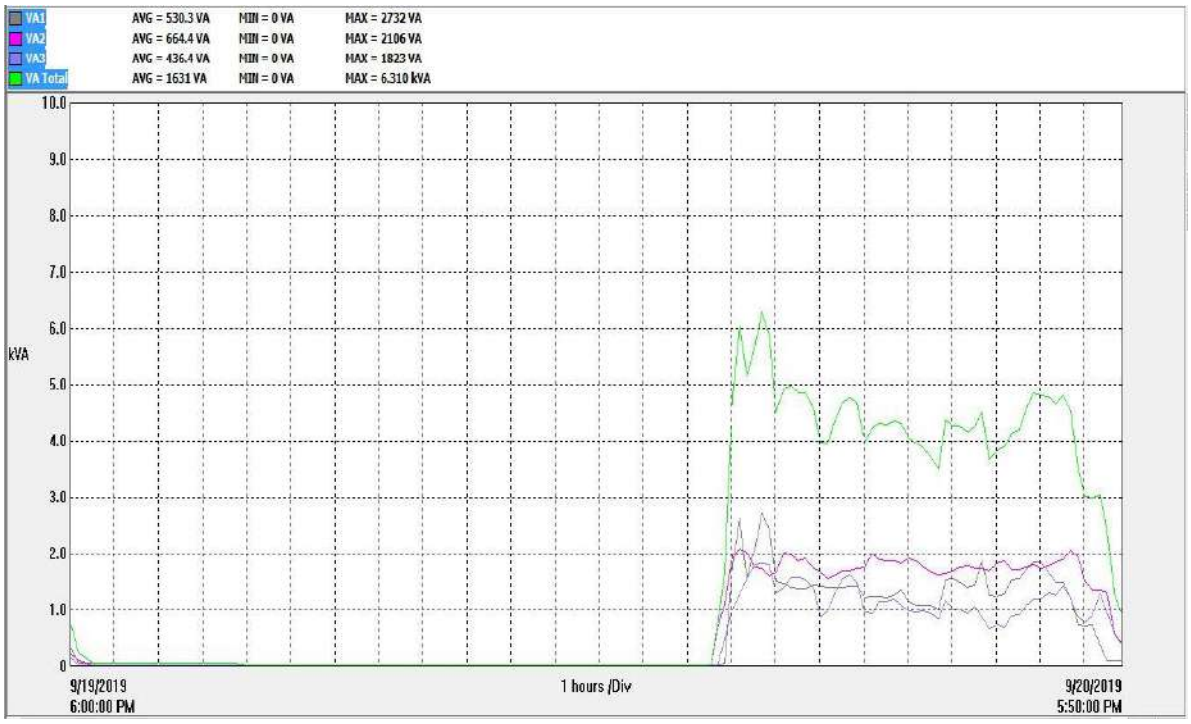

Fig.111 Shows the power (kVA) for 24 hours from 19/9/2019 6.00PM to 20/9/2019 5.50PM
Inference: No specific Observation found.

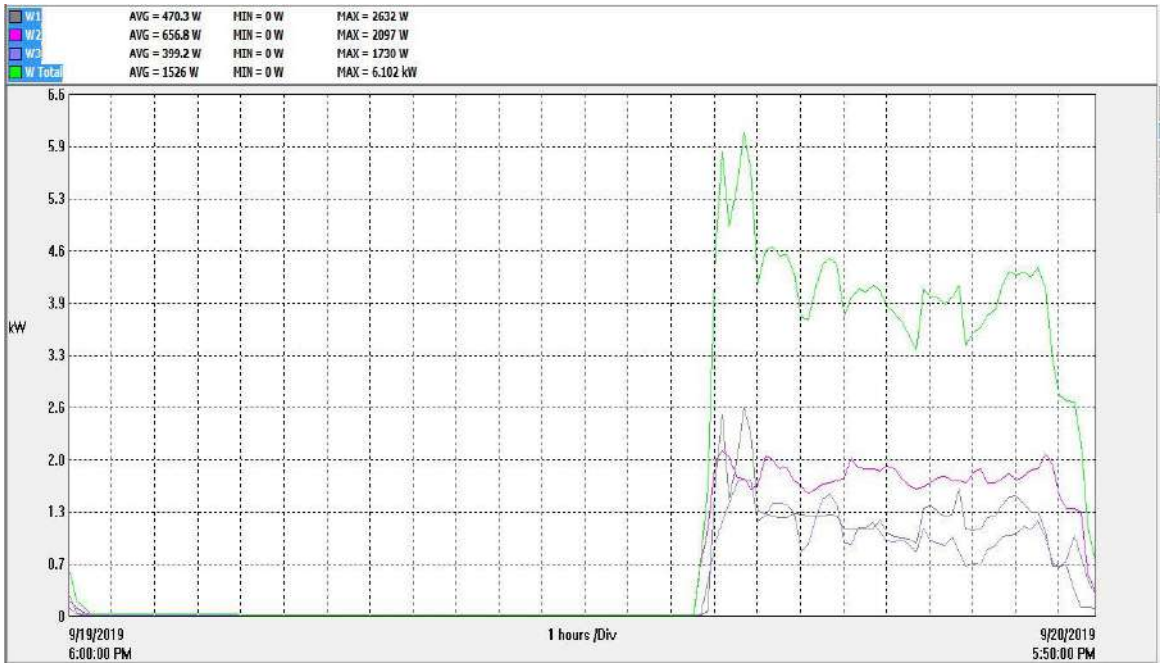

Fig.112 Shows the power (kW) for 24 hours from 19/9/2019 6.00PM to 20/9/2019 5.50PM
Inference: Power distribution is not in balanced condition.

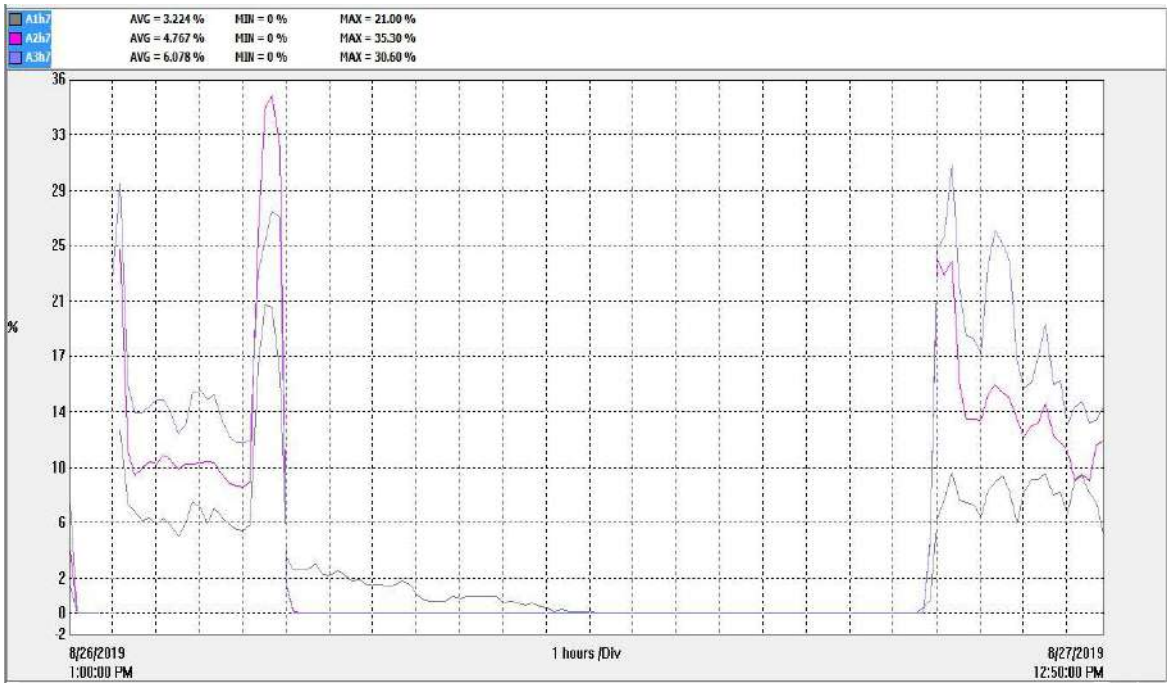

Fig.113 Shows the 7th order THD (voltage harmonics) for 24 hours from 26/8/2019 1.00PM to 27/8/2019 12.50PM

Inference: Harmonics seems to be normal. No need of harmonic filters.

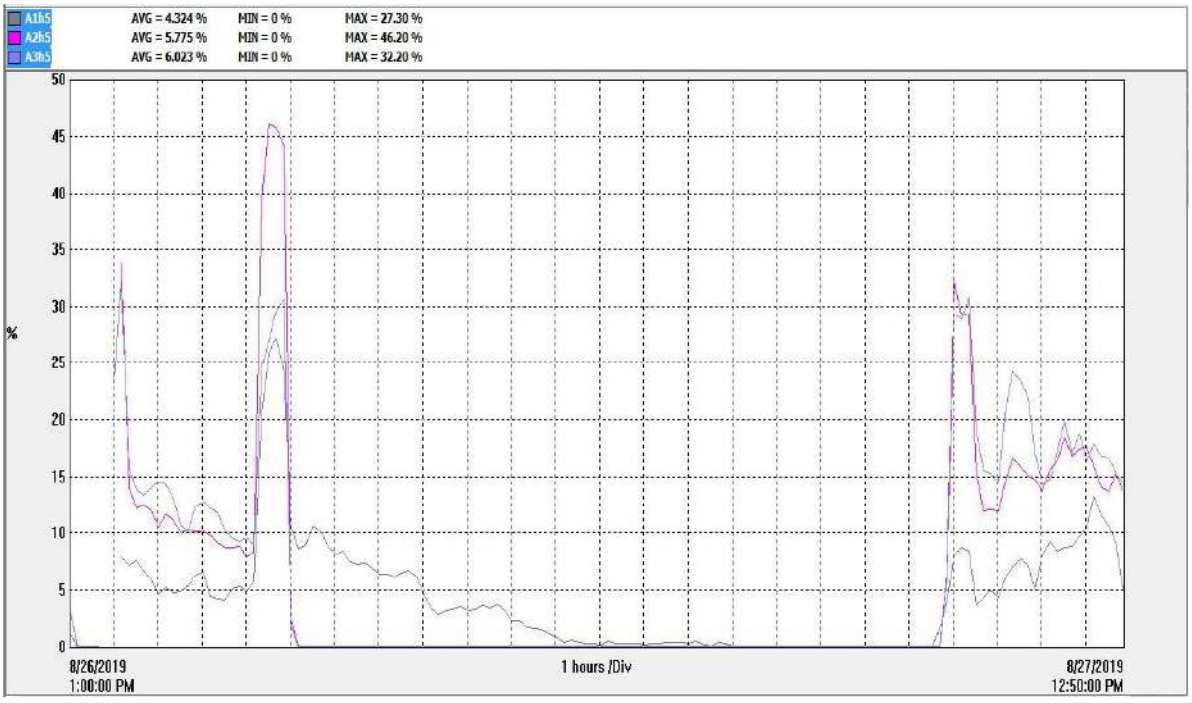

Fig.114 Shows the 5th order THD (voltage harmonics) for 24 hours from 26/8/2019 1.00PM to 27/8/2019 12.50PM

Inference: Harmonics seems to be normal. No need of harmonic filters.

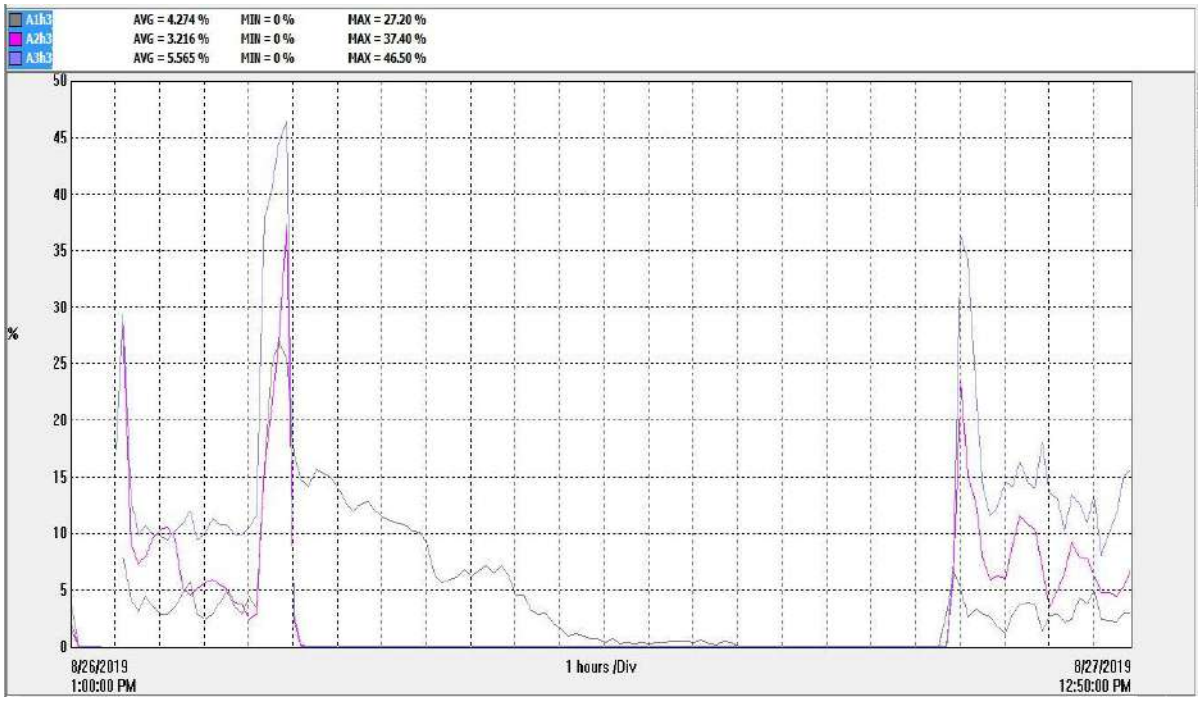

Fig.115 Shows the 3th order THD (voltage harmonics) for 24 hours from 26/8/2019 1.00PM to 27/8/2019 12.50PM

Inference: Harmonics seems to be normal. No need of harmonic filters.

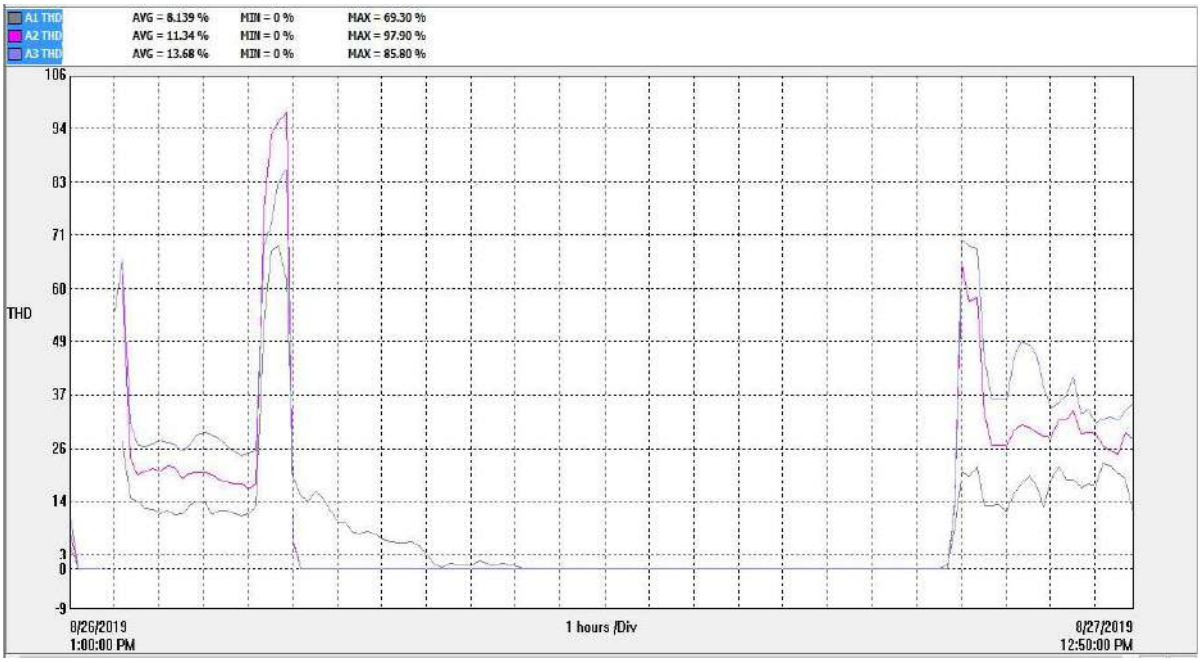

Fig.116 Shows the THD (voltage harmonics) for 24 hours from 26/8/2019 1.00PM to 27/8/2019 12.50PM

Inference: Harmonics seems to be more fluctuation. Need of harmonic filters.

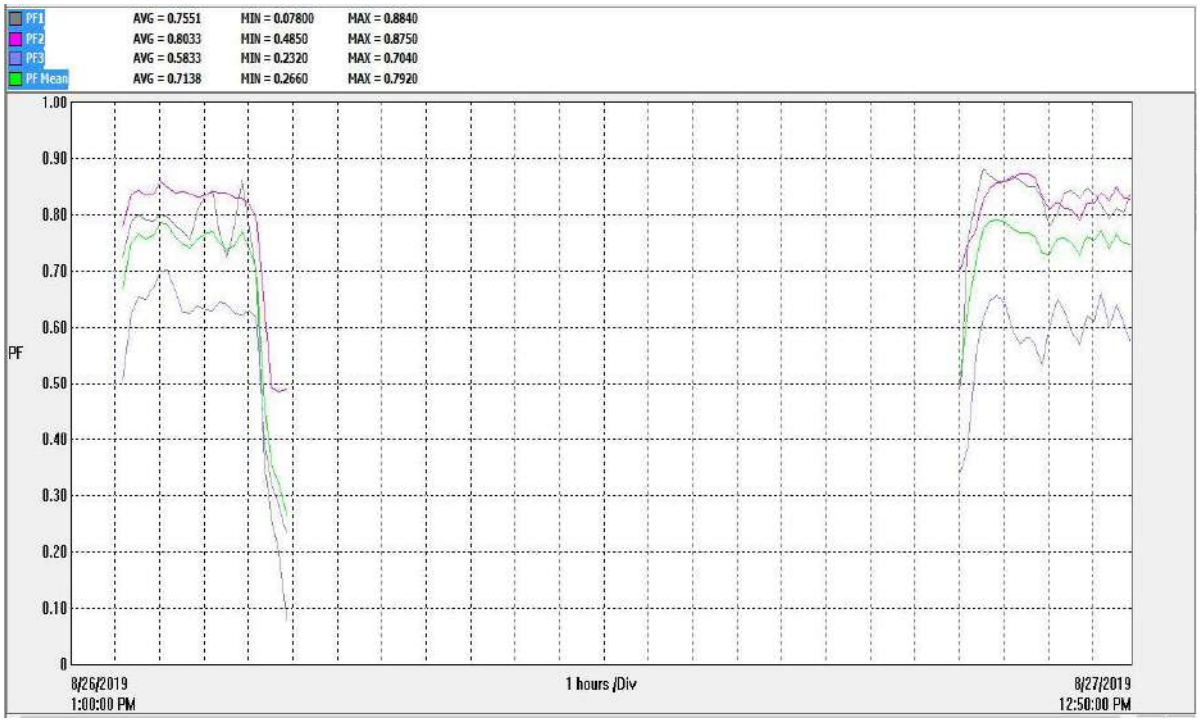

Fig.117 Shows the THD (voltage harmonics) for 24 hours from 26/8/2019 1.00PM to 27/9/2019 12.50PM

Inference: Unbalanced found here. Need to be improve the PF.

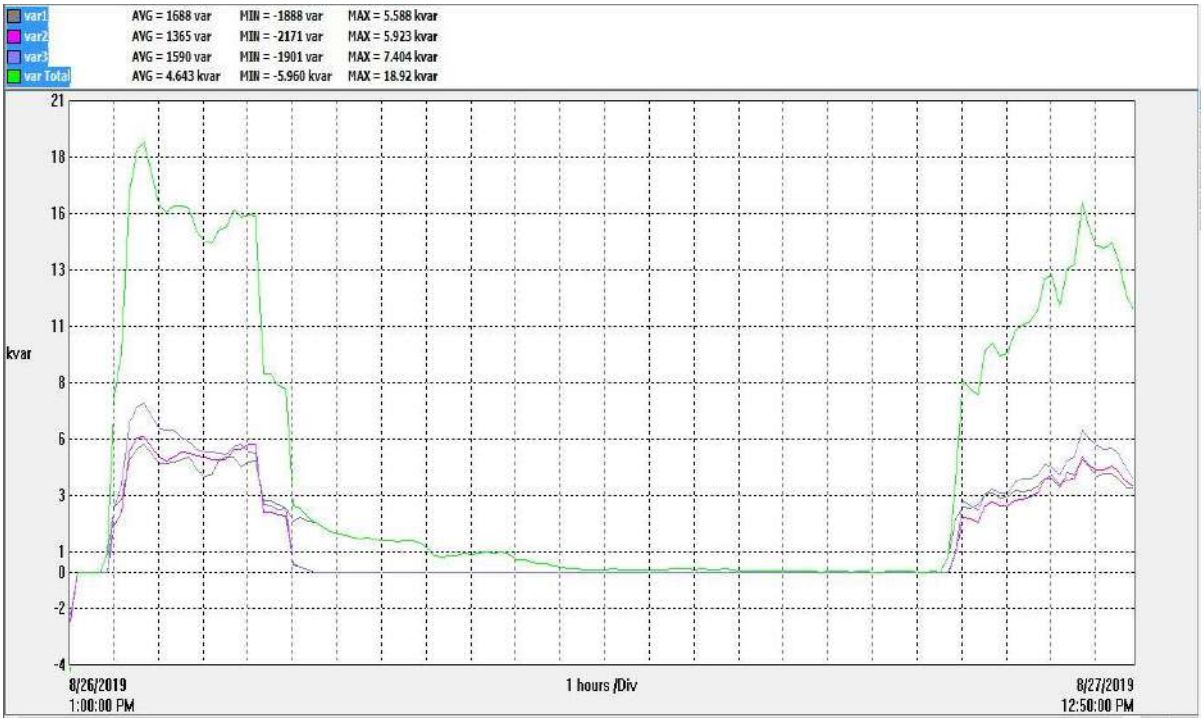

Fig.118 Shows the reactive power (kVAR) for 24 hours from 26/8/2019 1.00PM to 27/8/2019 12.50PM

Inference: distributed in balanced condition.

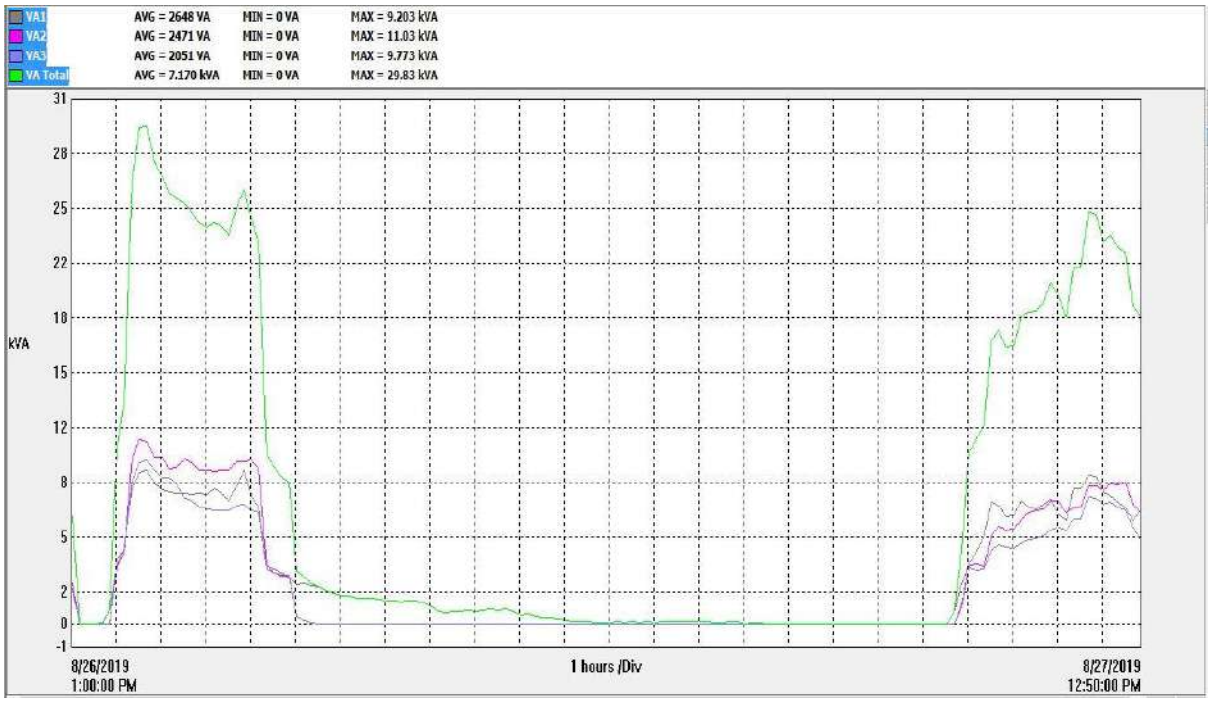

Fig.119 Shows the reactive power (kVAR) for 24 hours from 26/8/2019 1.00PM to 27/8/2019 12.50PM

Inference: Phase 2 shows very low KVA.

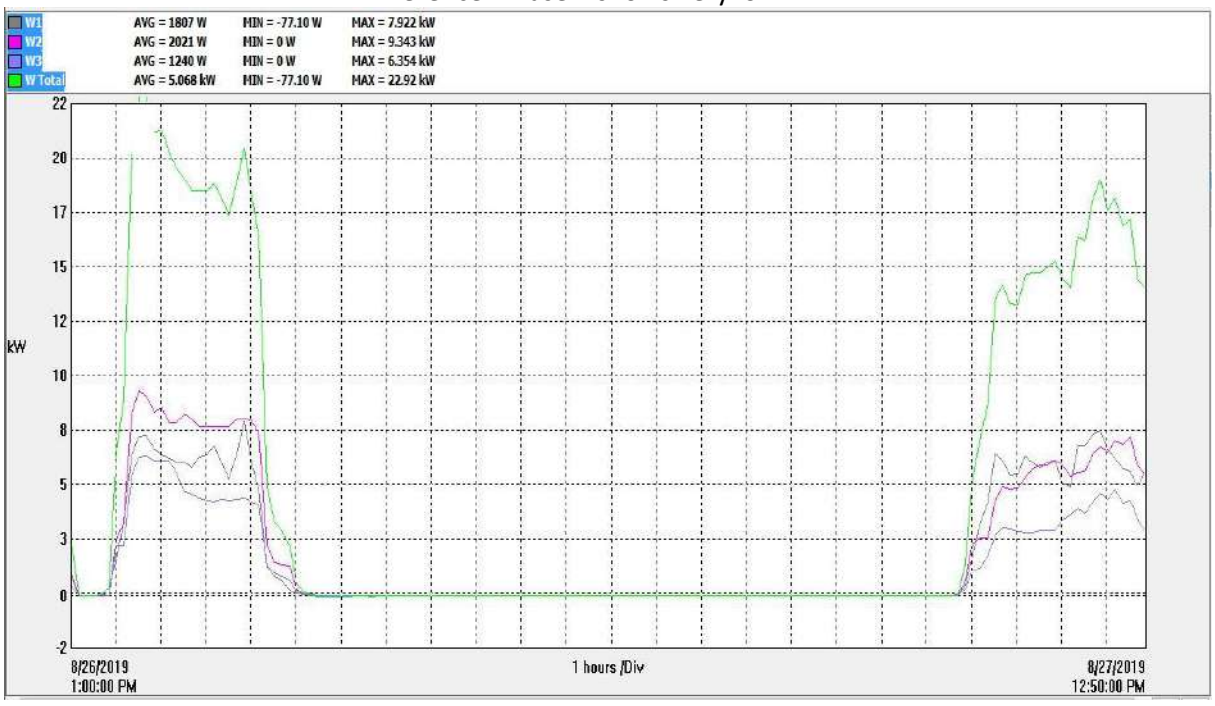

Fig.120 Shows the power (kW) for 24 hours from 26/8/2019 1.00PM to 27/8/2019 12.50PM

Inference: Power distribution is not balanced. Phase 3 is found to be unbalance. It is loaded only 26% of the total.

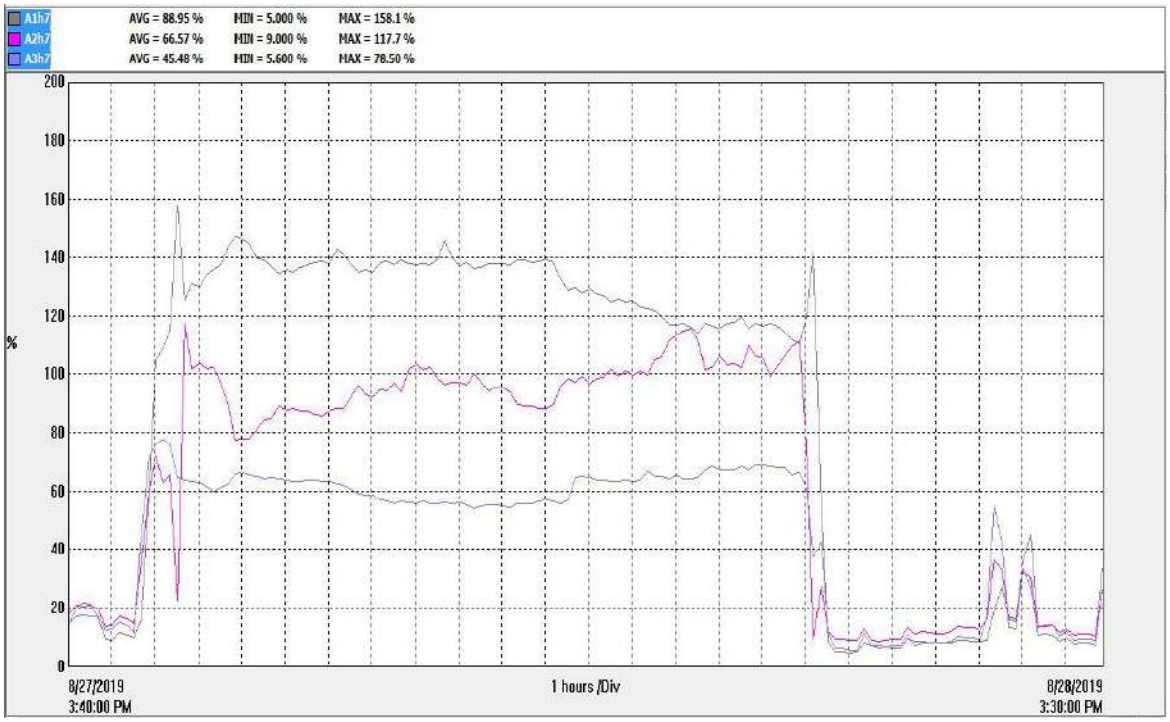

Fig.121 Shows the 7th order THD (voltage harmonics) for 24 hours from 27/8/2019 3.40PM to 28/8/2019 3.30PM

Inference: As THD is high, it is recommended to have harmonic filter as preventive measure against equipment failures.

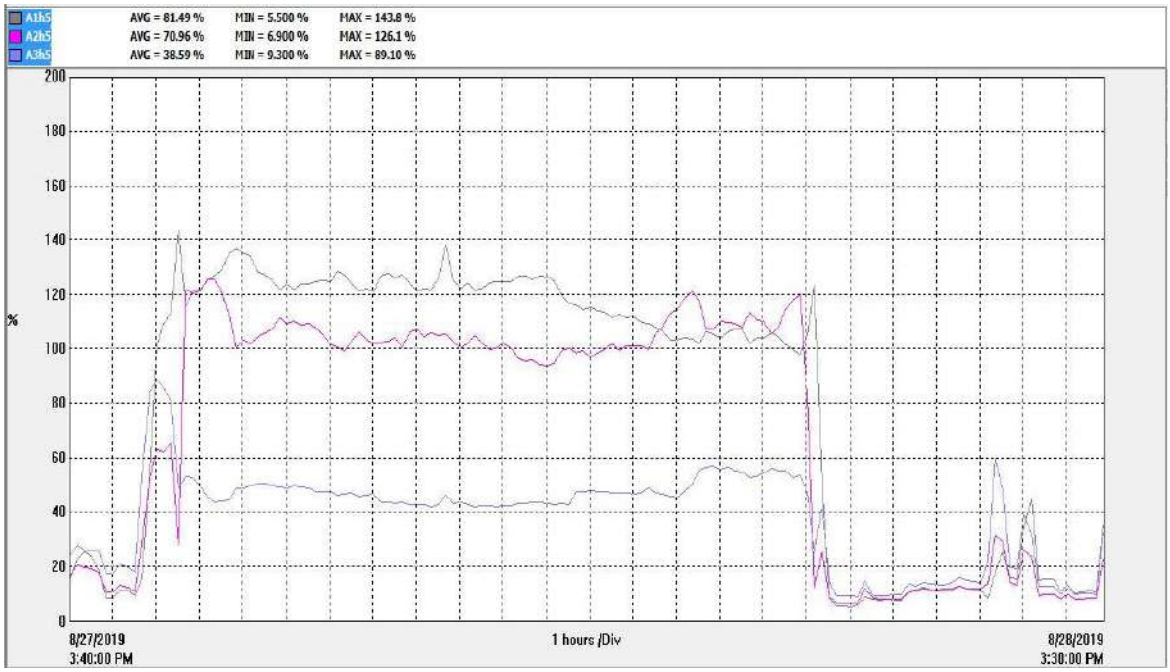

Fig.122 Shows the 5th order THD (voltage harmonics) for 24 hours from 27/8/2019 3.40PM to 28/8/2019 3.30PM

Inference: As THD is high, it is recommended to have harmonic filter as preventive measure against equipment failures.

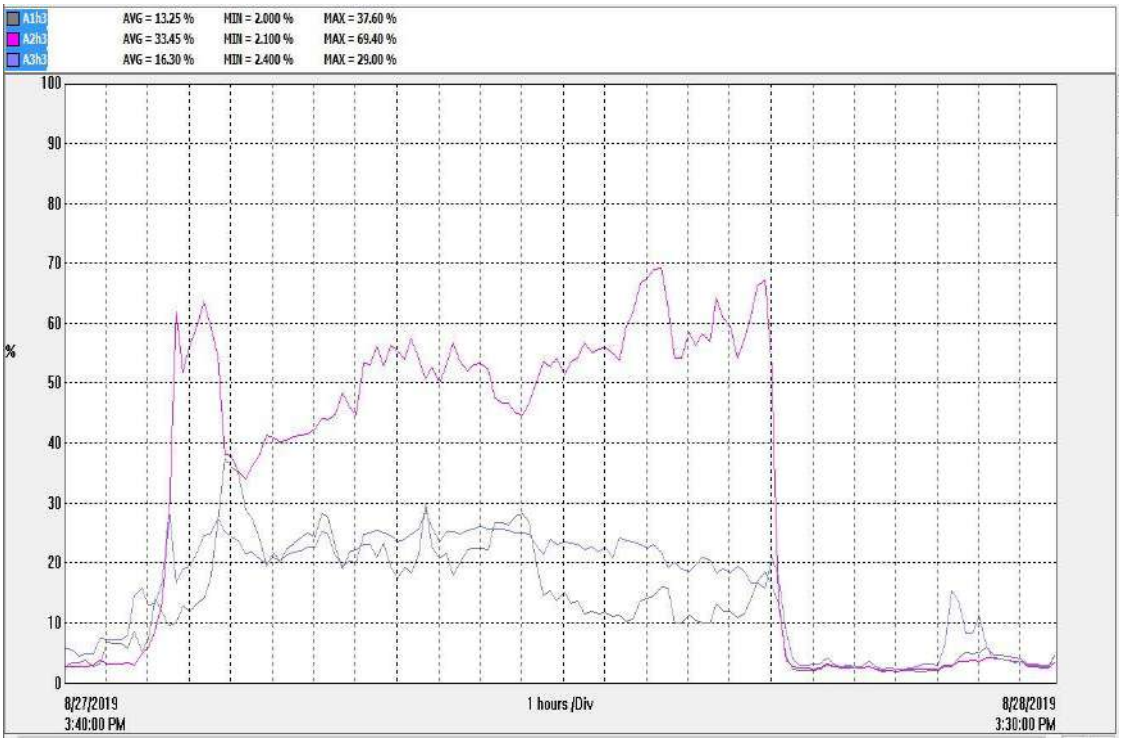

Fig.123 Shows the 3th order THD (voltage harmonics) for 24 hours from 27/8/2019 3.40PM to 28/8/2019 3.30PM

Inference: As THD is high, it is recommended to have harmonic filter as preventive measure against equipment failures.

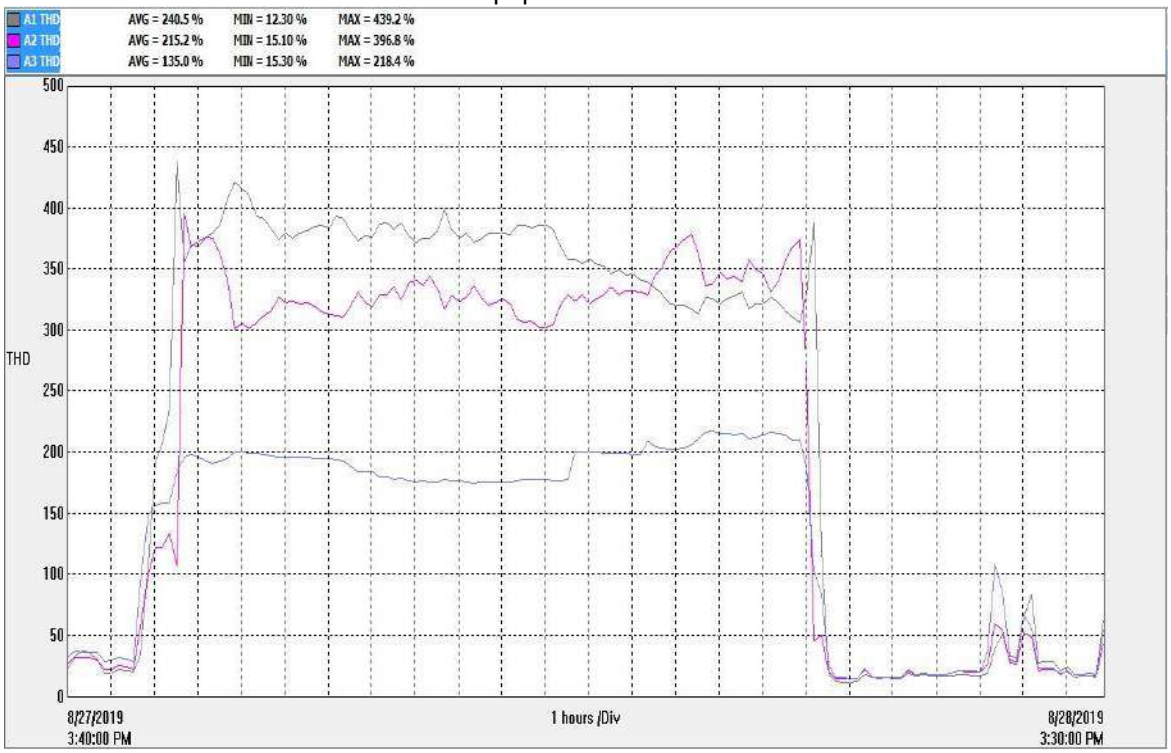

Fig.124 Shows the THD (voltage harmonics) for 24 hours from 27/8/2019 3.40PM to 28/8/2019 3.30PM

Inference: As THD is high, it is recommended to have harmonic filter as preventive measure against equipment failures.

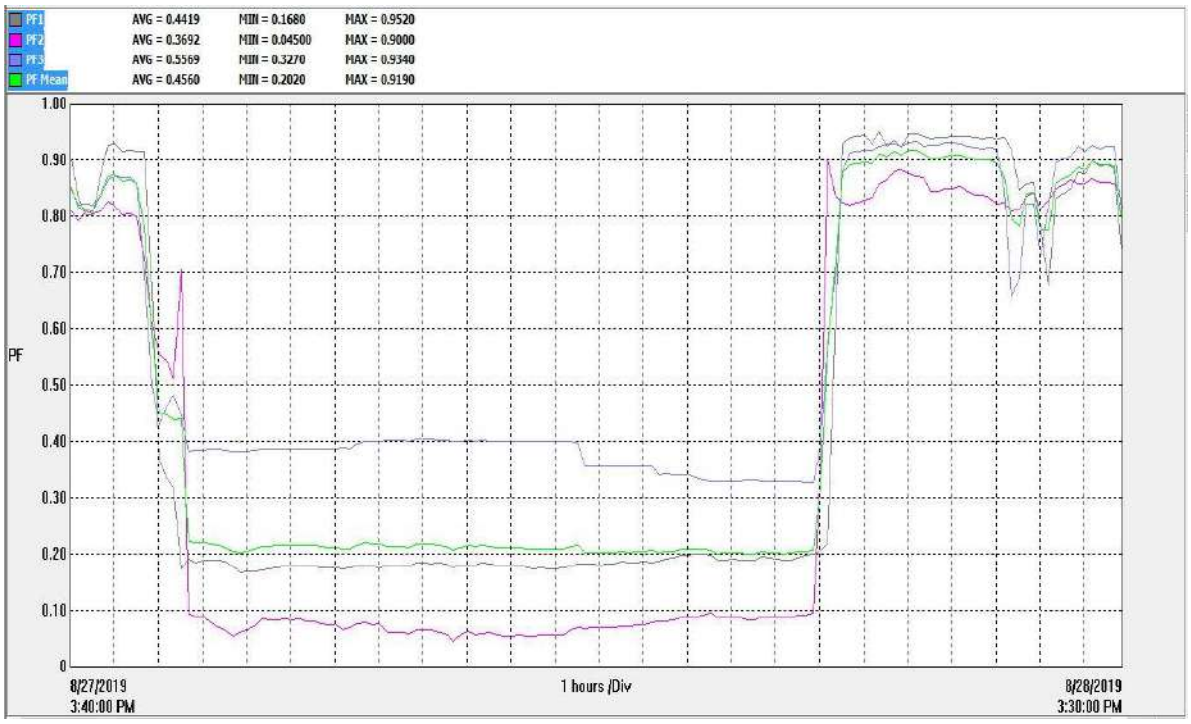

Fig.125 Shows the power factor (PF) for 24 hours from 27/8/2019 3.40PM to 28/8/2019 3.30PM
Inference: No unbalanced found here. Need to improve PF.

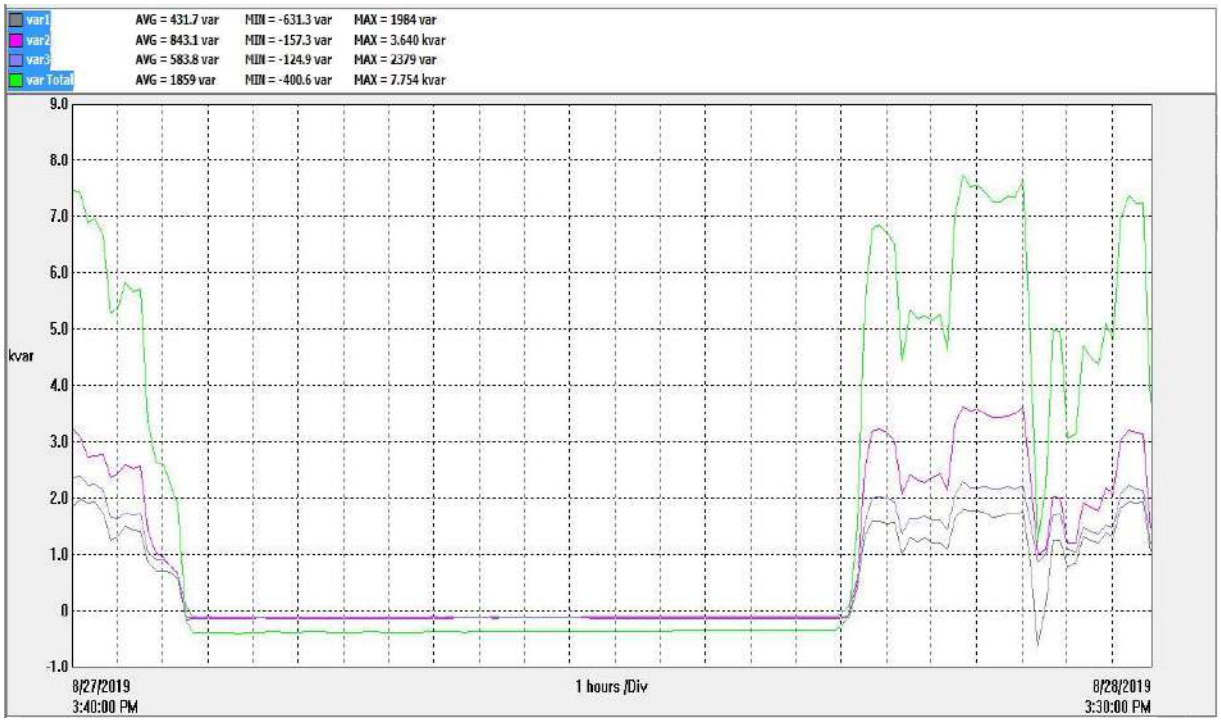

Fig.126 Shows the power factor (PF) for 24 hours from 27/8/2019 3.40PM to 28/8/2019 3.30PM
Inference: Phase 1 shows very low KVAR compare to other two phases.

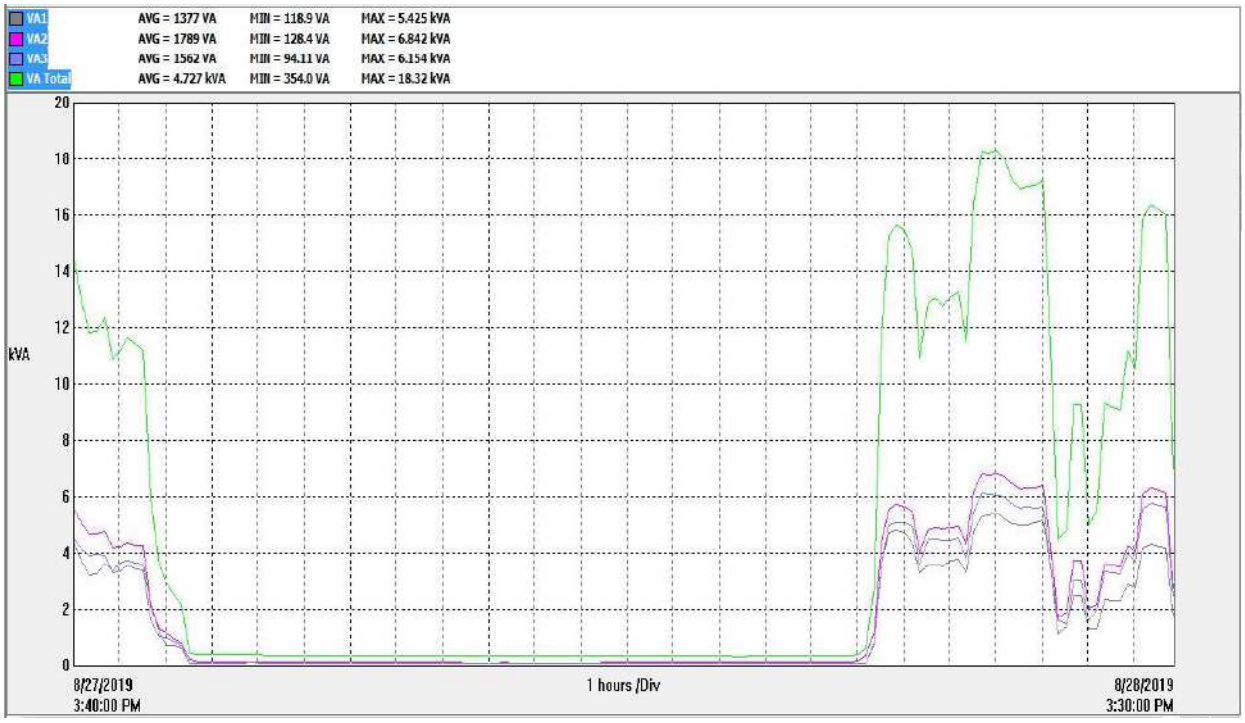

Fig.127 Shows the reactive power (kVAR) for 24 hours from 27/8/2019 3.40PM to 28/8/2019 3.30PM
Inference: Phase 1 shows very low KVA.

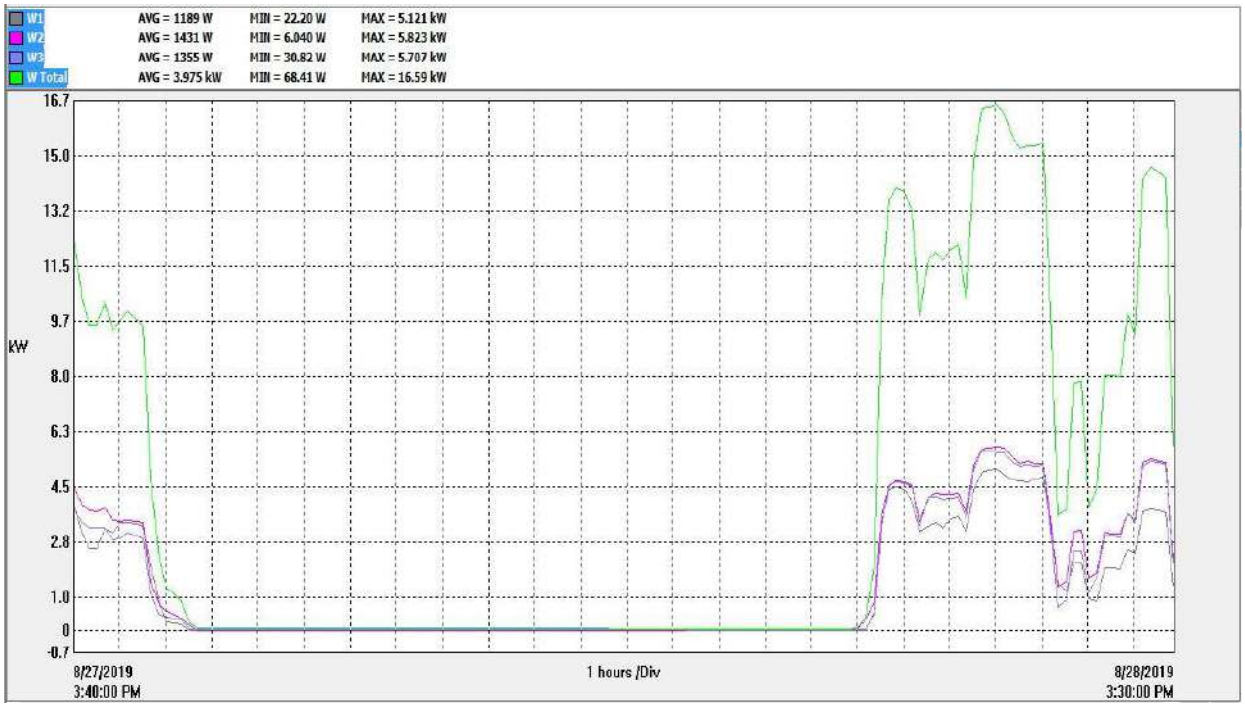

Fig.128 Shows the power (kW) for 24 hours from 27/8/2019 3.40PM to 28/8/2019 3.30PM
Inference: Power distribution is not balanced. Phase 1 is found to be unbalance. It is loaded only 30% of the total.

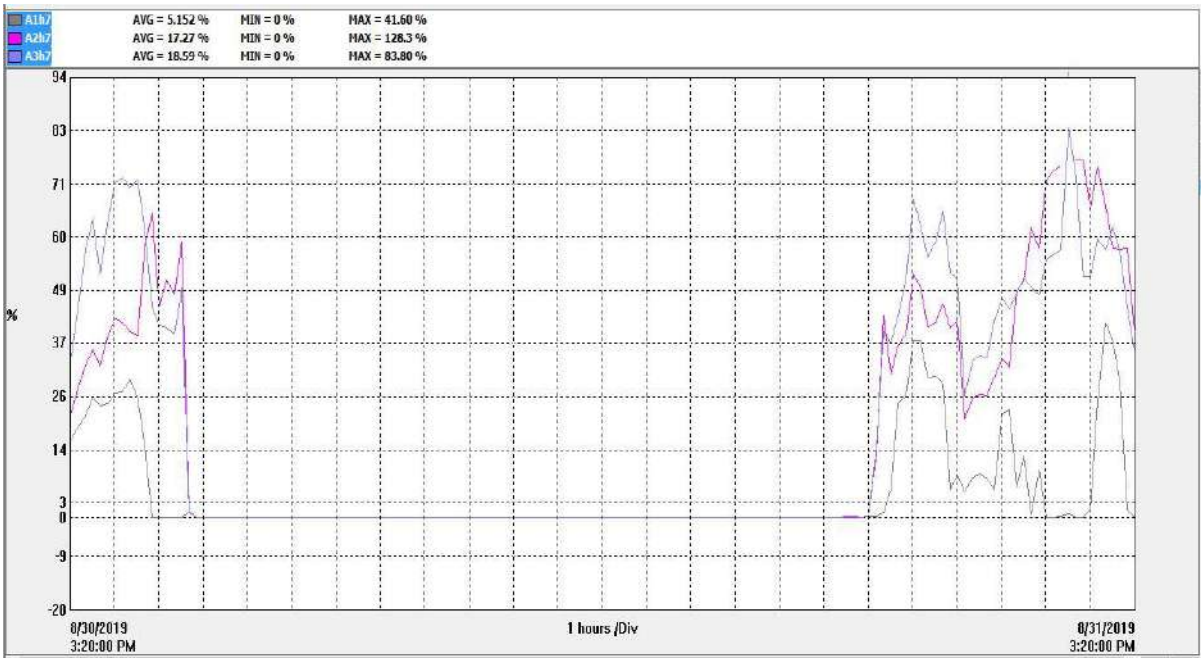

Fig.129 Shows the 7th order THD (voltage harmonics) for 24 hours from 30/8/2019 3.20PM to 31/8/2019 3.20PM

Inference: Harmonics seems to be normal. No need of harmonic filters.

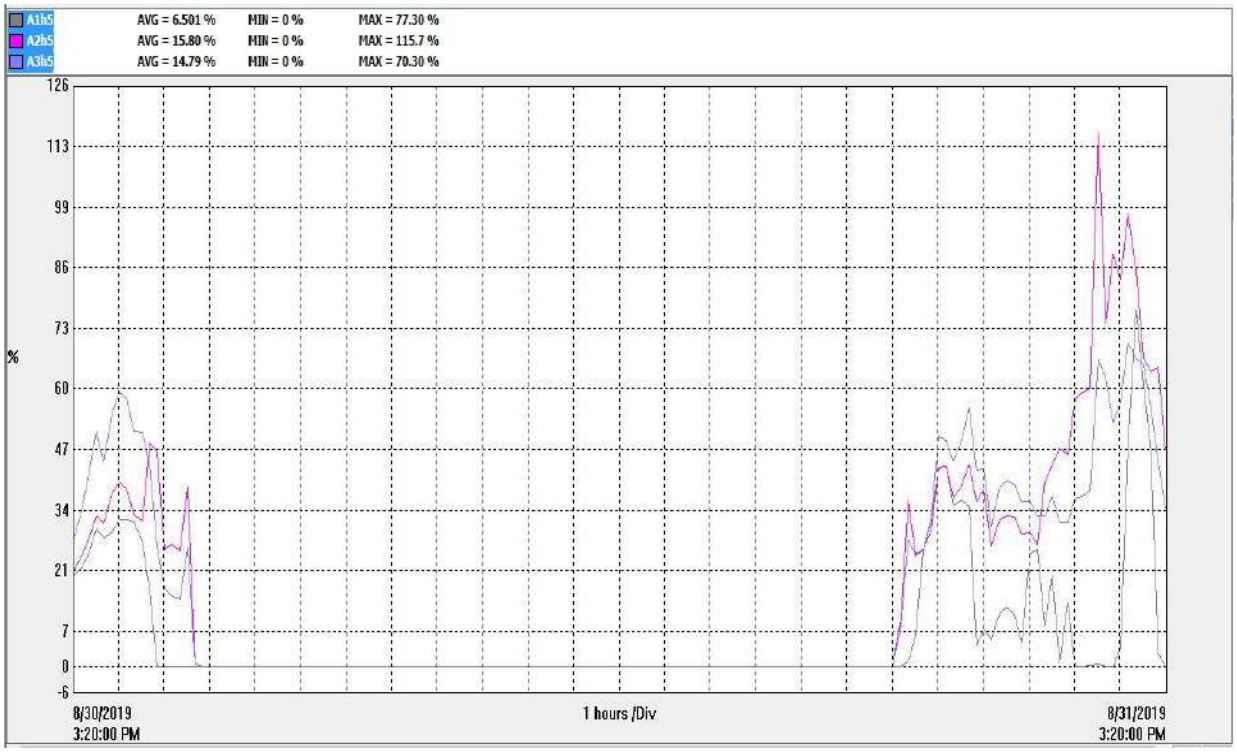

Fig.130 Shows the 5th order THD (voltage harmonics) for 24 hours from 30/8/2019 3.20PM to 31/8/2019 3.20PM

Inference: Harmonics seems to be normal. No need of harmonic filters.

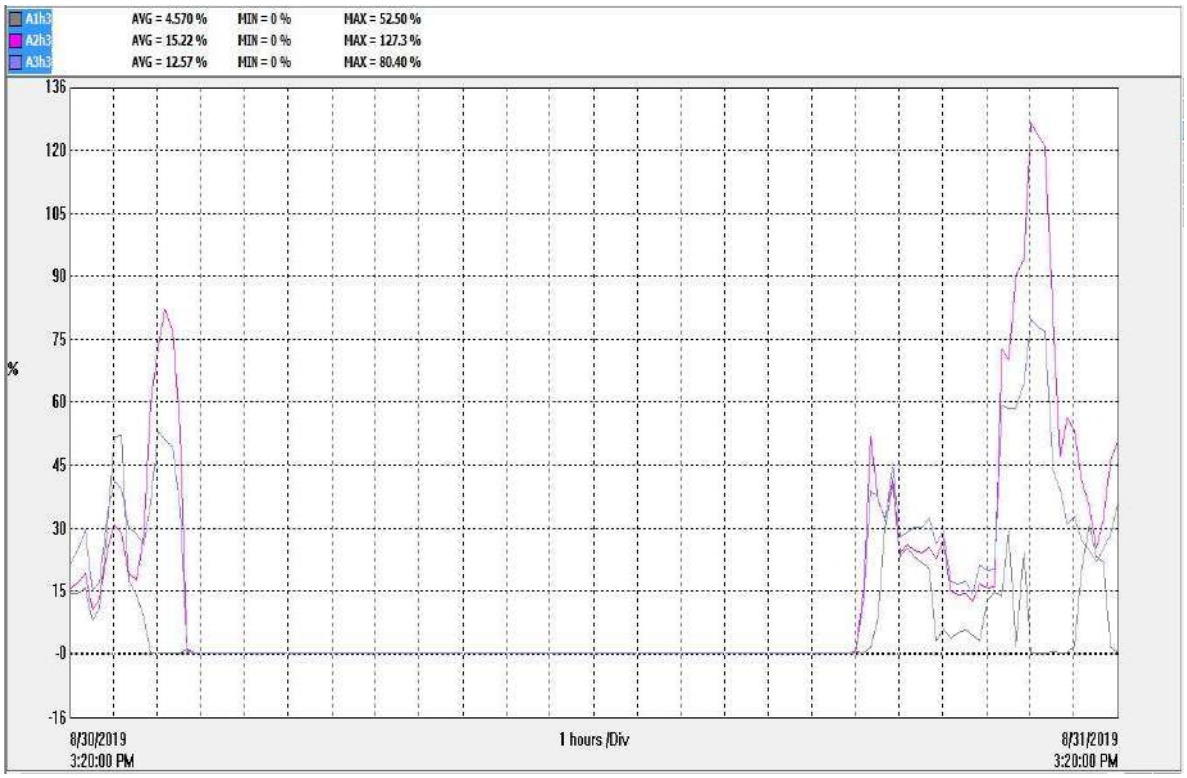

Fig.131 Shows the 7th order THD (voltage harmonics) for 24 hours from 30/8/2019 3.20PM to 31/8/2019 3.20PM

Inference: Harmonics seems to be normal. No need of harmonic filters.

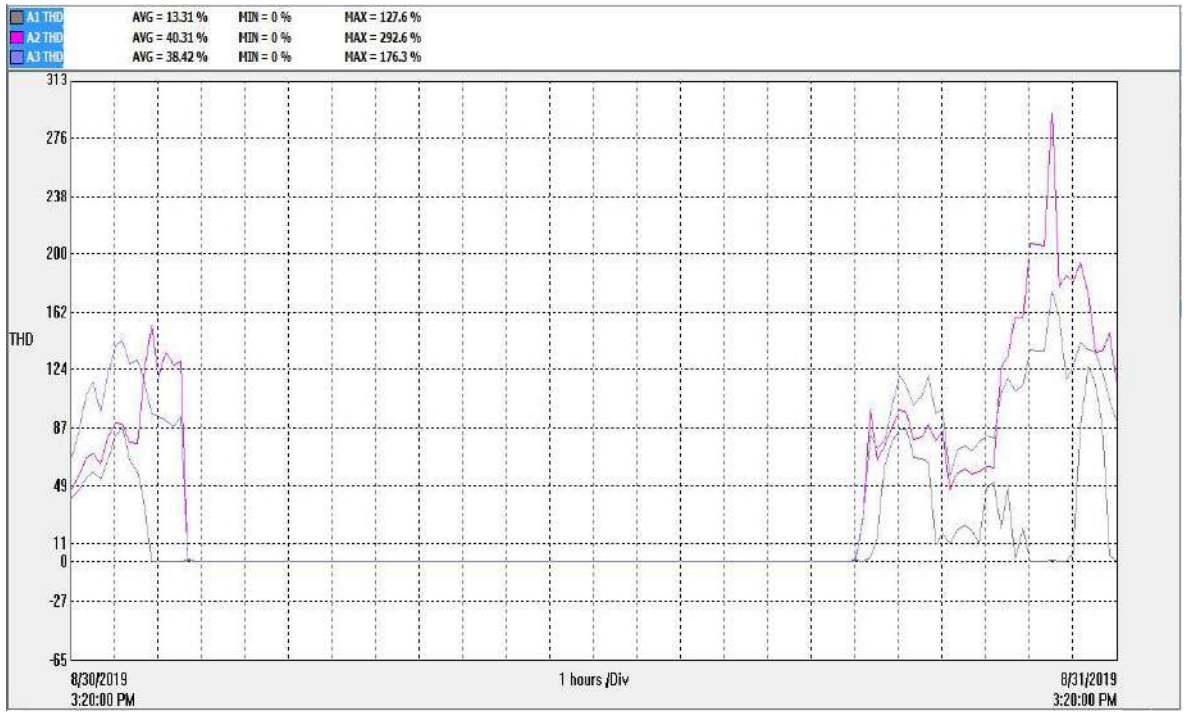

Fig.132 Shows the THD (voltage harmonics) for 24 hours from 30/8/2019 3.20PM to 31/8/2019 3.20PM

Inference: As THD is high, it is recommended to have harmonic filter as preventive measure against equipment failures.

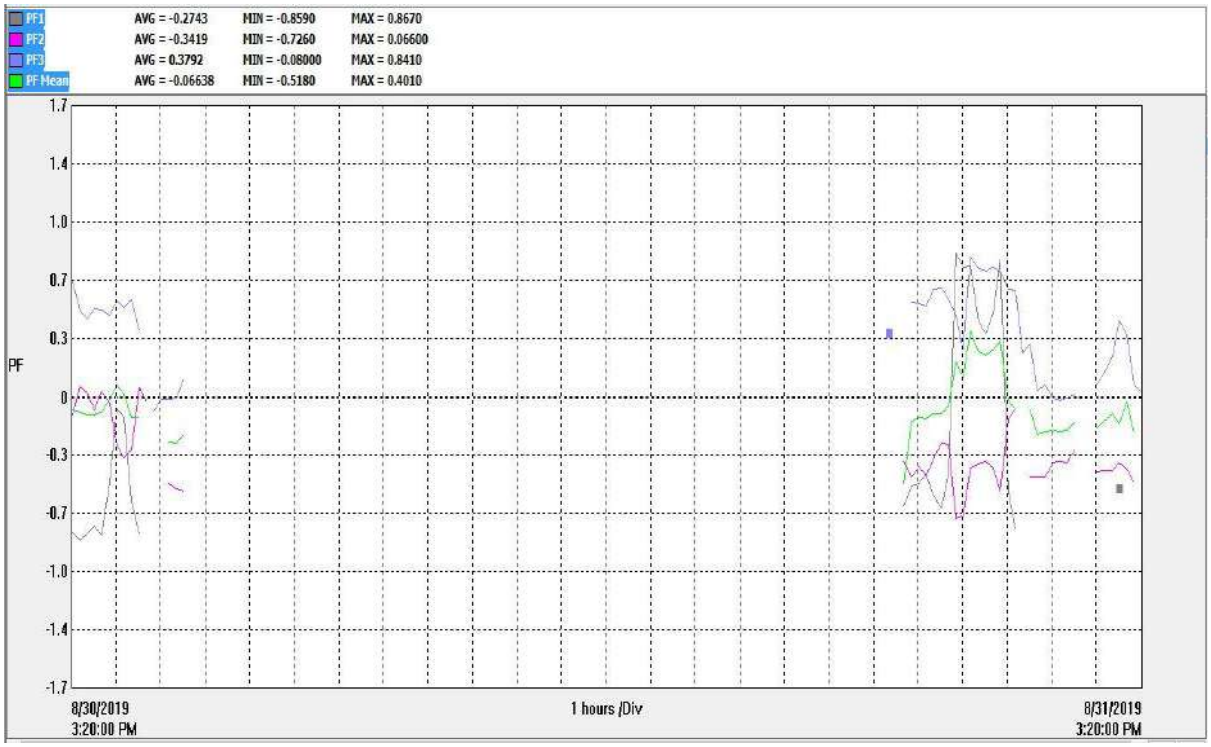

Fig.133 Shows the power factor (PF) for 24 hours from 30/8/2019 3.20PM to 31/8/2019 3.20PM
Inference: No unbalanced found here. Need to improve PF.

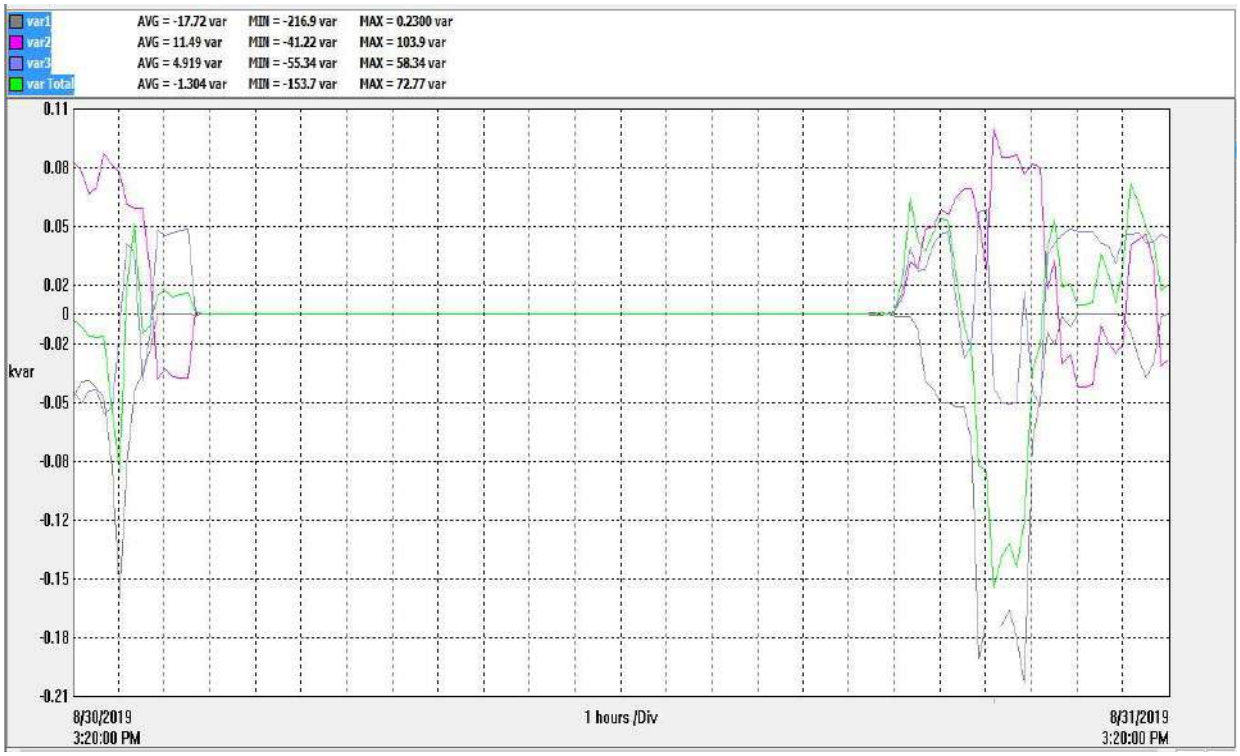

Fig.134 Shows the power factor (PF) for 24 hours from 30/8/2019 3.20PM to 31/8/2019 3.20PM
Inference: Phase 1 shows very KVAR compare to other two phases.

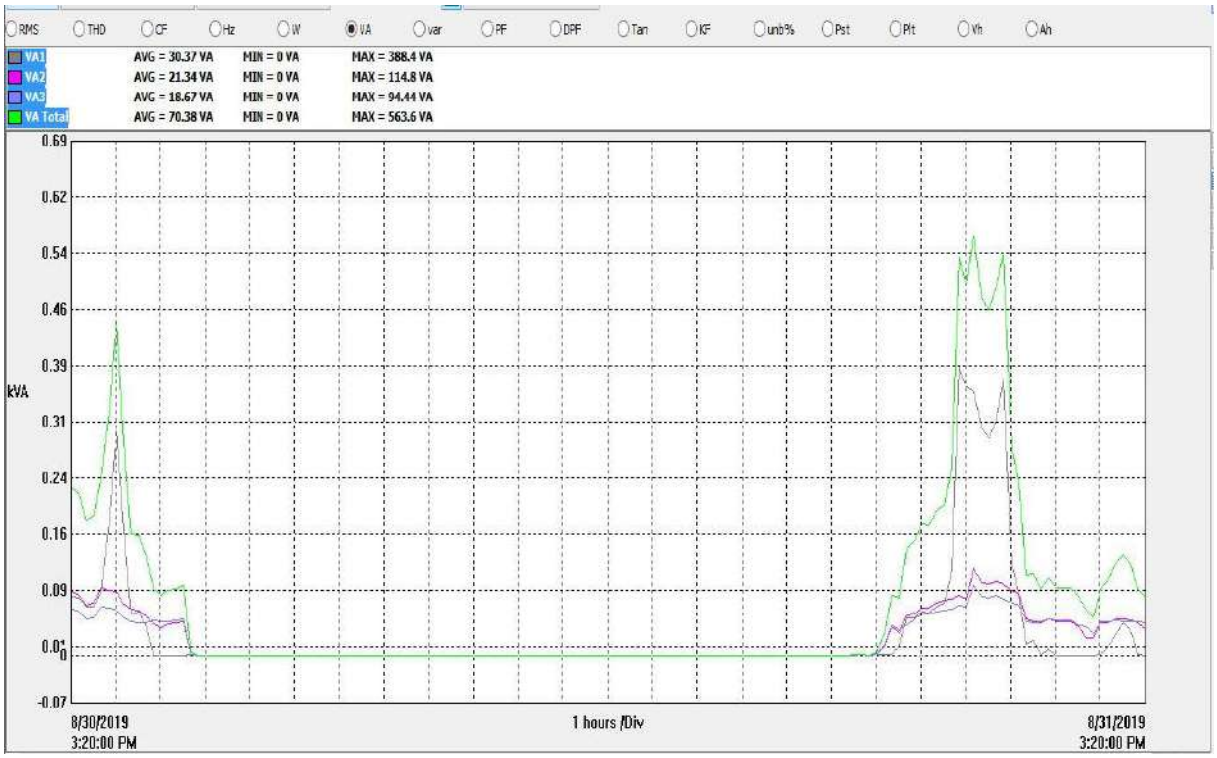

Fig.135 Shows the power (kVA) for 24 hours from 30/8/2019 3.20PM to 31/8/2019 3.20PM
Inference: Phase 3 shows very low KVA.

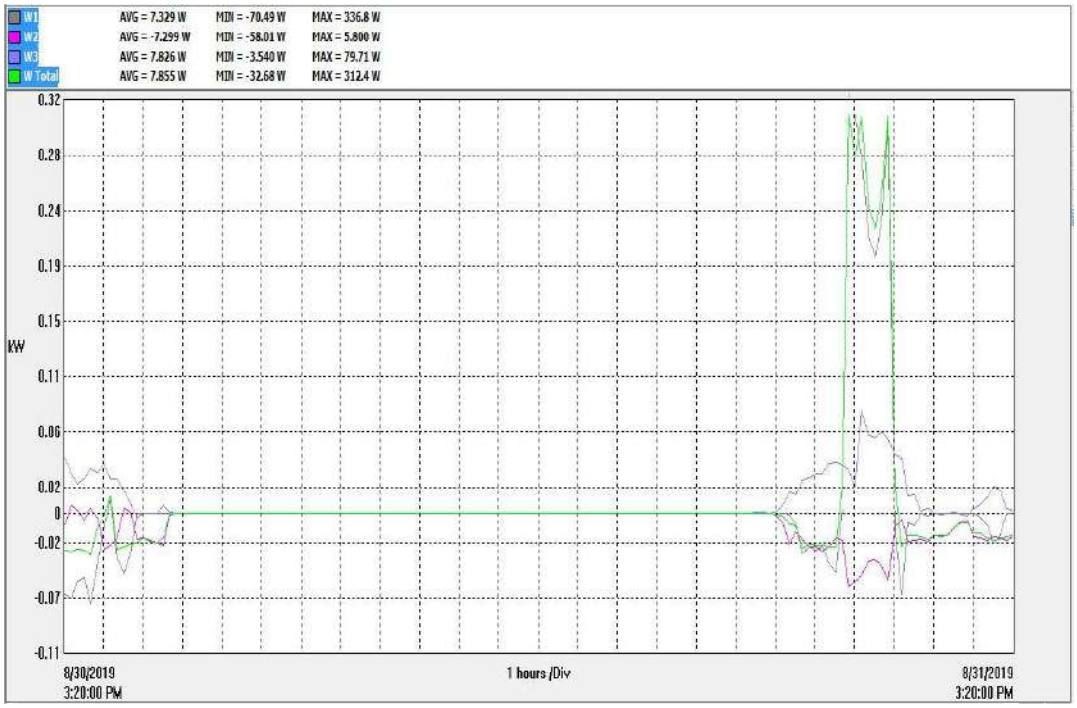

Fig.136 Shows the power (kW) for 1.50 hours from 30/8/2019 3.20PM to 31/8/2019 3.20PM
Inference: There is no unbalance conditions.

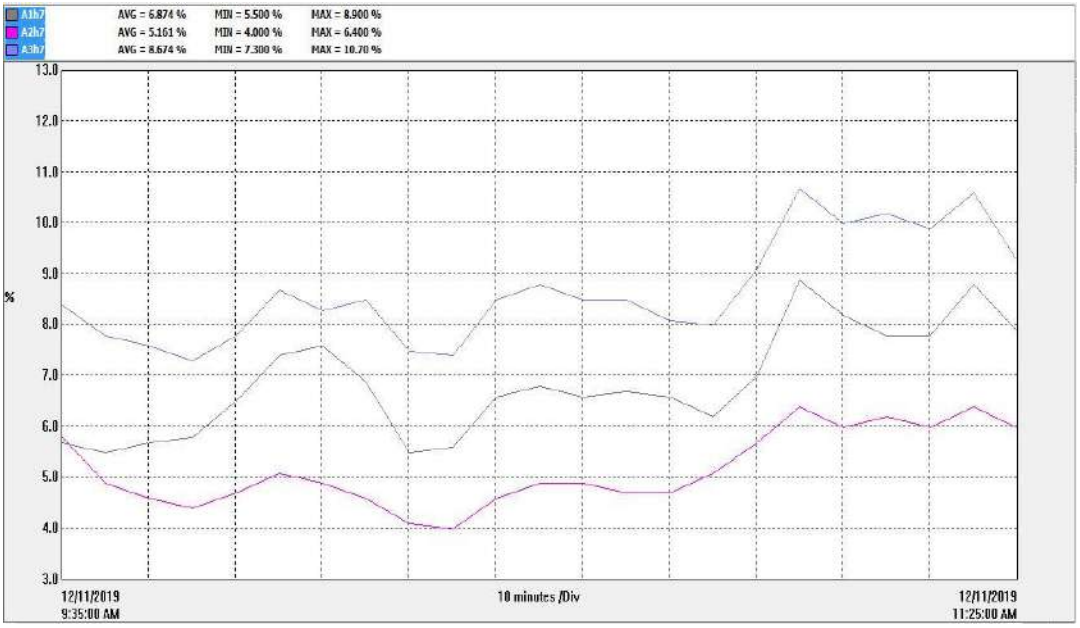

Fig.137 shows the 7th order THD (voltage harmonics) for 1.95 hours from 11/12/8/2019 9.35AM to 11/12/2019 11.25AM

Inference: Harmonics seems to be normal. No need of harmonic filters.

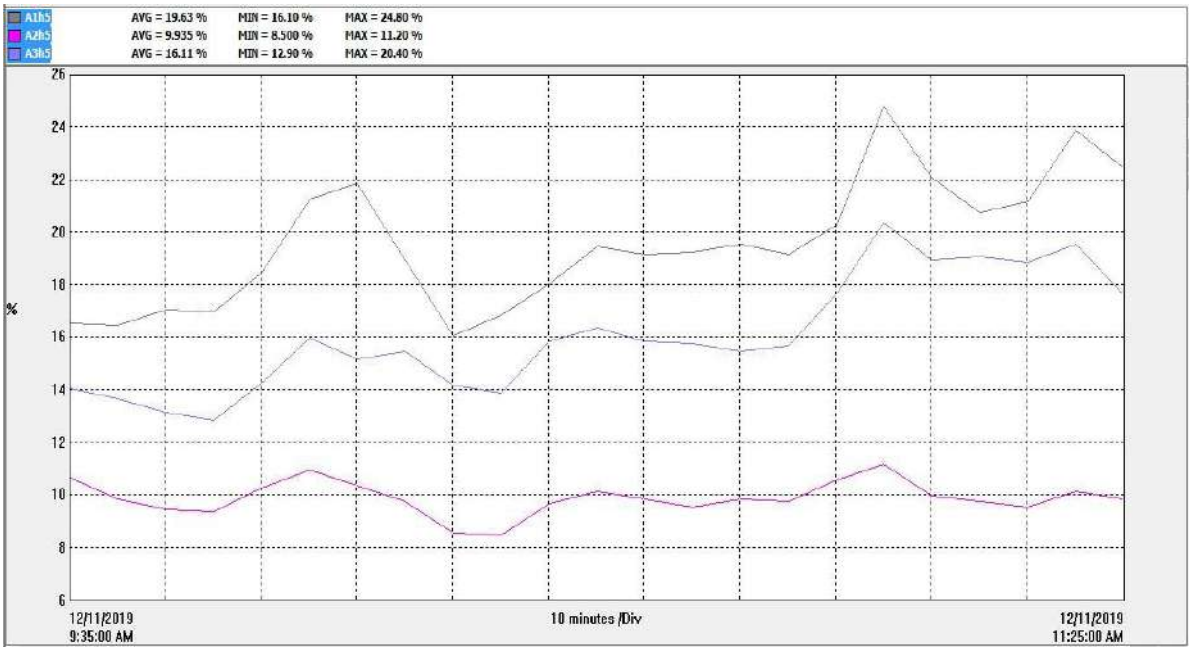

Fig.138 Shows the 7th order THD (voltage harmonics) for 1.95 hours from 11/12/8/2019 9.35AM to 11/12/2019 11.25AM

Inference: Harmonics seems to be normal. No need of harmonic filters.

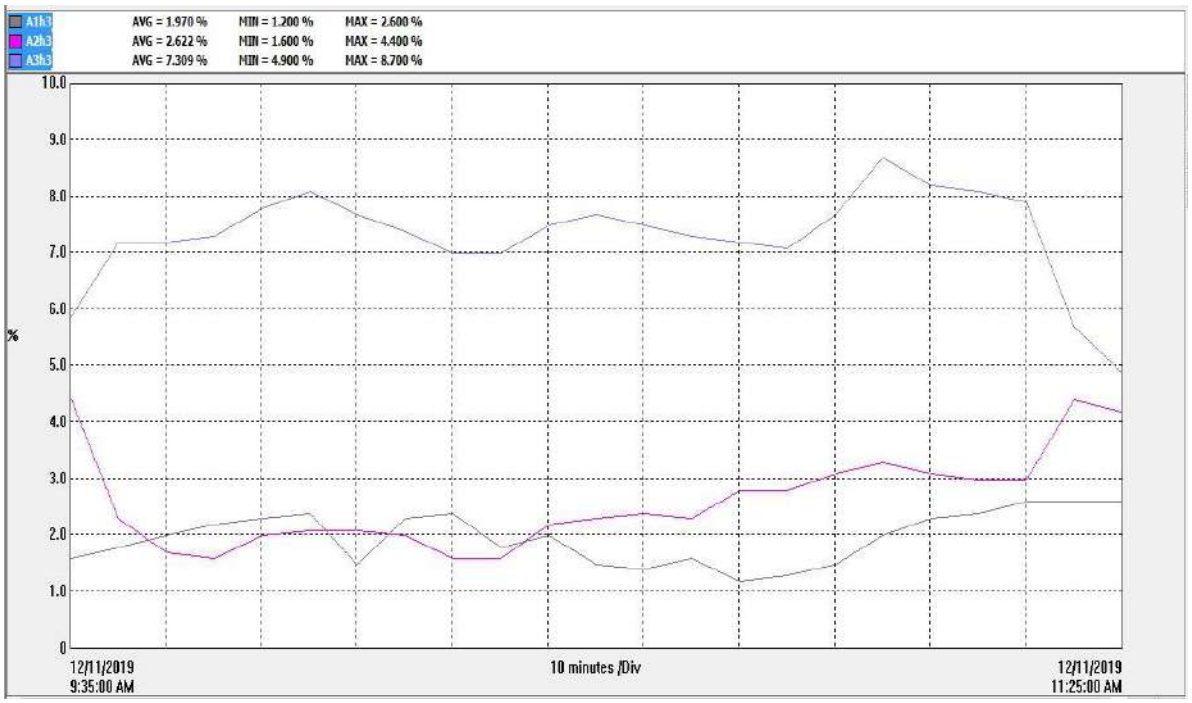

Fig.139 Shows the 7th order THD (voltage harmonics) for 1.95 hours from 11/12/8/2019 9.35AM to 11/12/2019 11.25AM

Inference: Harmonics seems to be normal. No need of harmonic filters.

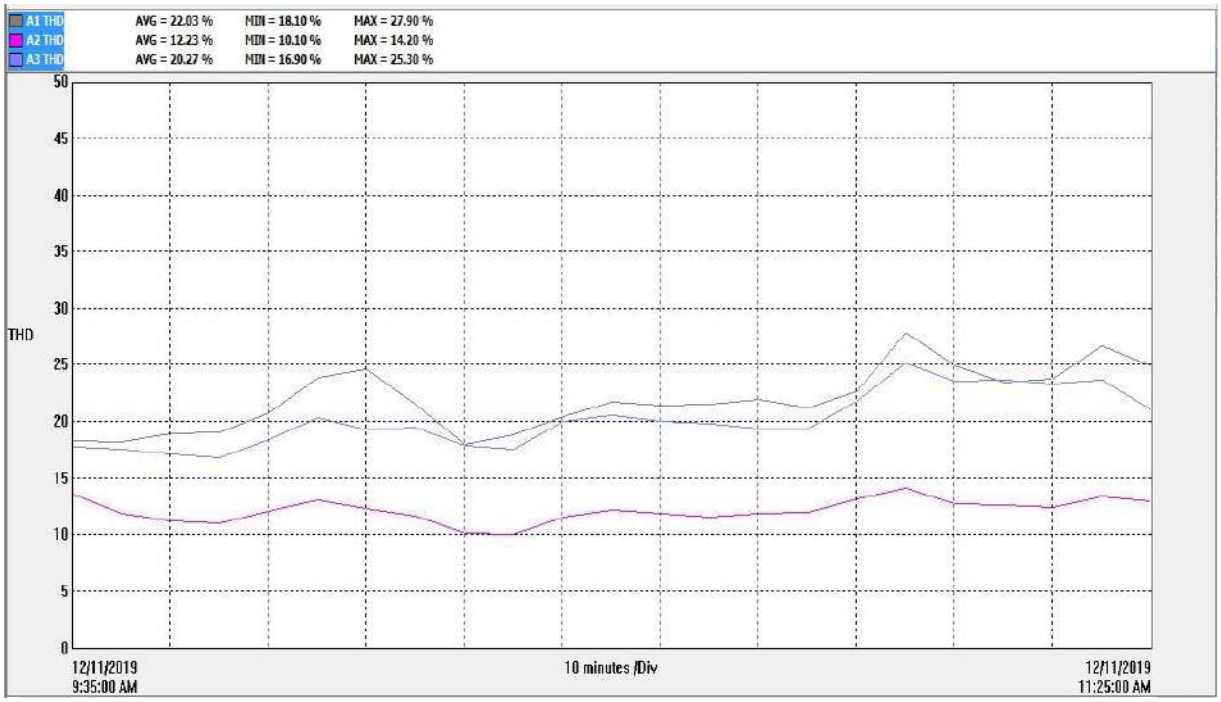

Fig.140 Shows the THD (voltage harmonics) for 1.95 hours from 11/12/2019 9.35AM to 11/12/2019 11.25AM

Inference: THD is high, it is recommended to have harmonic filter as preventive measure against equipment failures.

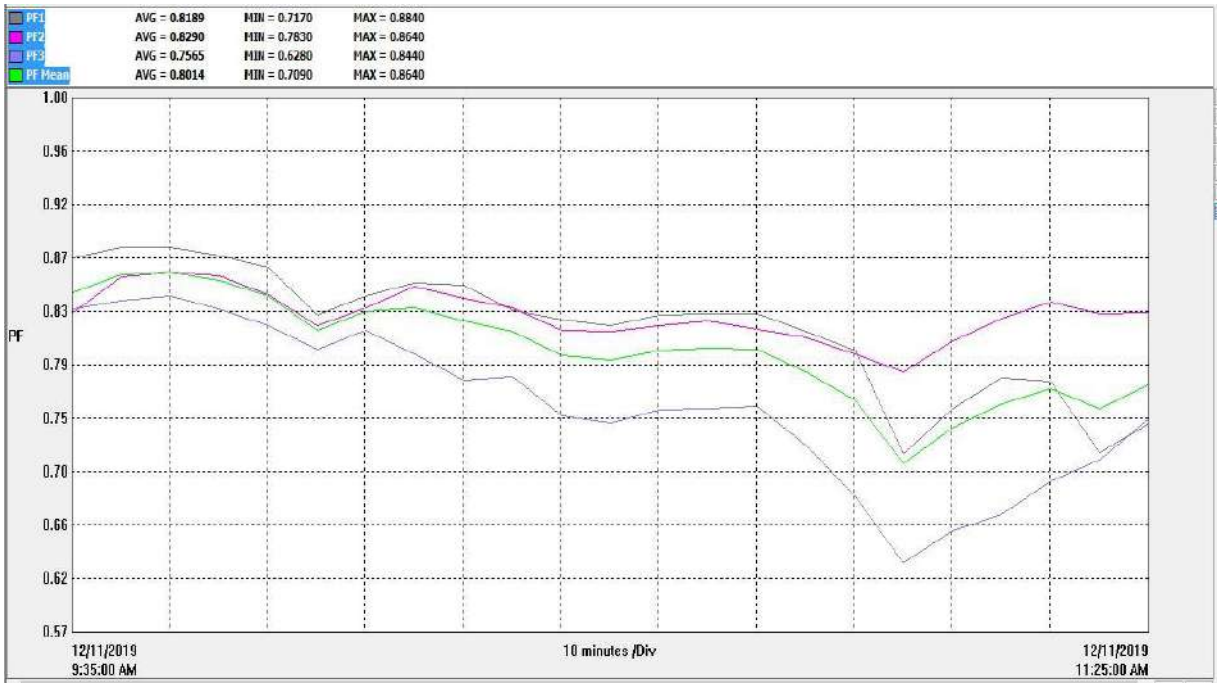

Fig.141 Shows the power factor (PF) for 1.95 hours from 11/12/2019 9.35AM to 11/12/2019 11.25AM

Inference: No unbalanced found here. Need to improve PF.

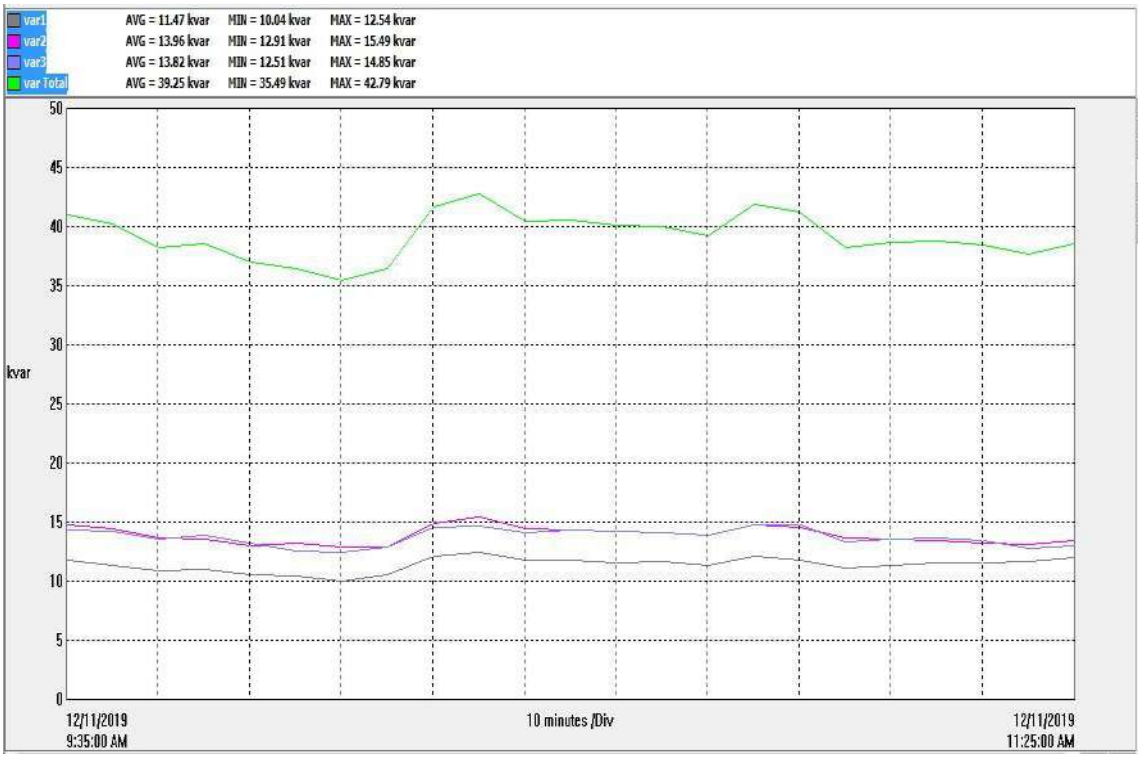

Fig.142 Shows the reactive power (kVAR) for 1.95 hours from 11/12/2019 9.35AM to 11/12/2019 11.25PM

Inference: Phase 1 shows abnormal conditions.

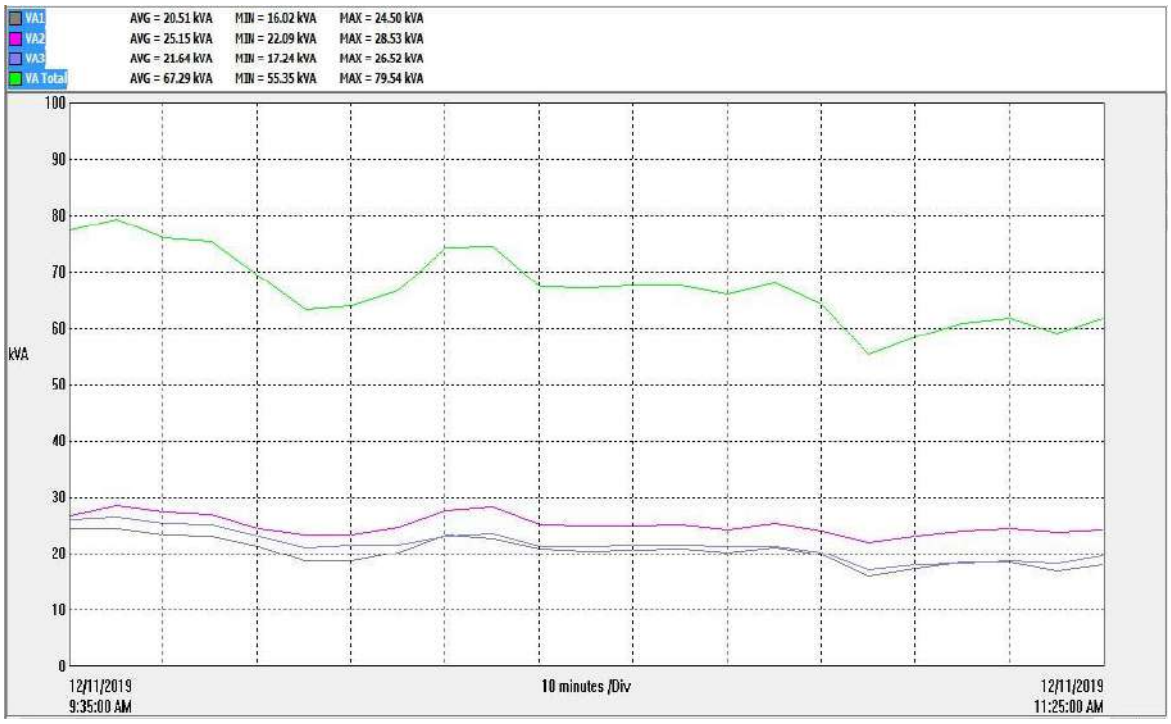

Fig.143 Shows the reactive power (kVAR) for 1.95 hours from 11/8/2019 9.30AM to 11/12/2019 11.25PM

Inference: Phase 3 shows higher KVA than other two phases.

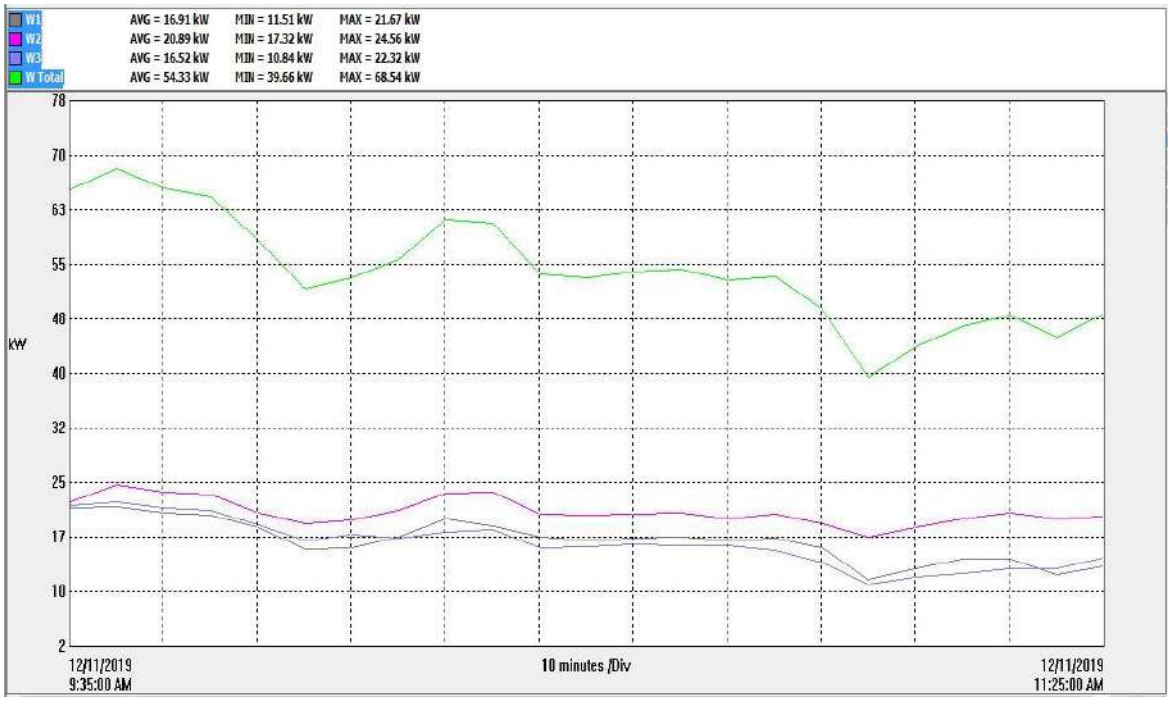

Fig.144 Shows the power (kW) for 1.95 hours from 11/12/2019 9.35AM to 11/12/2019 11.25AM

Inference: Power distribution is not balanced. Phase 3 is found to be unbalanced and it loaded only 30% of the total.

ADMIN BLOCK

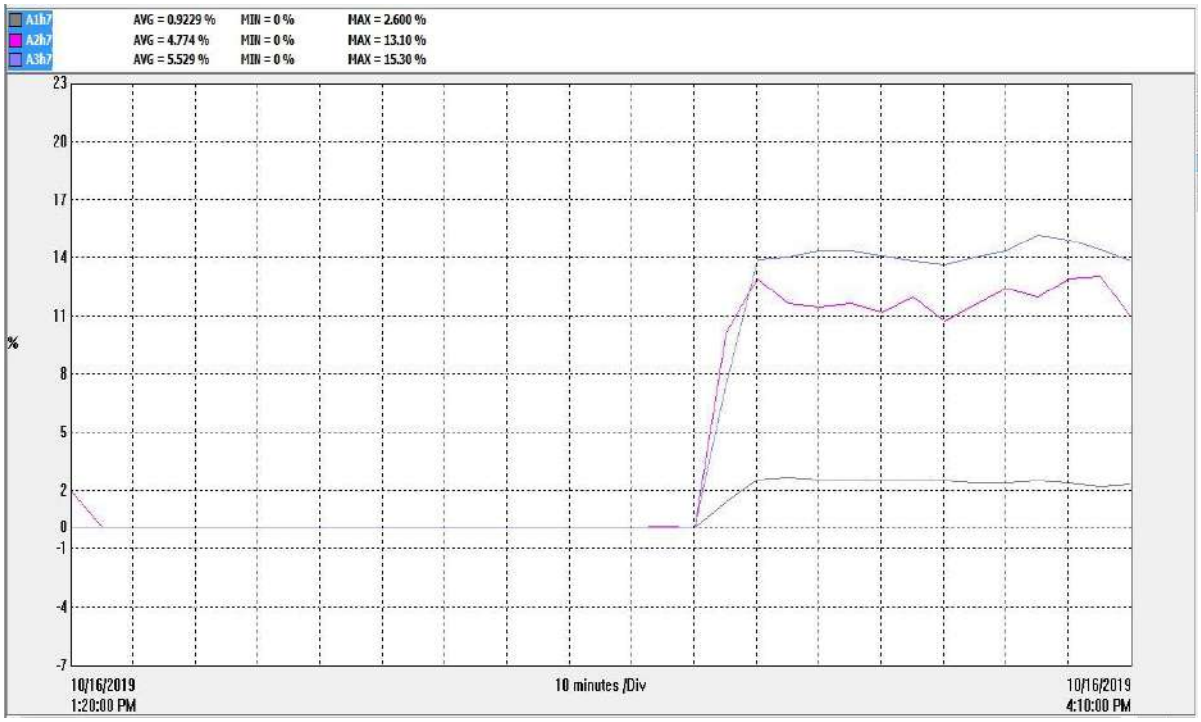

Fig.145 Shows the 7th order THD (voltage harmonics) for 4.10 hours from 16/10/8/2019 1.20PM to 16/10/2019 4.10PM

Inference: Harmonics seems to be normal. No need of harmonic filters.

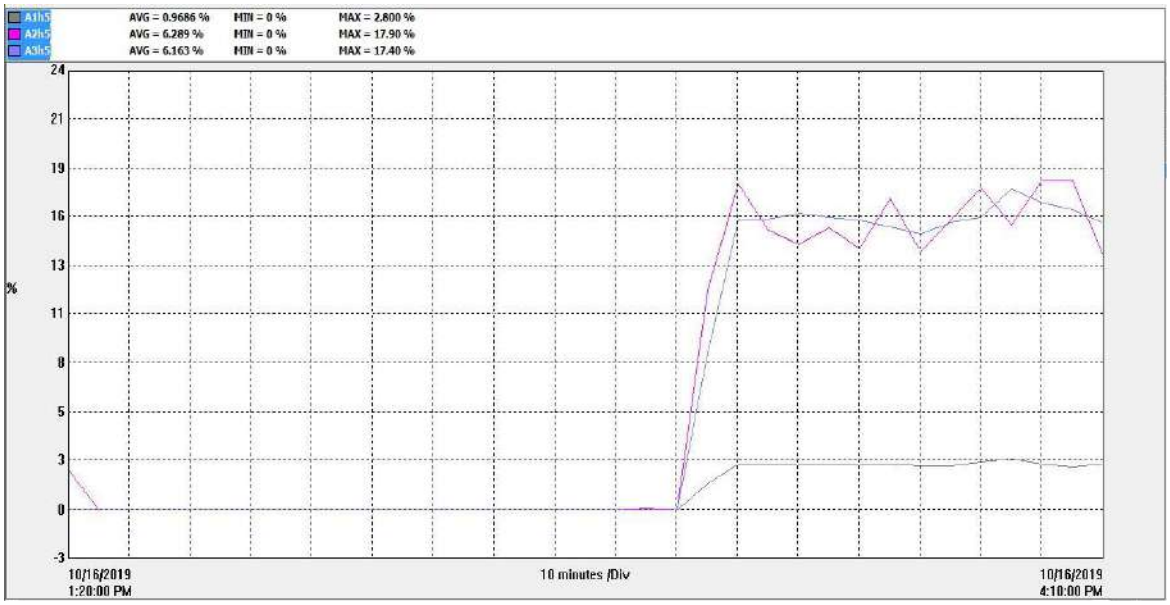

Fig.146 Shows the 5th order THD (voltage harmonics) for 3.10 hours from 16/10/8/2019 12.00PM to 16/10/2019 4.10PM

Inference: Harmonics seems to be normal. No need of harmonic filters.

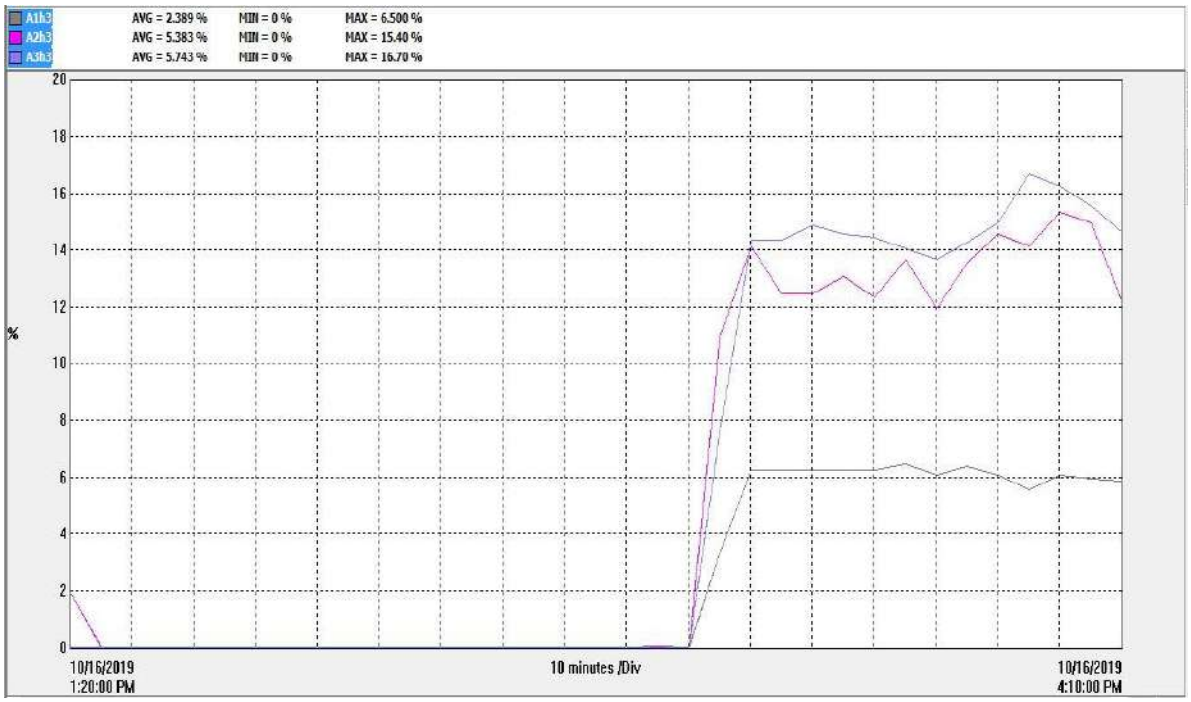

Fig.147 Shows the 3th order THD (voltage harmonics) for 3.10 hours from 16/10/8/2019 12.00PM to 16/10/2019 4.10PM

Inference: Harmonics seems to be normal. No need of harmonic filters.

Fig.148 Shows the THD (voltage harmonics) for 3.10 hours from 16/10/2019 1.20PM to 16/10/2019 4.10PM

Inference: Harmonics seems to be normal. No need of harmonic filters.

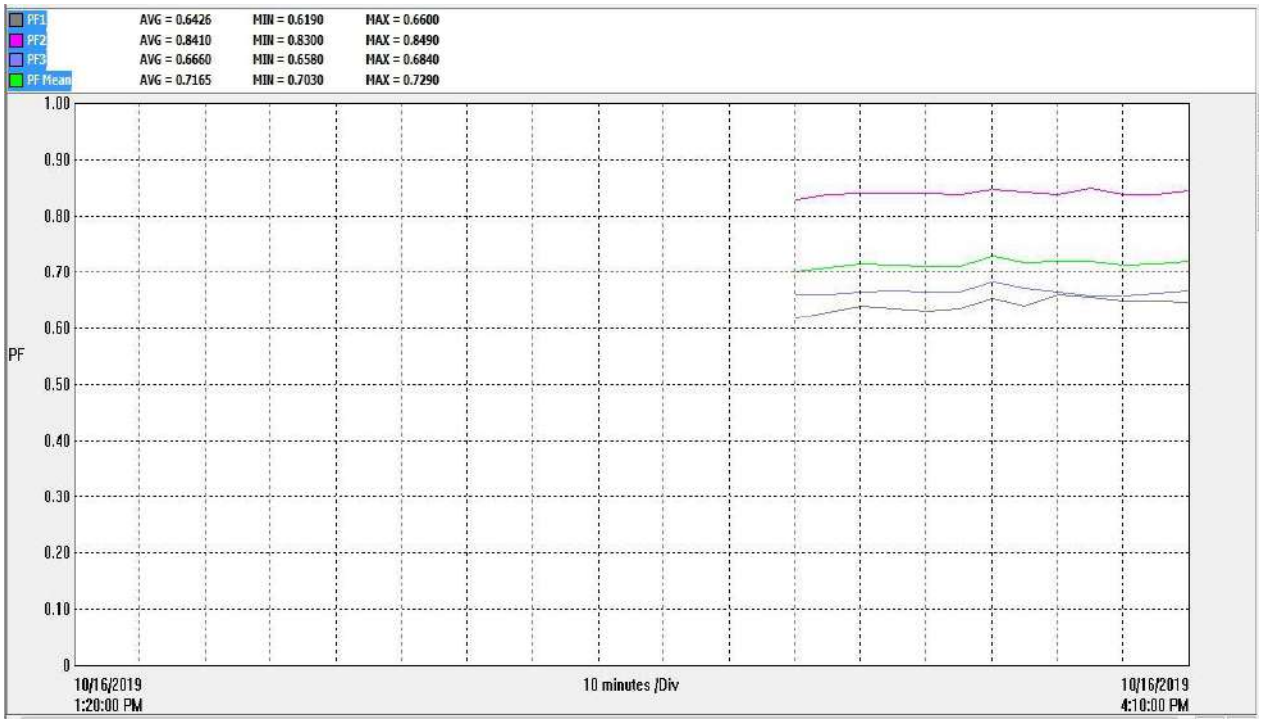

Fig.149 Shows the power factor (PF) for 3.10 hours from 16/10/2019 1.20PM to 16/10/2019 4.15AM

Inference: No unbalanced found here. Need to improve PF.

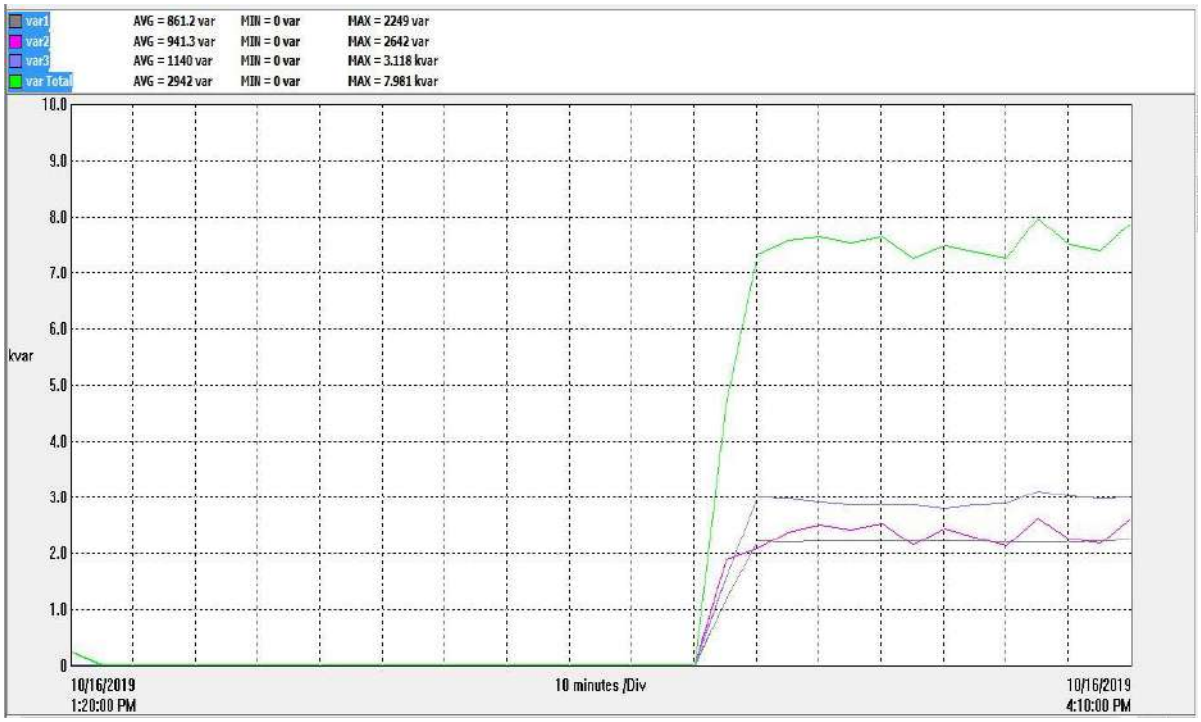

Fig.150 Shows the power factor (PF) for 3.10 hours from 16/10/2019 1.20PM to 16/10/2019 4.10PM

Inference: Phase 3 shows very low KVAR compare to other two phases.

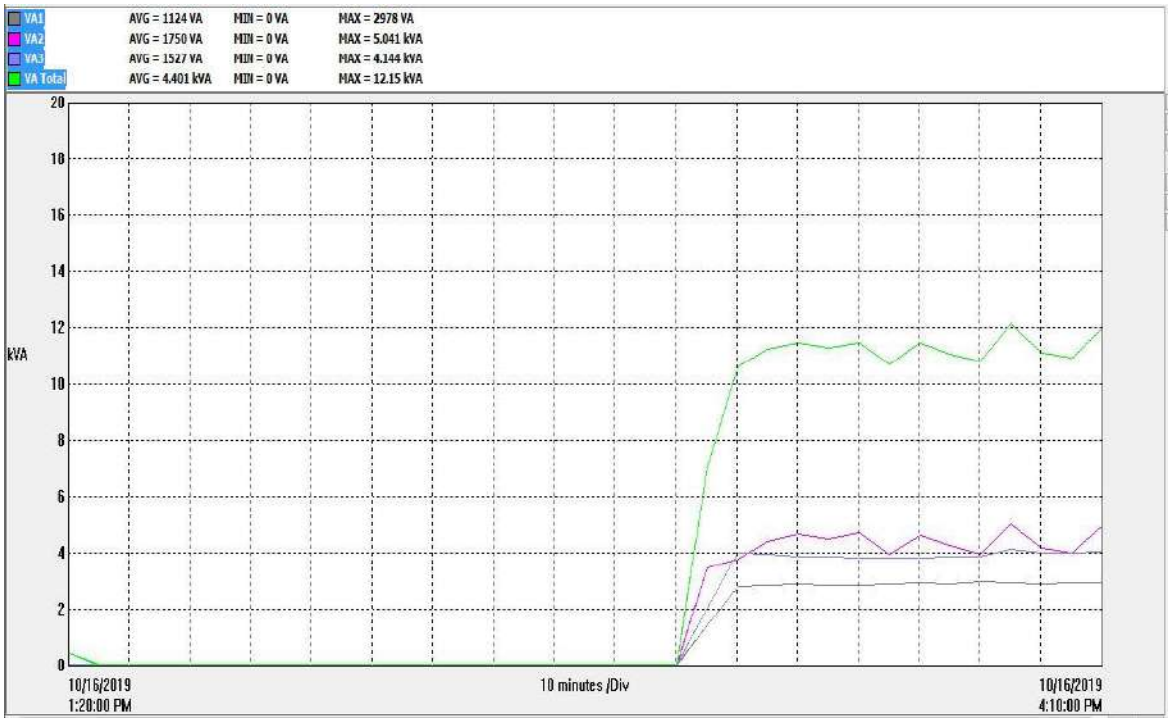

Fig.151 Shows the reactive power (kVAR) for 3.10hours from161/10/2019 1.20PM to 16/10/2019 4.10PM

Inference: Phase 1 shows very low KVA.

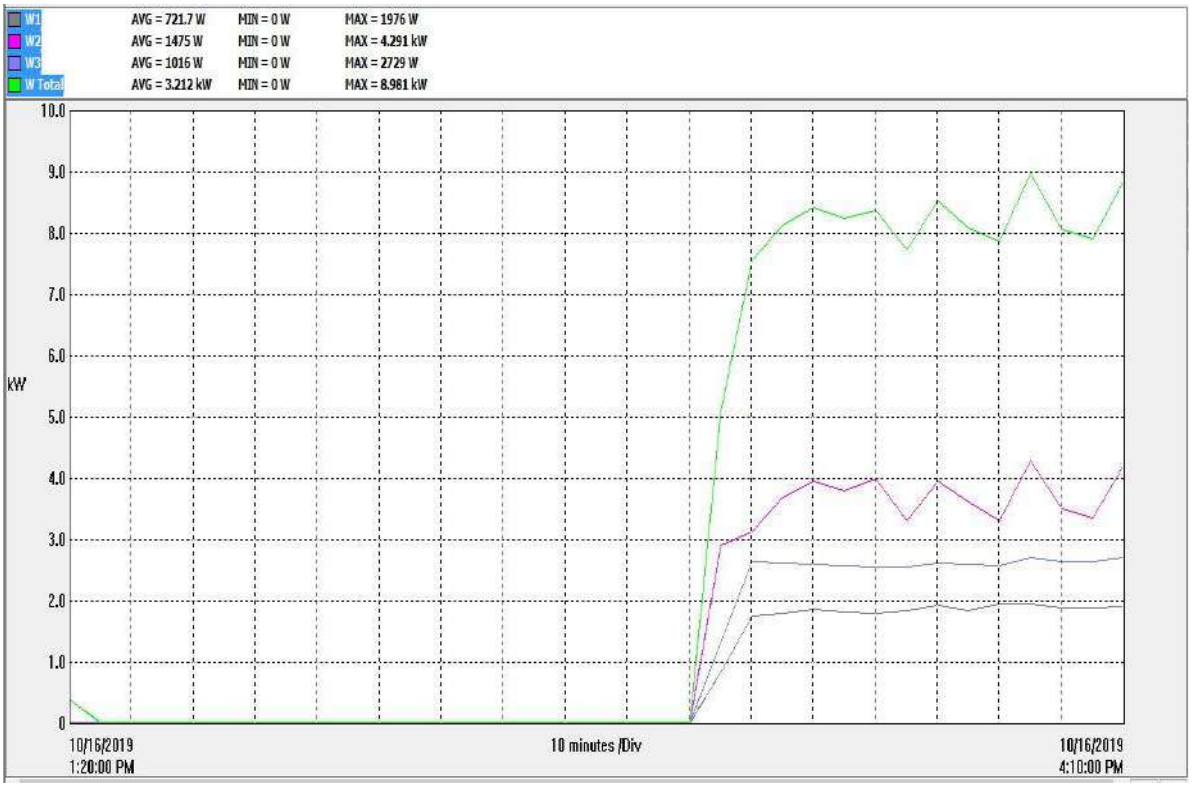

Fig.152 Shows the power (kW) for 3.10 hours from 16/10/2019 1.20PM to 16/10/2019 4.10PM

Inference: Power distribution is not balanced. Phase 1 is found to be unbalance. It is loaded only 23% of the total.

AUTONOMOUS BLOCK

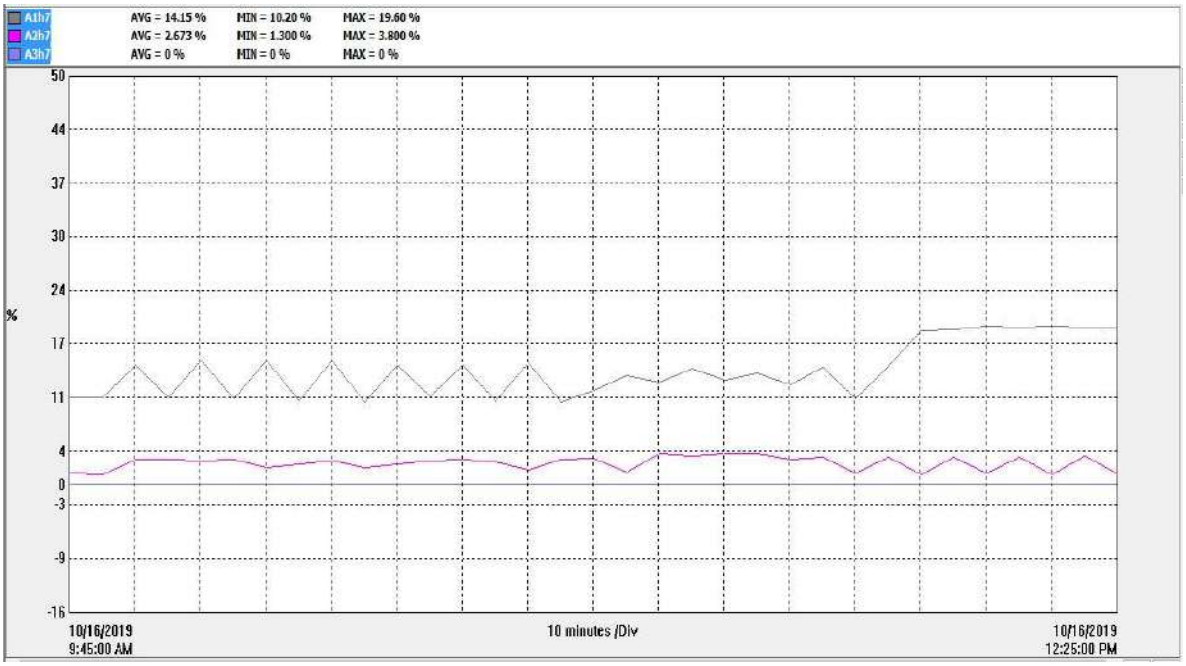

Fig 153. Shows the 7th order THD (Voltage Harmonic) for 1.40 HOURS from 16/10/2019 9.45PM to 16/10/2019 8.55PM

Inference: Harmonics seems to be normal. No need of harmonic filters.

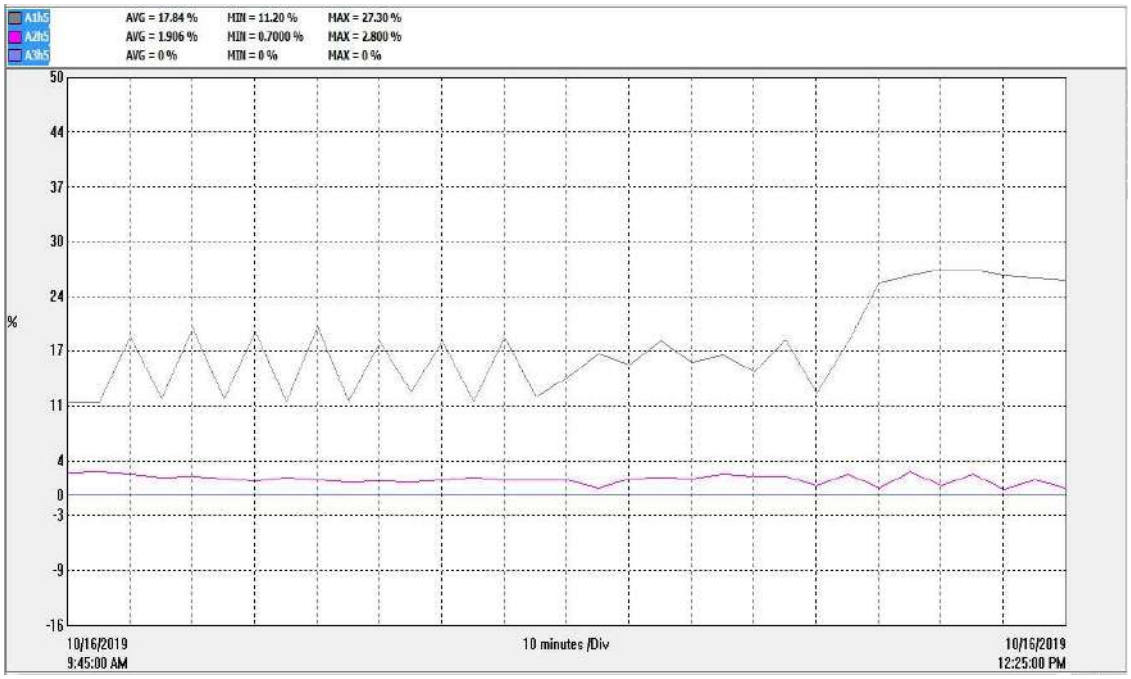

Fig 154. Shows the 5th order THD (Voltage Harmonic) for 1.40 HOURS from 16/10/2019 9.45PM to 16/10/2019 8.55PM

Inference: Harmonics seems to be normal. No need of harmonic filters.

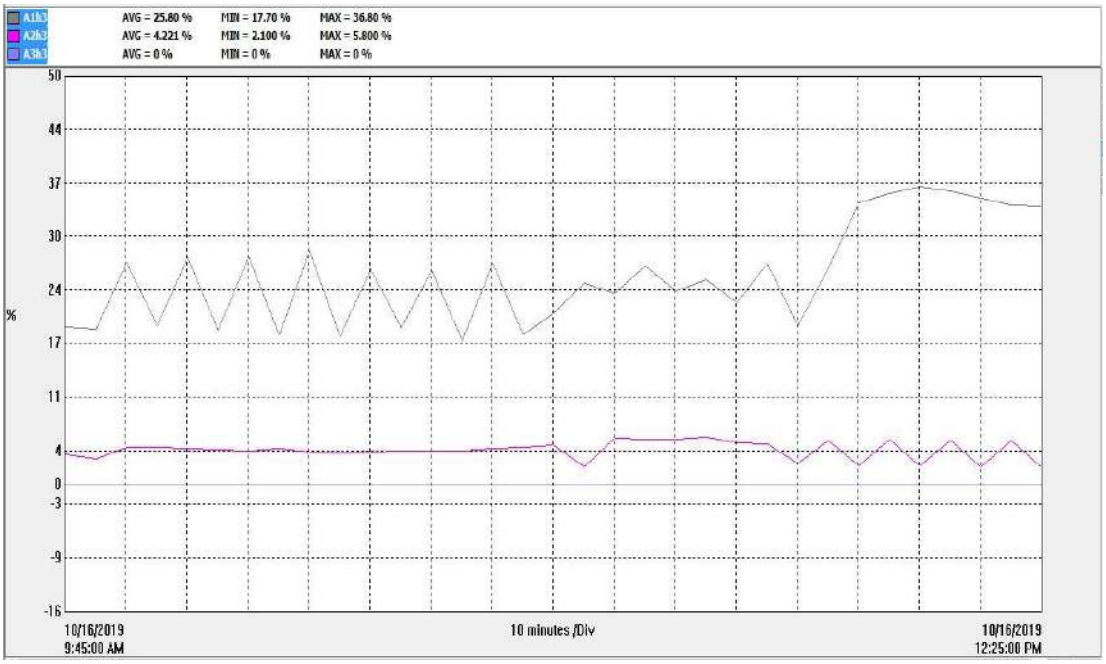

Fig 155 Shows the 3rd THD (Voltage Harmonic) for 1.40 HOURS from 16/10/2019 9.45PM to 16/10/2019 8.55PM

Inference: As THD is high, it is recommended to have harmonic filter as preventive measure against equipment failures.

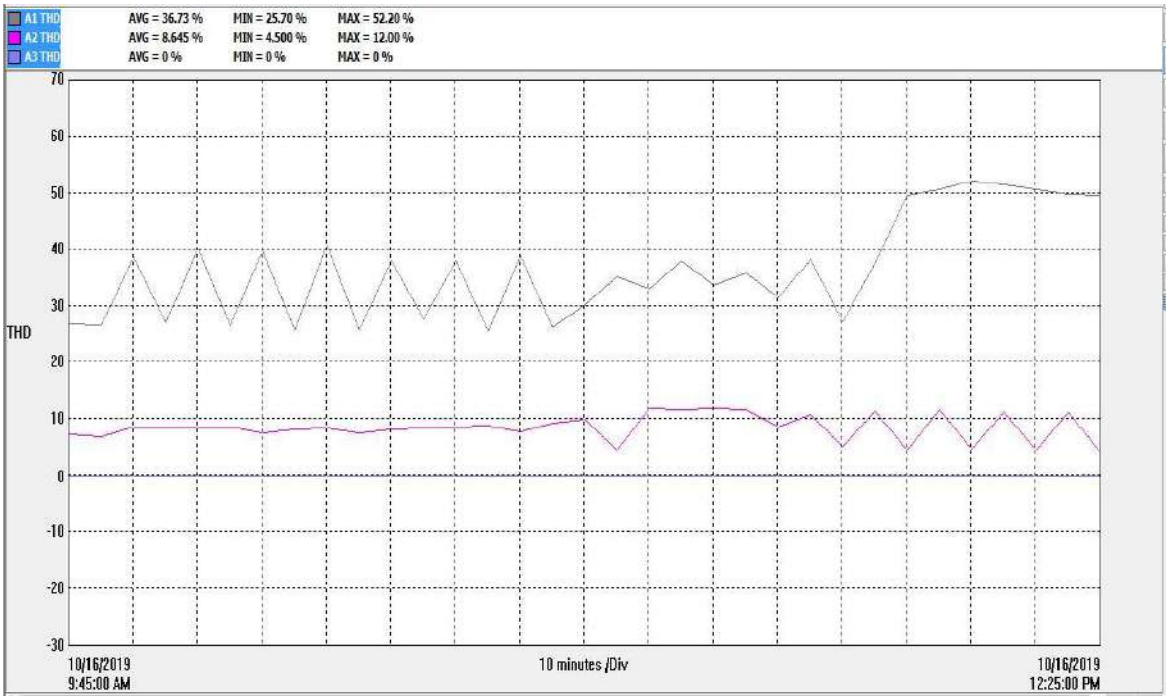

Fig 156. Shows the THD (Voltage Harmonic) for 1.40 HOURS from 16/10/2019 9.45PM to 16/10/2019 8.55PM

Inference: As THD is high, it is recommended to have harmonic filter as preventive measure against equipment failures.

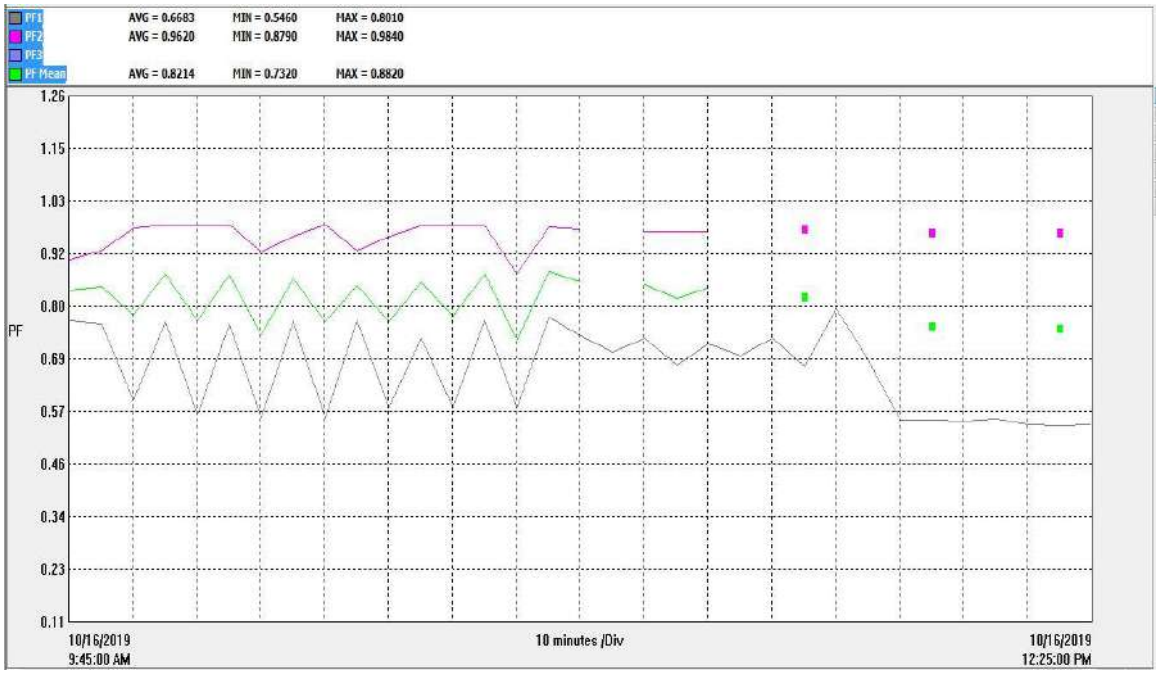

Fig157.Shows the power factor (PF) for 1.40 HOURS from 16/10/2019 9.45PM to 16/10/2019 8.55PM

Inference: No unbalanced found here. Need to be improve the PF.

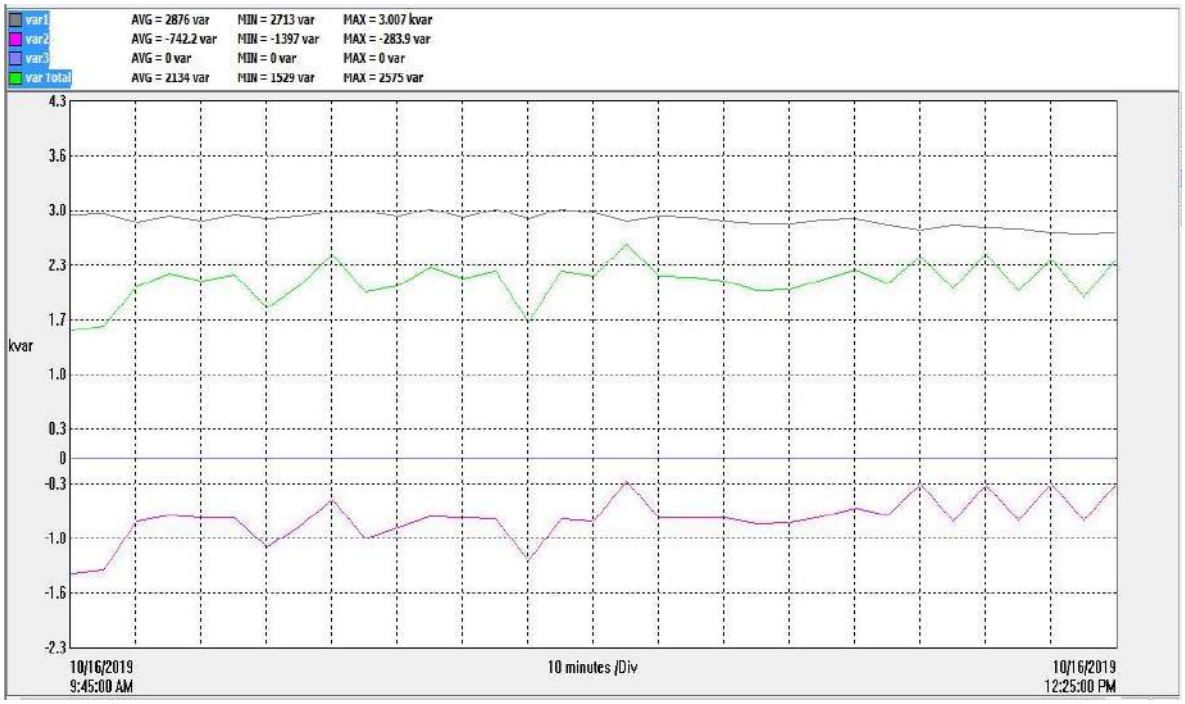

Fig158. Shows the reactive power (kVAR) for 1.40 HOURS from 16/10/2019 9.45PM to 16/10/2019 8.55PM

Inference: Phase 2 shows very low KVAR compare to other two phases.

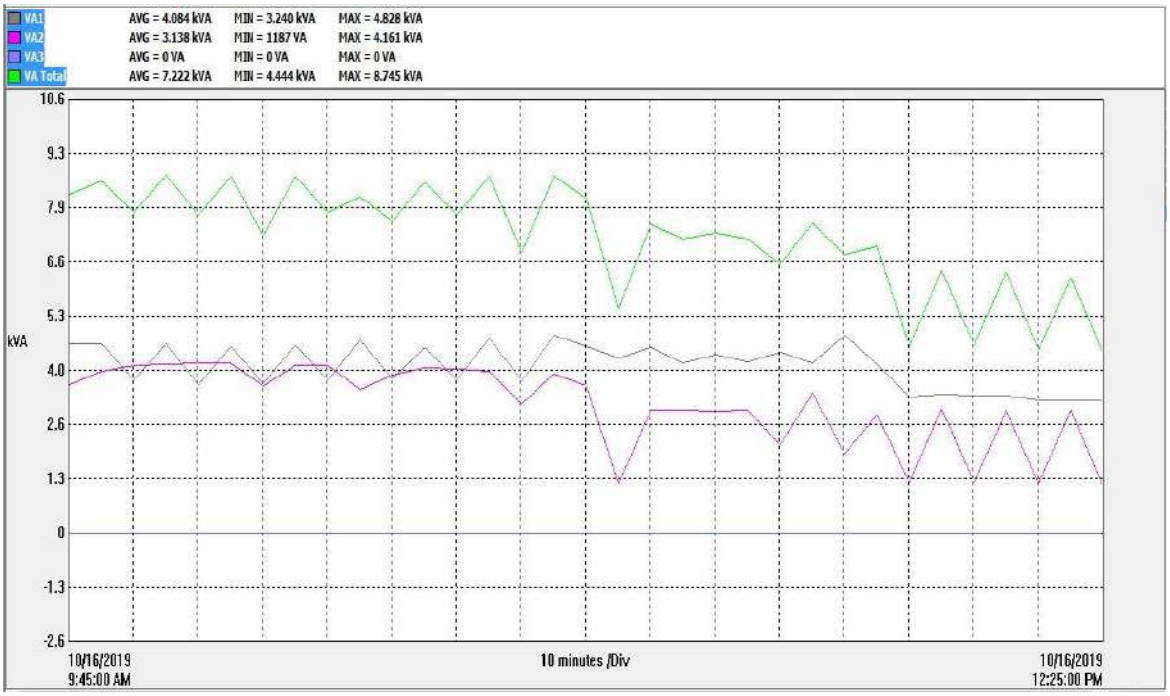

Fig159. Shows the power (kVA) for 1.40 HOURS from 16/10/2019 9.45PM to 16/10/2019 8.55PM
Inference: Phase 3 shows very low KVA.

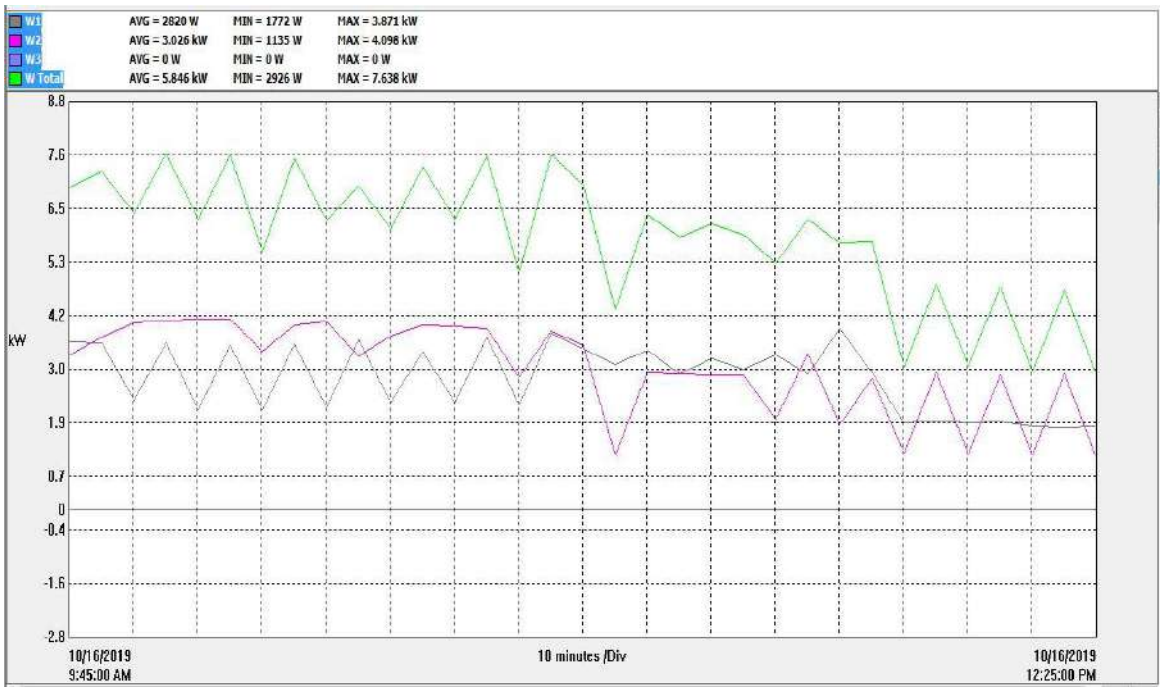

Fig 160. Shows the power (kW) for 1.40 HOURS from 16/10/2019 9.45PM to 16/10/2019 8.55PM
Inference: power distribution is not balanced. Phase 3 is found to be unbalanced .

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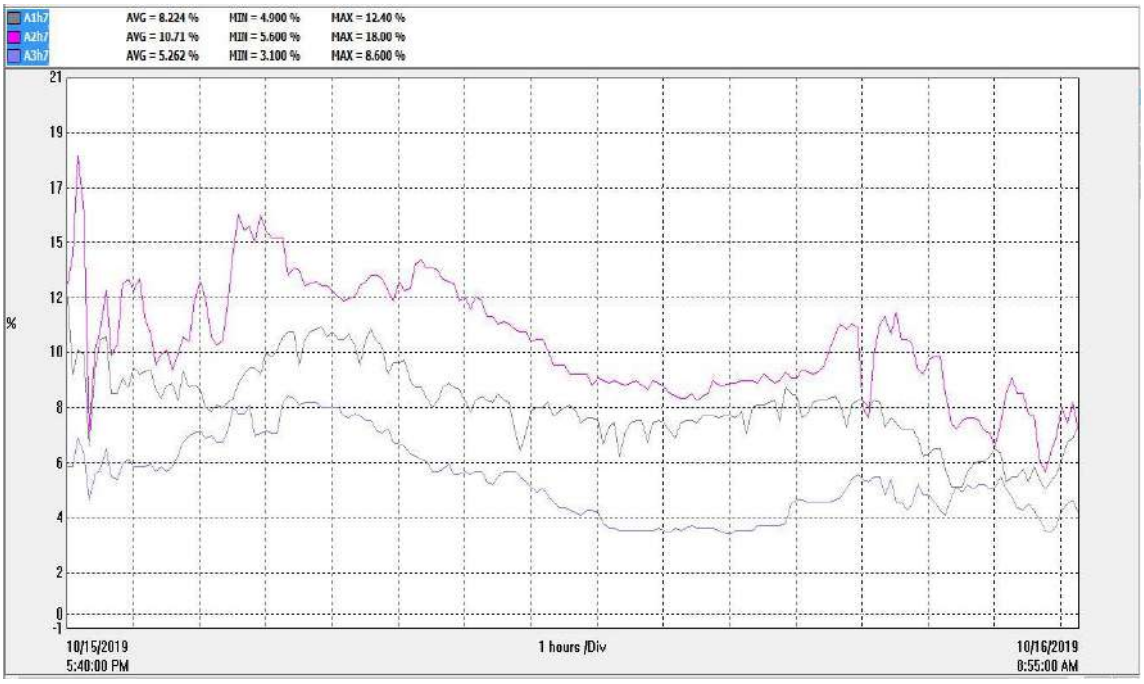

Fig 161. Shows the 7th order THD (Voltage Harmonic) for 3 HOURS from 15/10/2019 5.40PM to 15/10/2019 8.55PM

Inference: Harmonics seems to be normal. No need of harmonic filters.

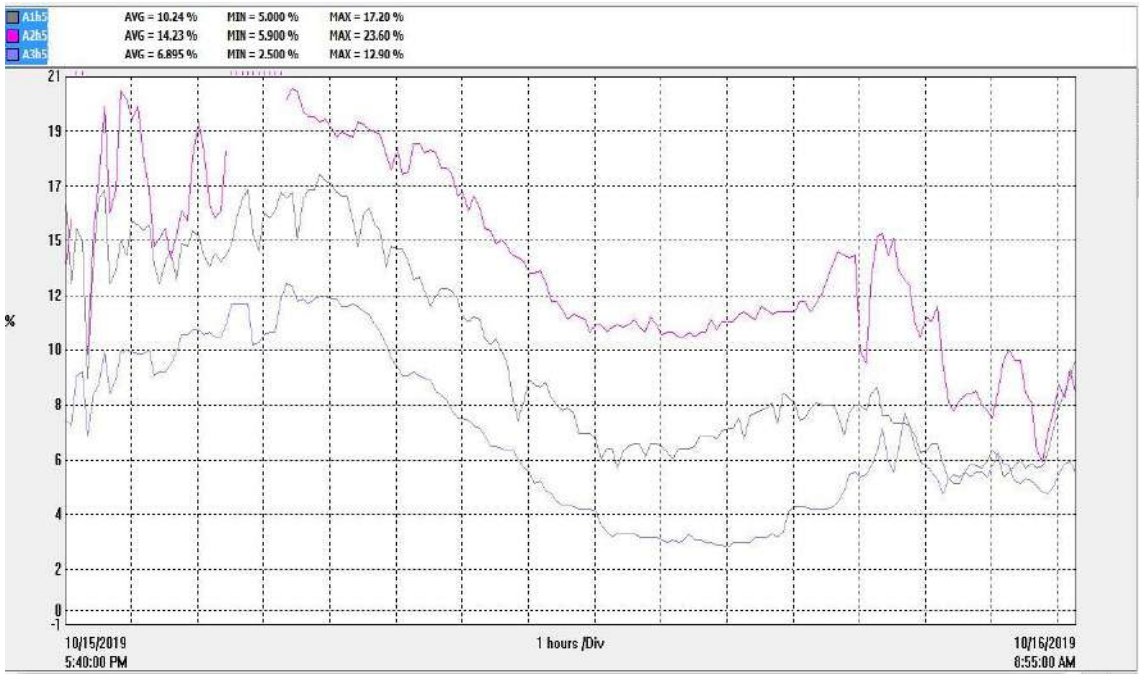

Fig 162. Shows the 5th order THD (Voltage Harmonic) for 3 HOURS from 15/10/2019 5.40PM to 15/10/2019 8.55PM

Inference: Harmonics seems to be normal. No need of harmonic filters.

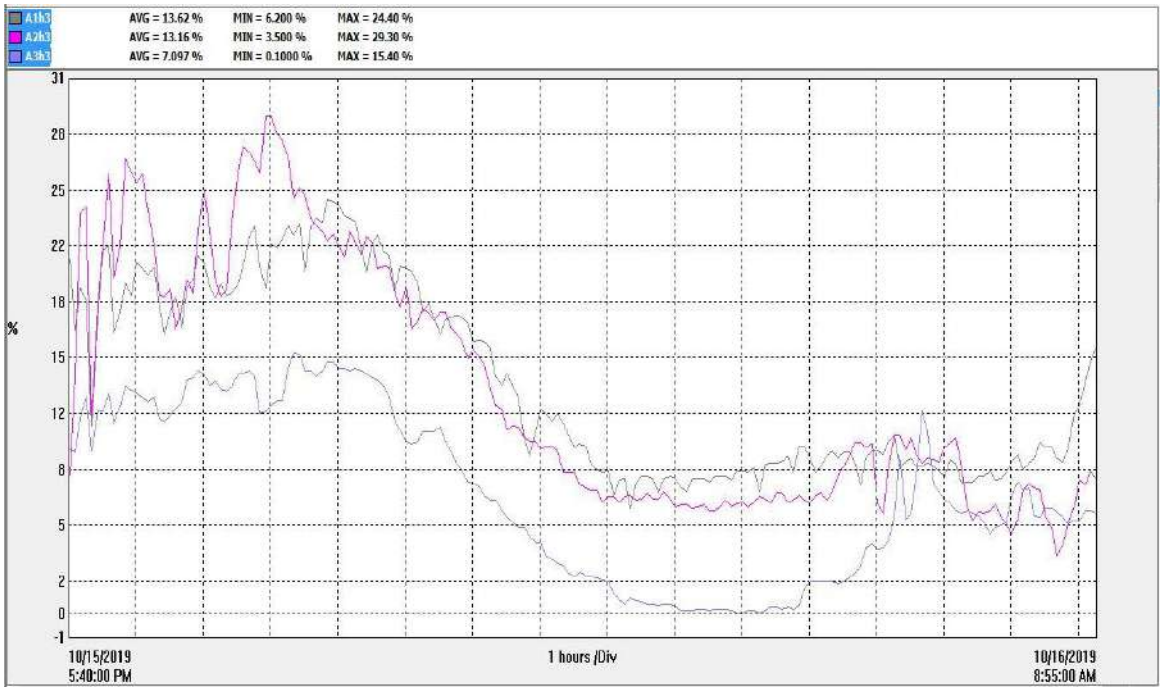

Fig 163. Shows the 3rd THD (Voltage Harmonic) for 3 HOURS from 15/10/2019 5.40PM to 15/10/2019 8.55PM

Inference: Harmonics seems to be normal. No need of harmonic filters.

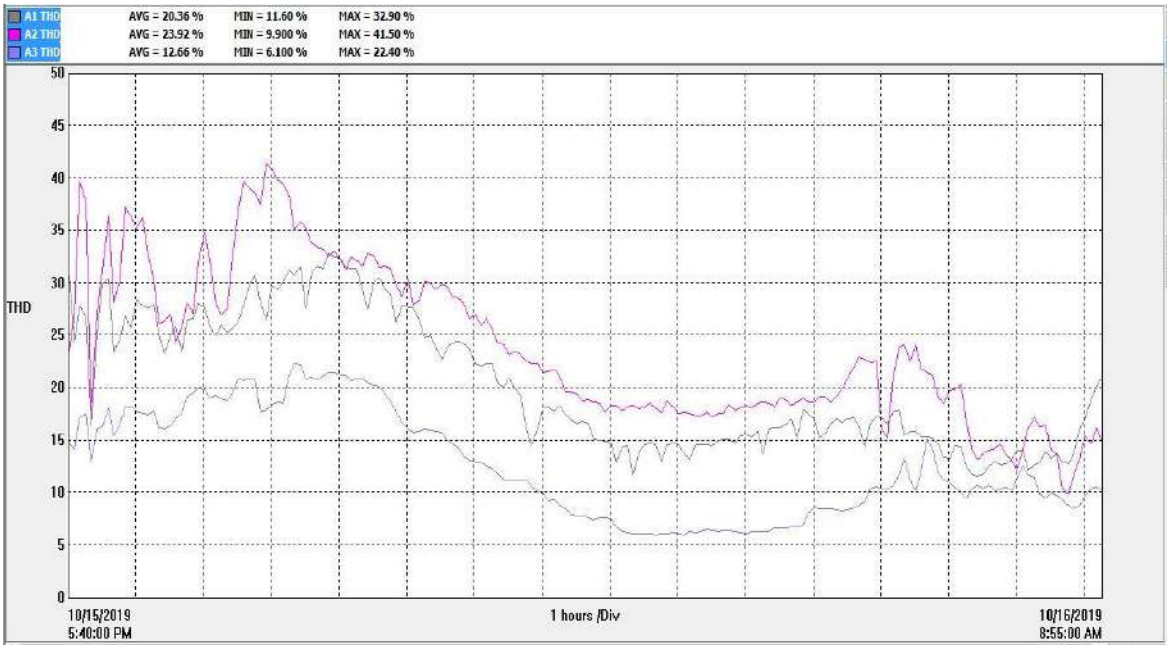

Fig 164. Shows the THD (Voltage Harmonic) for 3 HOURS from 15/10/2019 5.40PM to 15/10/2019 8.55PM

Inference: As THD is high, it is recommended to have harmonic filter as preventive measure against equipment failures.

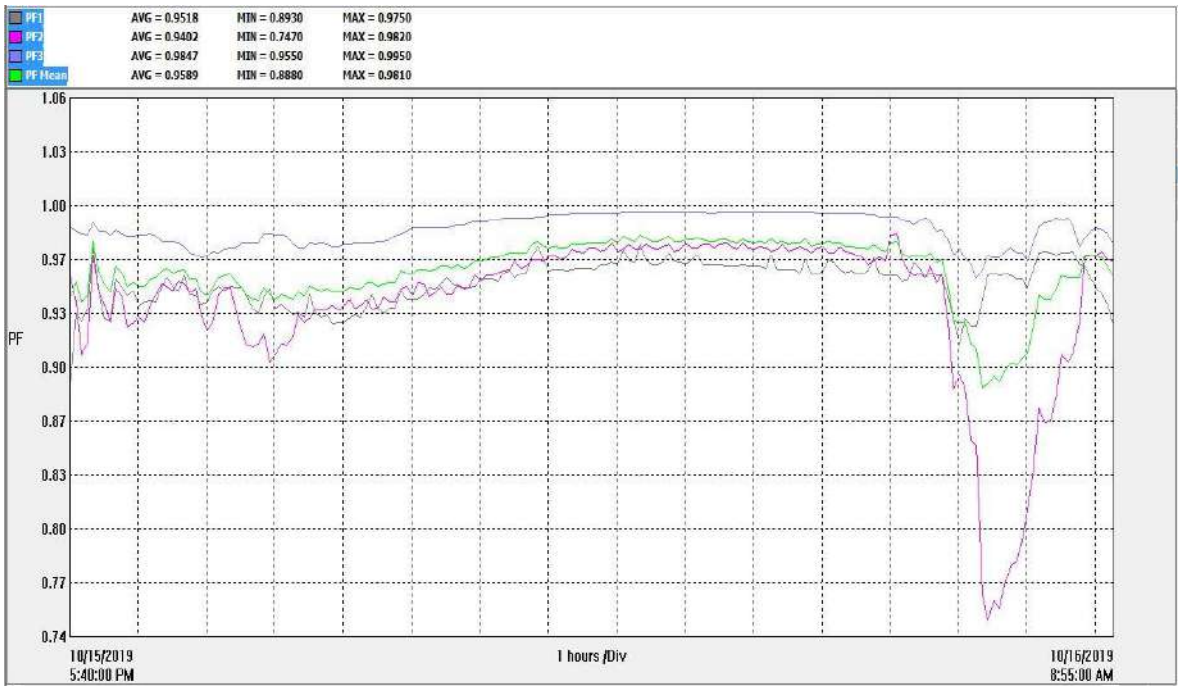

Fig 165.Shows the power factor (PF) for 3 HOURS from 15/10/2019 5.40PM to 15/10/2019 8.55PM
Inference: No unbalanced found here.

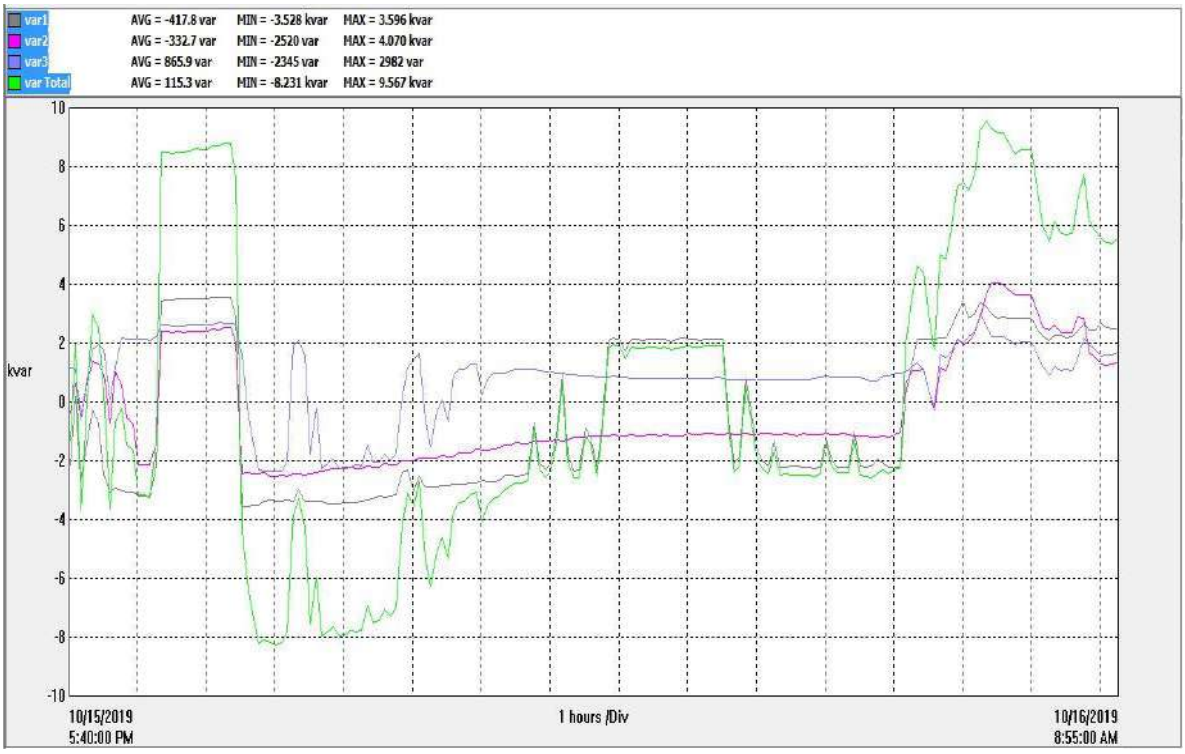

Fig 166. Shows the reactive power (kVAR) for 3 HOURS from 15/10/2019 5.40PM to 15/10/2019 8.55PM
Inference: Phase 1 shows very low KVAR compare to other two phases.

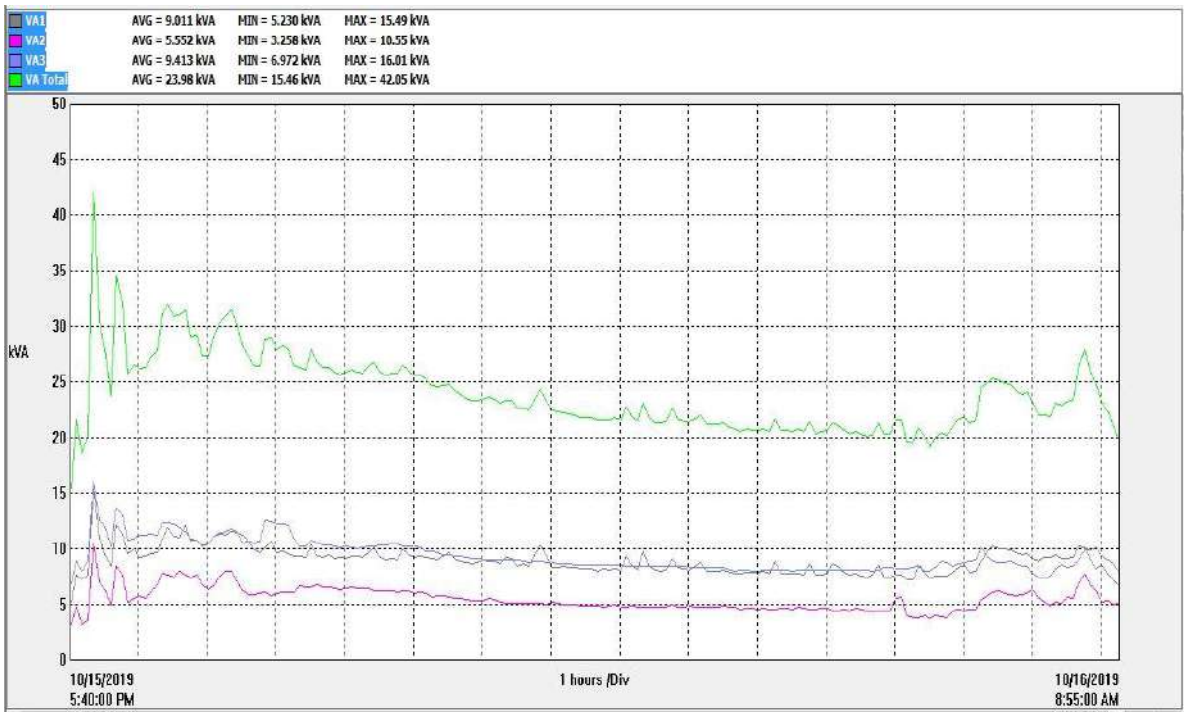

Fig 167. Shows the power (kVA) for 3 HOURS from 15/10/2019 5.40PM to 15/10/2019 8.55PM
Inference: Phase 2 shows very low KVA.

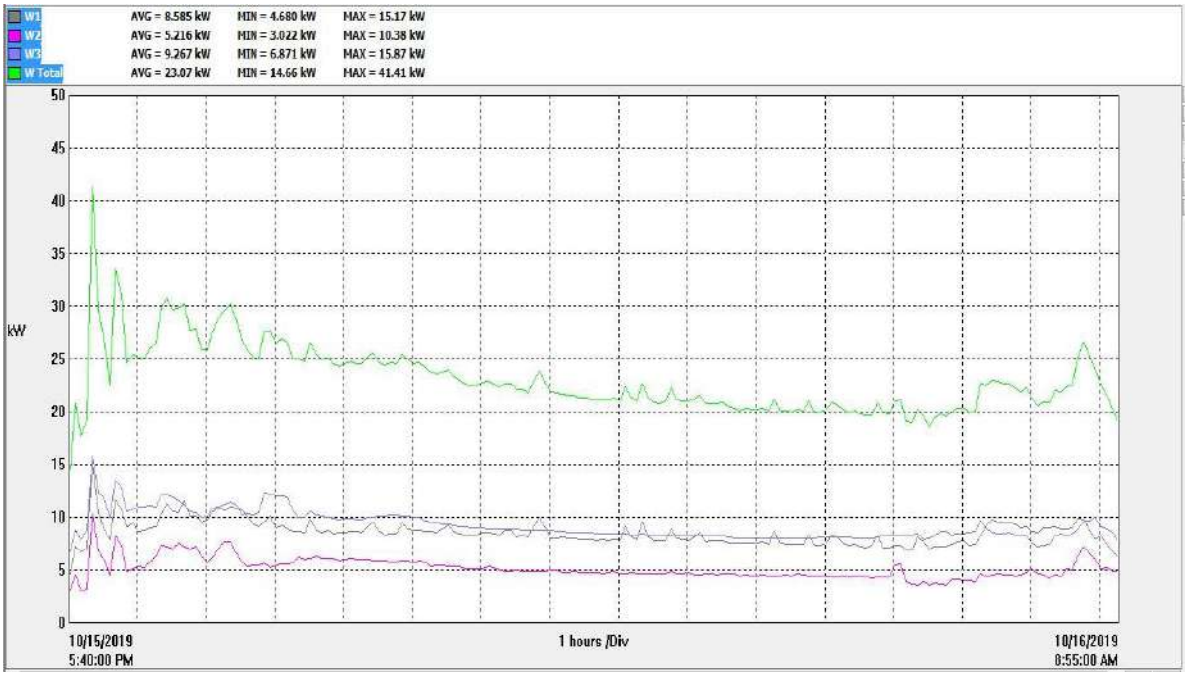

Fig 168. Shows the power (kW) for 3 HOURS from 15/10/2019 5.40PM to 15/10/2019 8.55PM

Inference: power distribution is not balanced. Phase 2 is found to be unbalanced and it loaded only 23% of the total.

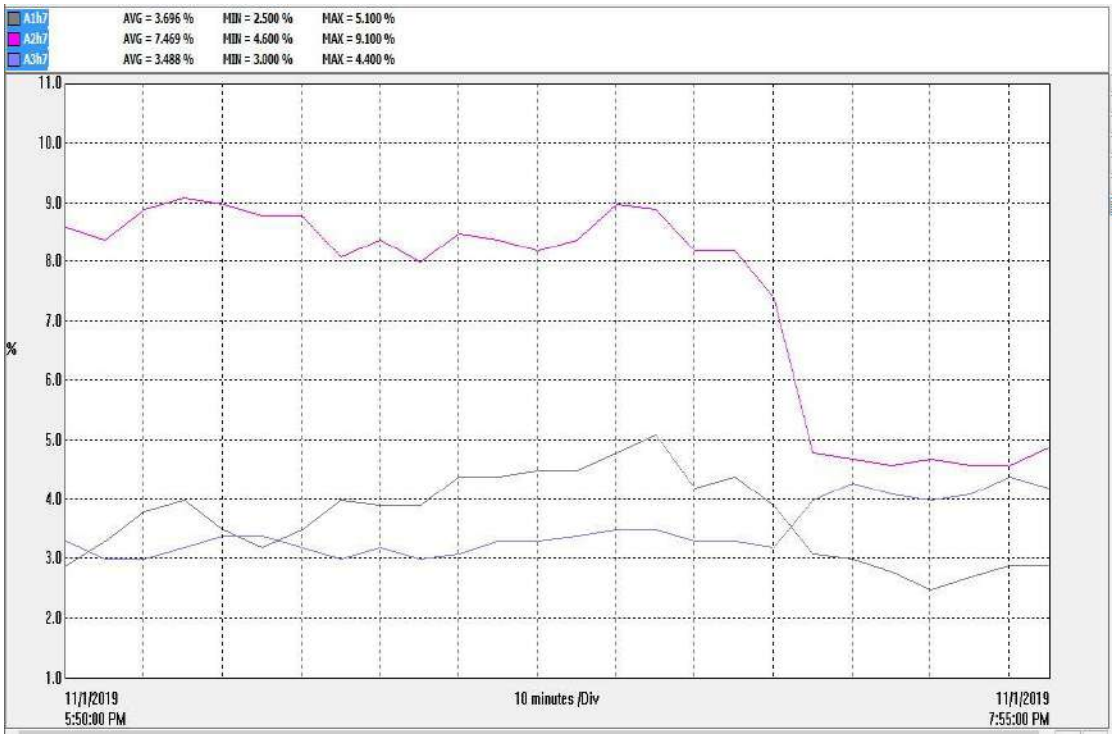

Fig 169. Shows the 7th order THD (Voltage Harmonic) 2 HOURS from 11/11/2019 5.50PM to 11/11/2019 7.55PM

Inference: Harmonics seems to be normal. No need of harmonic filters.

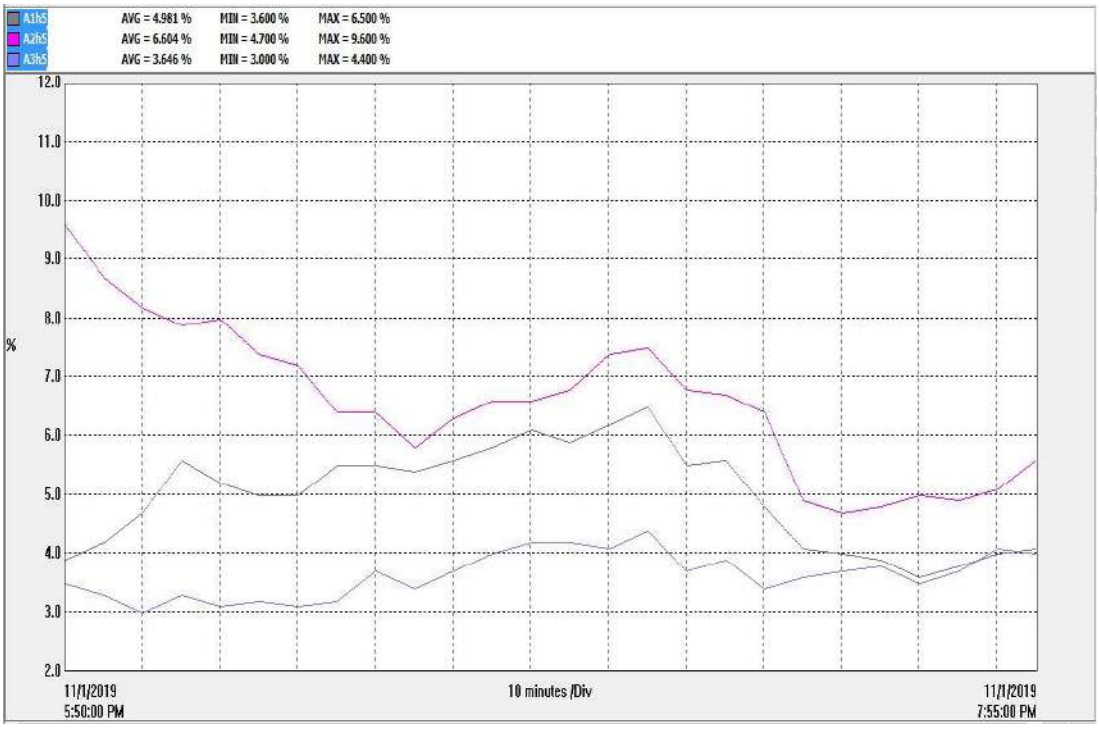

Fig 170. Shows the 5th order THD (Voltage Harmonic) 2 HOURS from 11/11/2019 5.50PM to 11/11/2019 7.55PM

Inference: Harmonics seems to be normal. No need of harmonic filters.

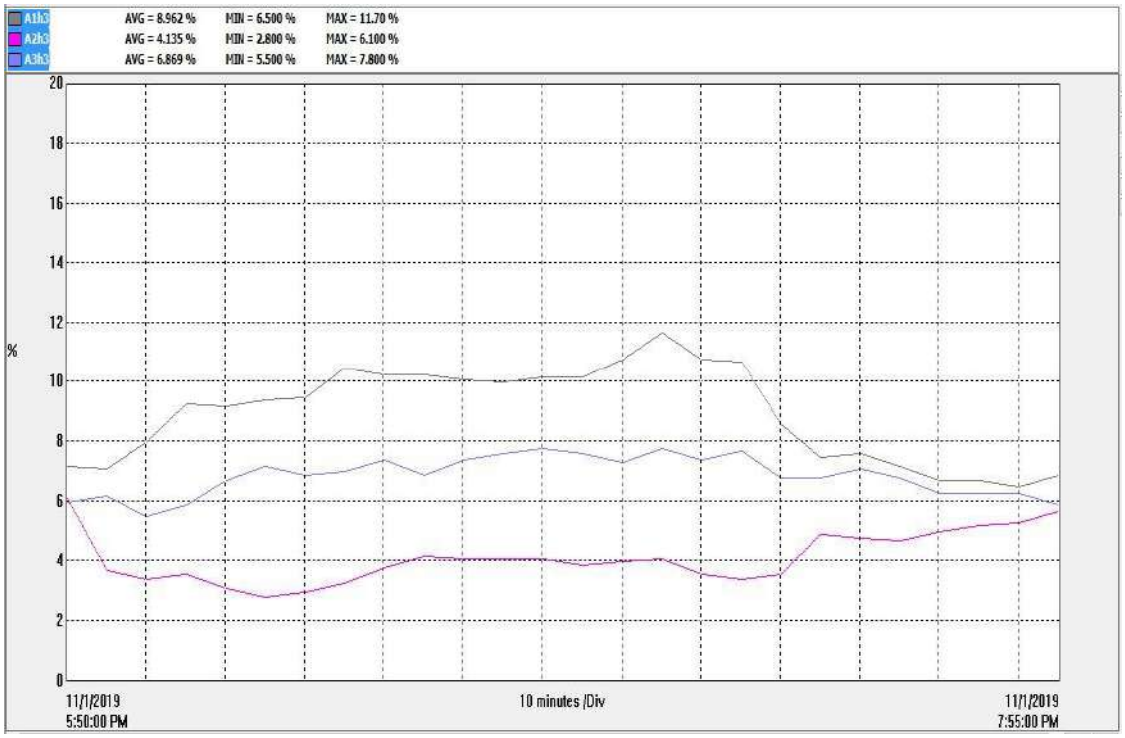

Fig171. Shows the 3rd THD (Voltage Harmonic) 2 HOURS from 11/11/2019 5.50PM to 11/11/2019 7.55PM

Inference: Harmonics seems to be normal. No need of harmonic filters.

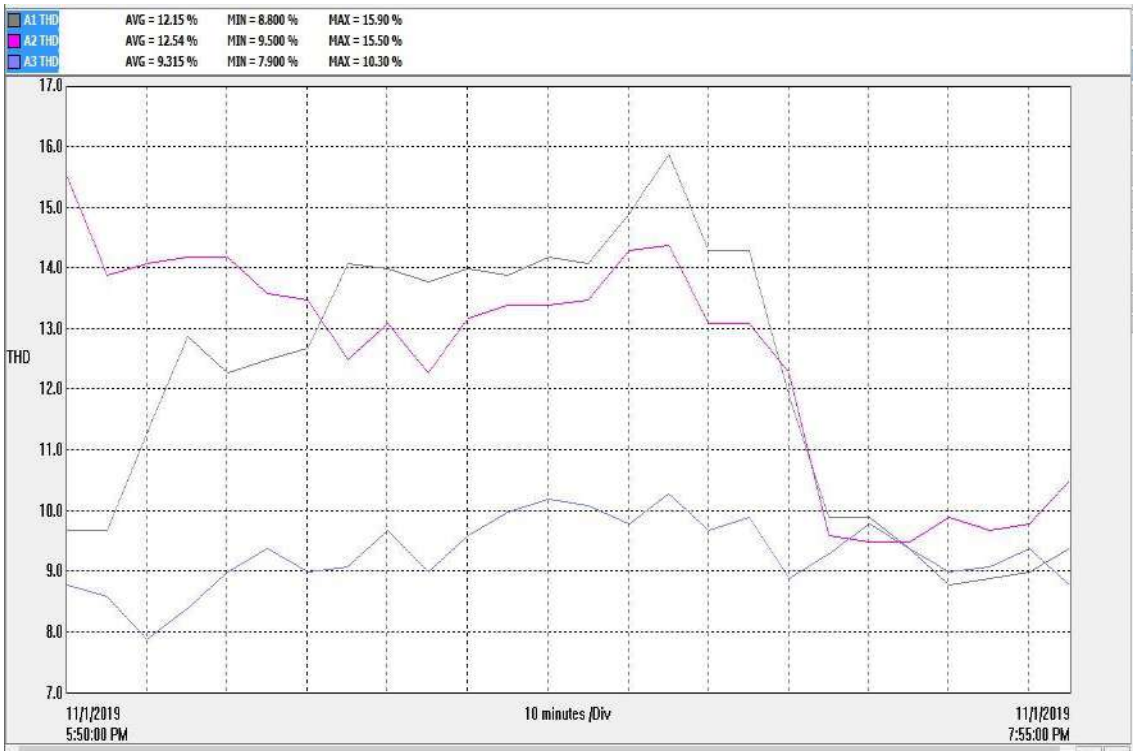

Fig 172. Shows the THD (Voltage Harmonic) 2 HOURS from 11/11/2019 5.50PM to 11/11/2019 7.55PM

Inference: Harmonics seems to be normal. No need of harmonic filters.

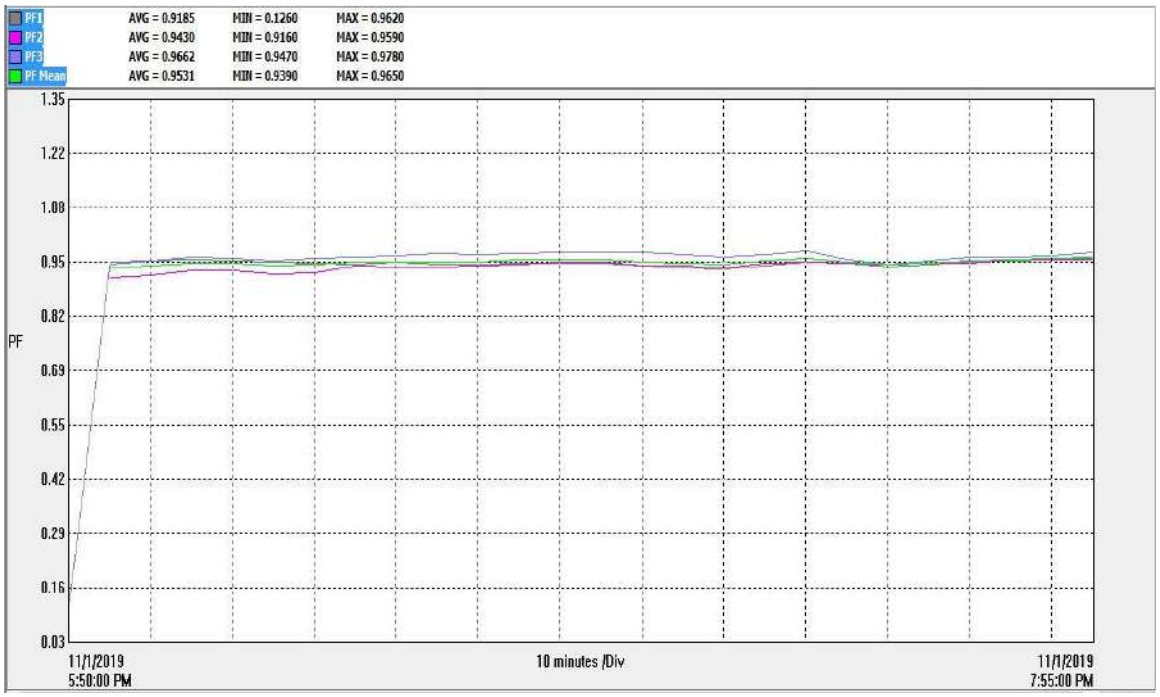

Fig 173. Shows the power factor (PF) 2 HOURS from 11/11/2019 5.50PM to 11/11/2019 7.55PM
Inference: Balanced found here. Need to be improve the PF.

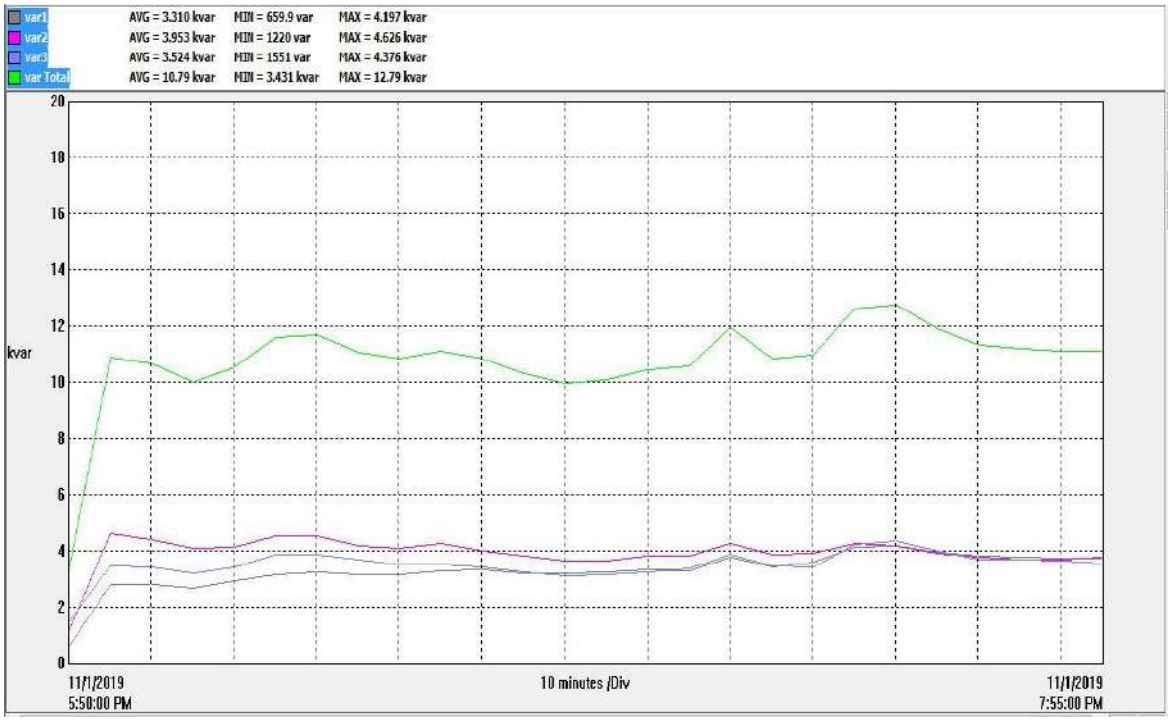

Fig 174. Shows the reactive power (kVAR) 2 HOURS from 11/11/2019 5.50PM to 11/11/2019 7.55PM
Inference: Balanced found here, KVR seems to be normal.

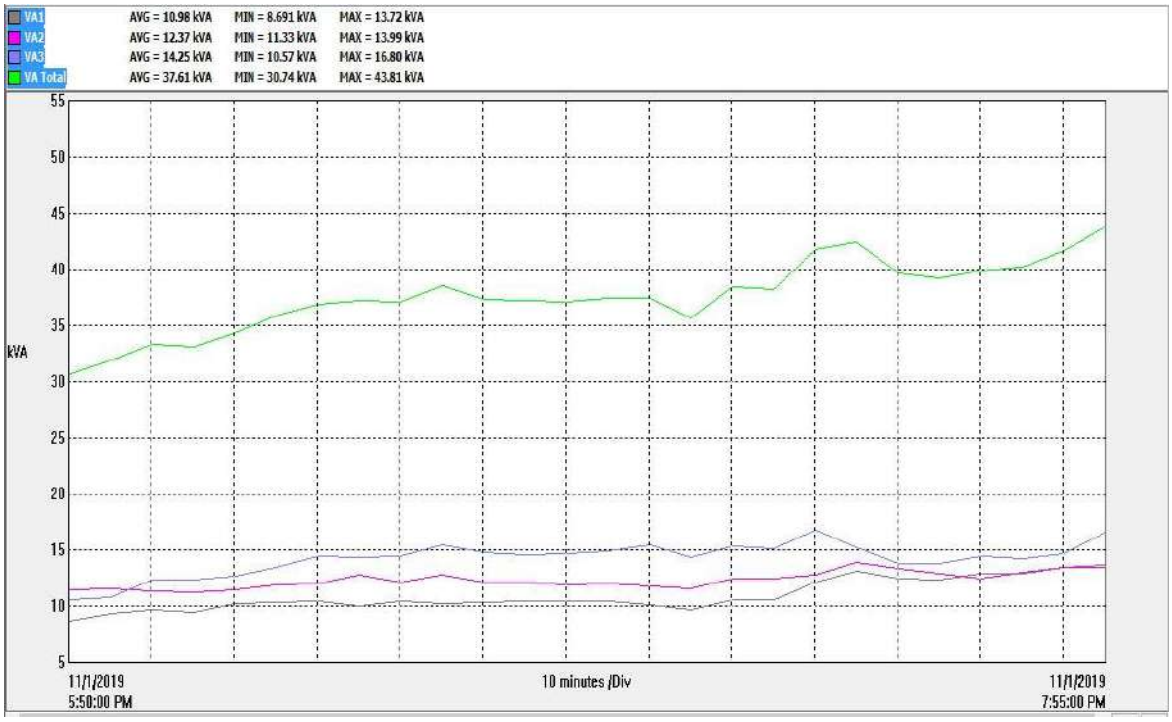

fig 175. Shows the power (kVA) for 2 HOURS from 11/11/2019 5.50PM to 11/11/2019 7.55PM

Inference: Balanced found here, KVA seems to be normal.

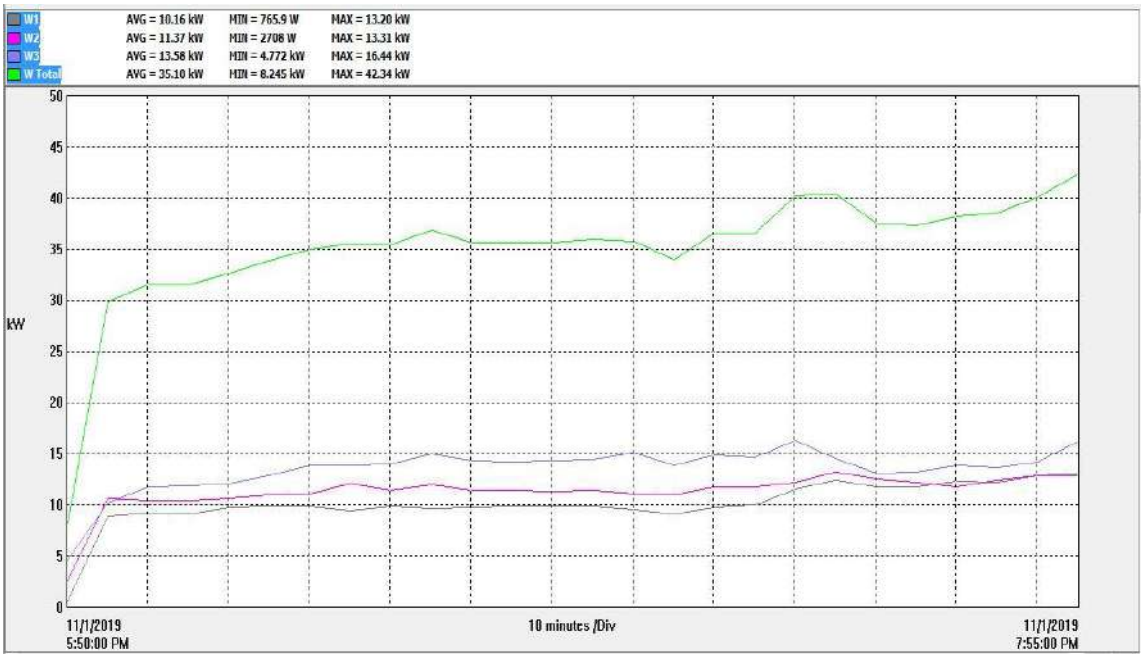

Fig 176. Shows the power (kW) for 2 HOURS from 11/11/2019 5.50PM to 11/11/2019 7.55PM
Inference: power distribution is balance.

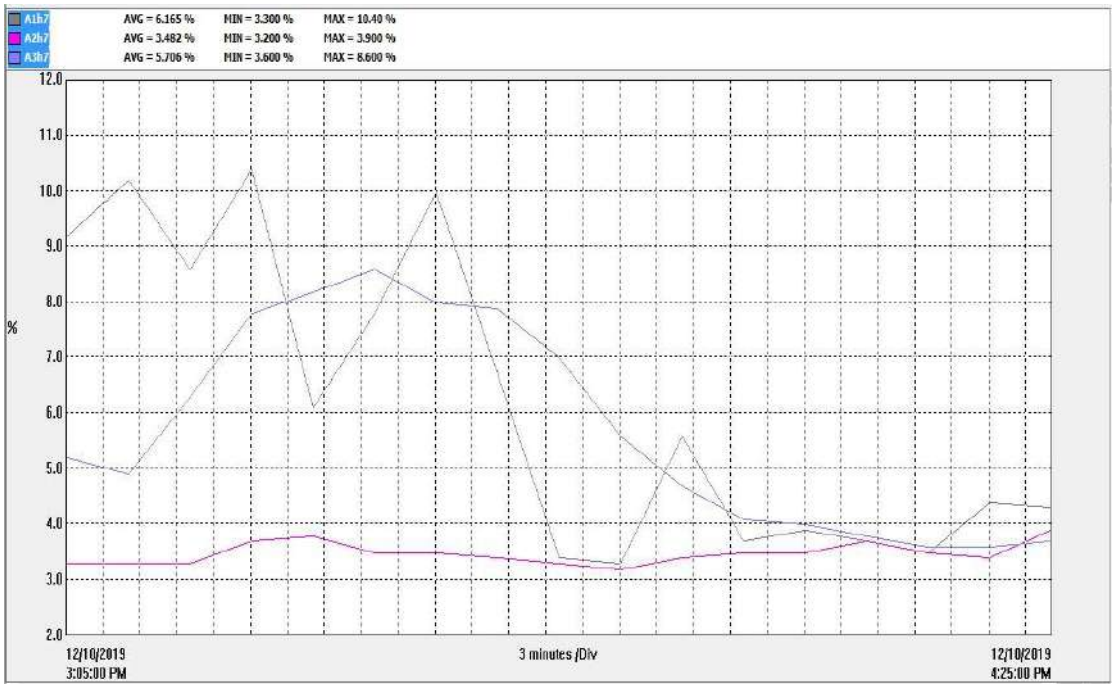

Fig 177. Shows the 7th order THD (Voltage Harmonic) for 20MINUTES from 10/12/2019 12.55PM to 10/12/2019 4.25PM

Inference: Harmonics seems to be normal. No need of harmonic filters.

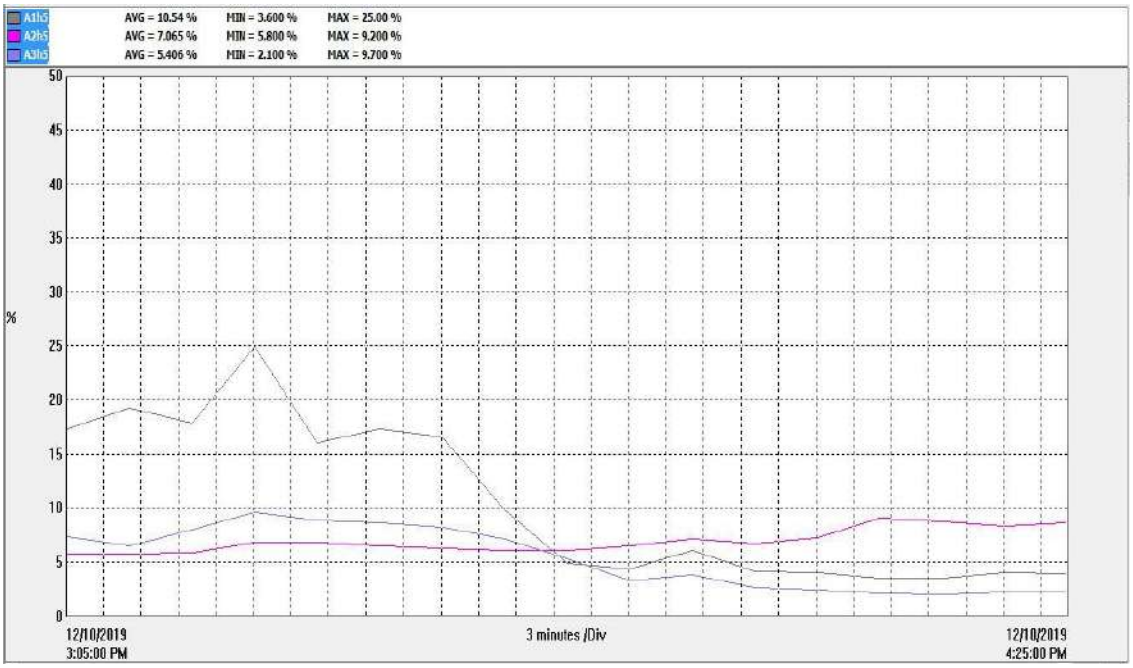

Fig 178. Shows the 5th order THD (Voltage Harmonic) for 20MINUTES from 10/12/2019 12.55PM to 10/12/2019 4.25PM

Inference: Harmonics seems to be normal. No need of harmonic filters.

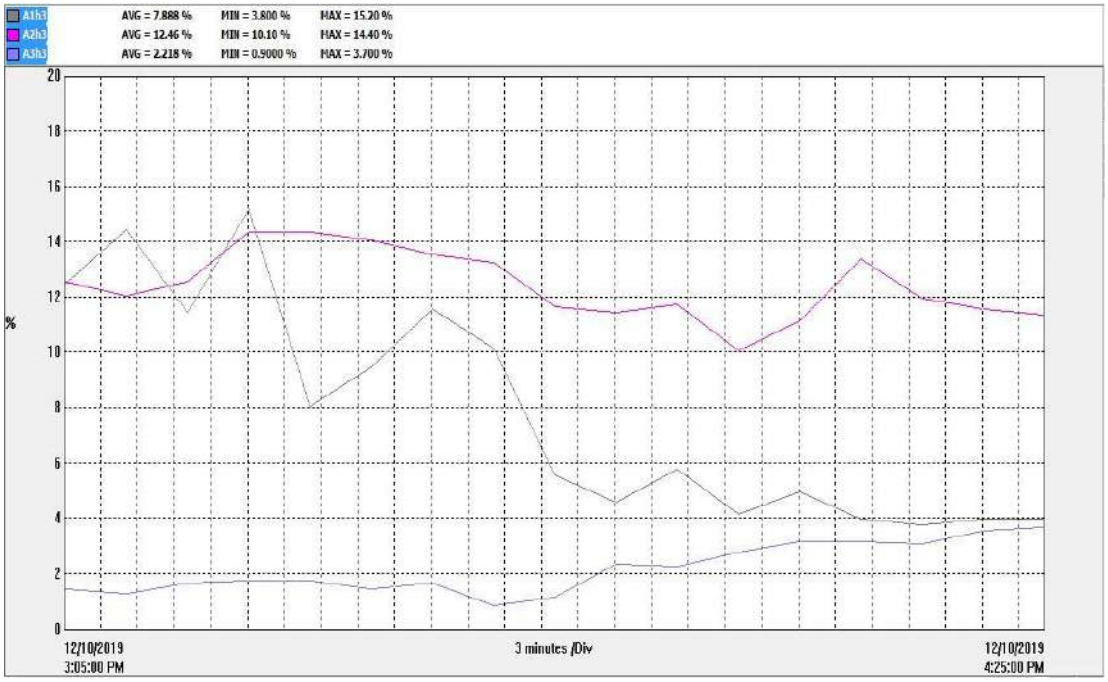

Fig 179. Shows the 3rd THD (Voltage Harmonic) for 20MINUTES from 10/12/2019 12.55PM to 10/12/2019 4.25PM

Inference: Harmonics seems to be normal. No need of harmonic filters.

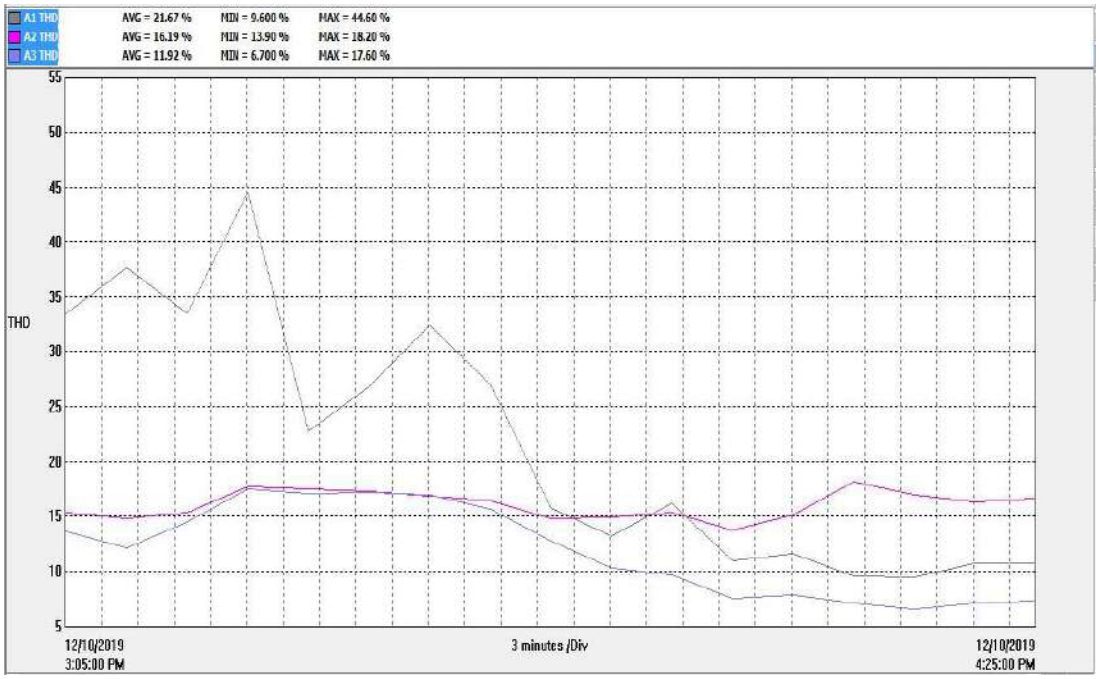

Fig 180. Shows the THD (Voltage Harmonic) for 20MINUTES from 10/12/2019 12.55PM to 10/12/2019 4.25PM

Inference: As THD is high, it is recommended to have harmonic filter as preventive measure against equipment failures.

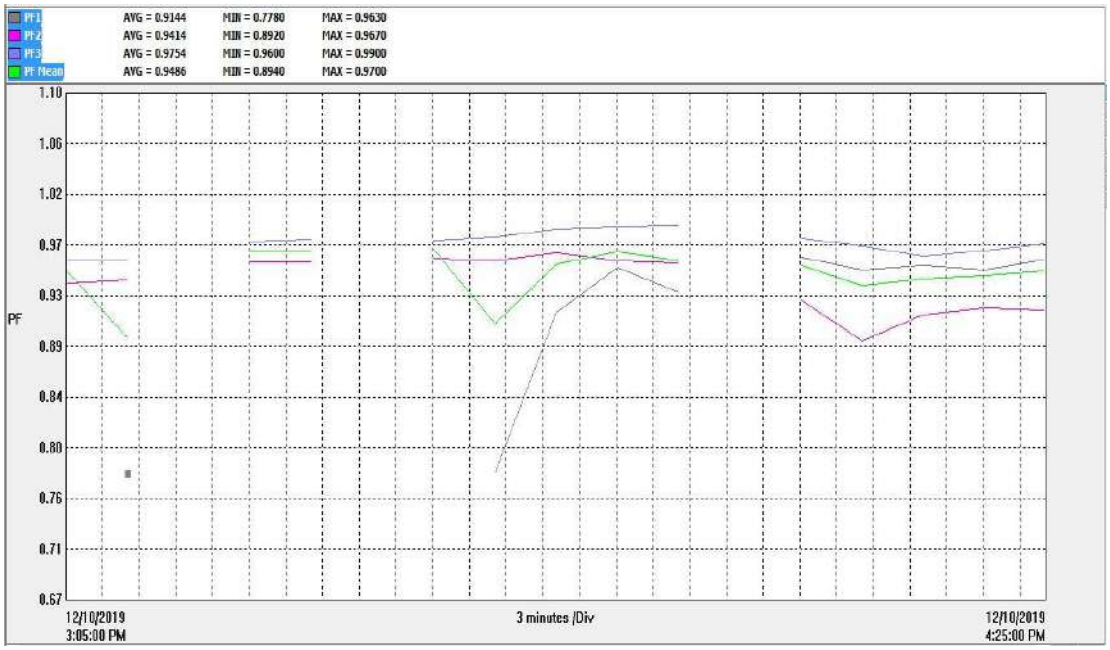

Fig 181. Shows the power factor (PF) for 20MINUTES from 10/12/2019 12.55PM to 10/12/2019 4.25PM

Inference: No unbalanced found here. Need to be improve the PF.

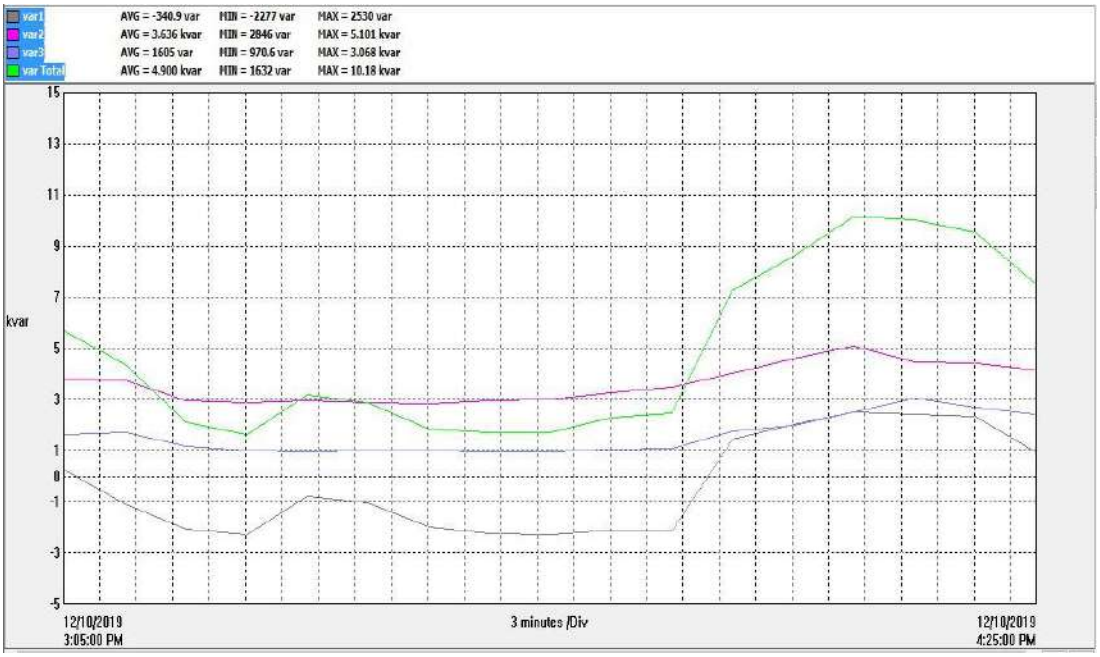

Fig 182. Shows the reactive power (kVAR) for 20MINUTES from 10/12/2019 12.55PM to 10/12/2019 4.25PM

Inference: Phase 1 shows very low KVAR compare to other two phases.

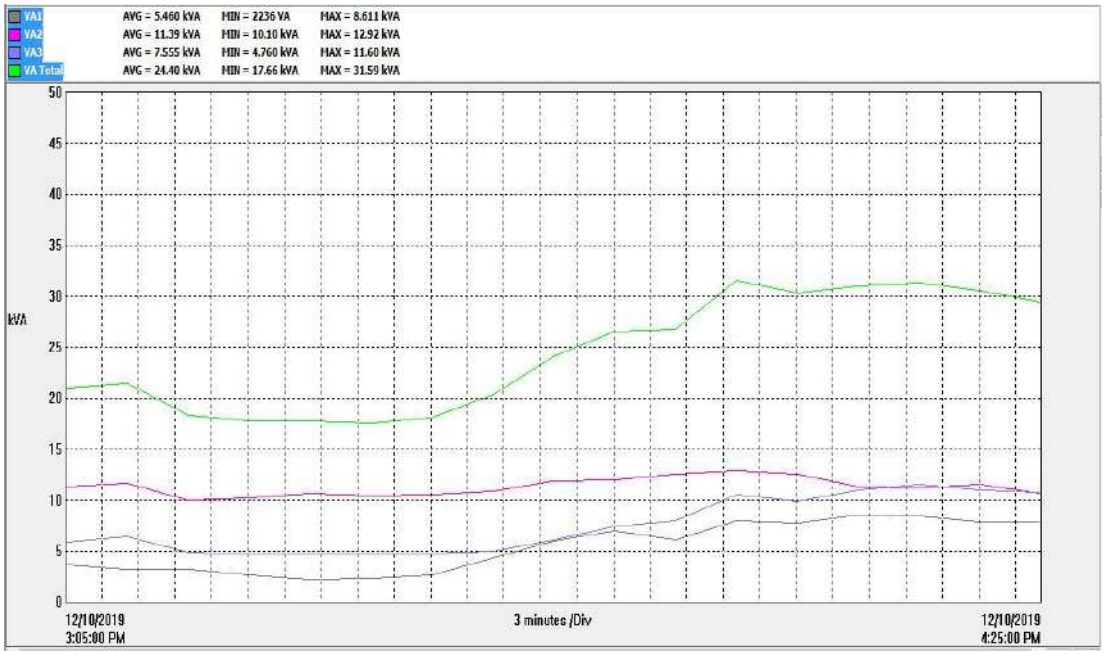

Fig 183. Shows the power (kVA) for 20MINUTES from 10/12/2019 12.55PM to 10/12/2019 4.25PM
Inference: Phase 1 shows very low KVA.

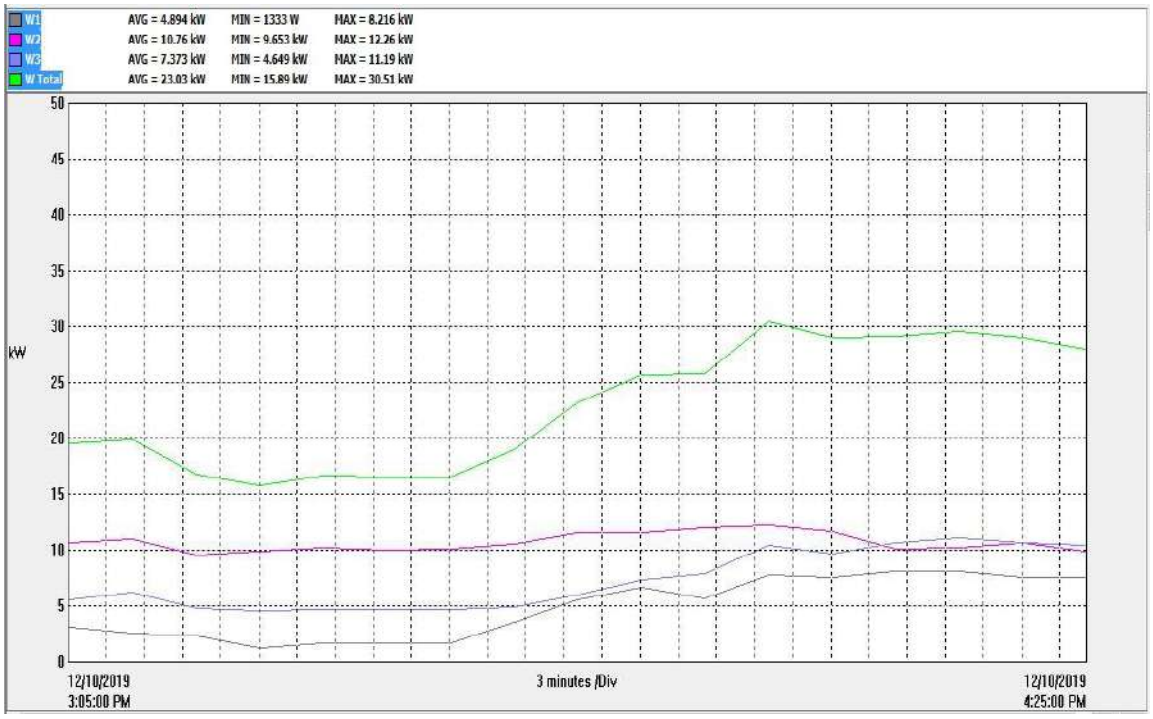

Fig 184. Shows the power (kW) for 20MINUTES from 10/12/2019 12.55PM to 10/12/2019 4.25PM
Inference: power distribution is not balanced. Phase 1 is found to be unbalanced and it loaded only 22% of the total.

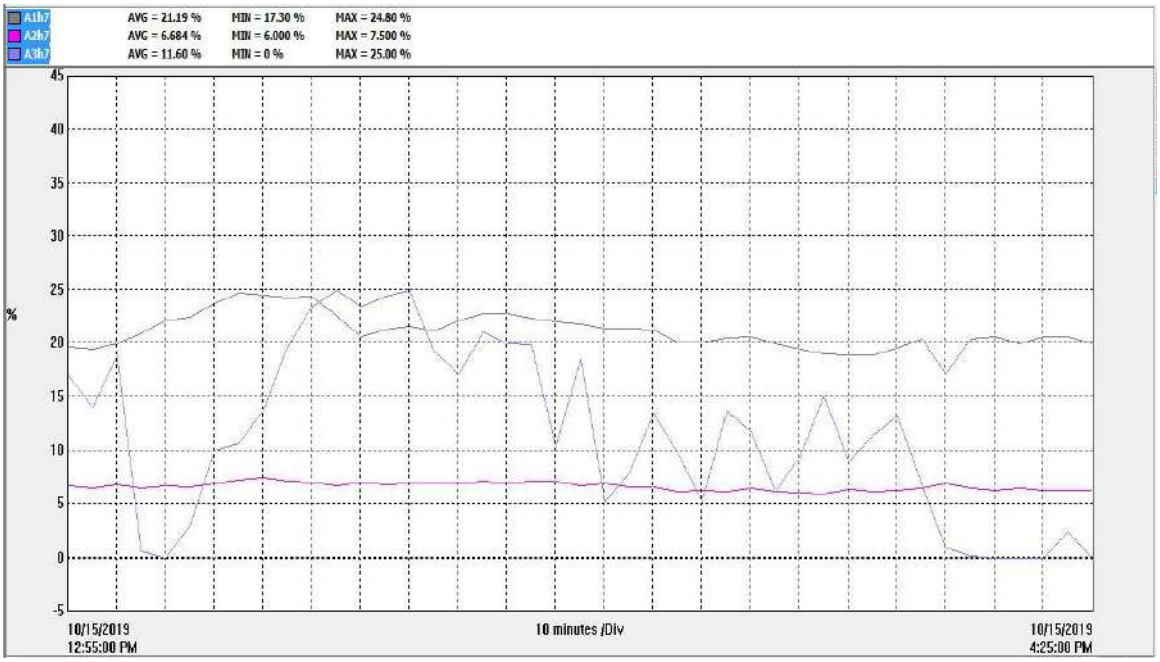

Fig 185. Shows the 7th order THD (Voltage Harmonic) for 4.20hours from 15/10/2019 12.55PM to 15/10/2019 4.25PM

Inference: As THD is high, it is recommended to have harmonic filter as preventive measure against equipment failures.

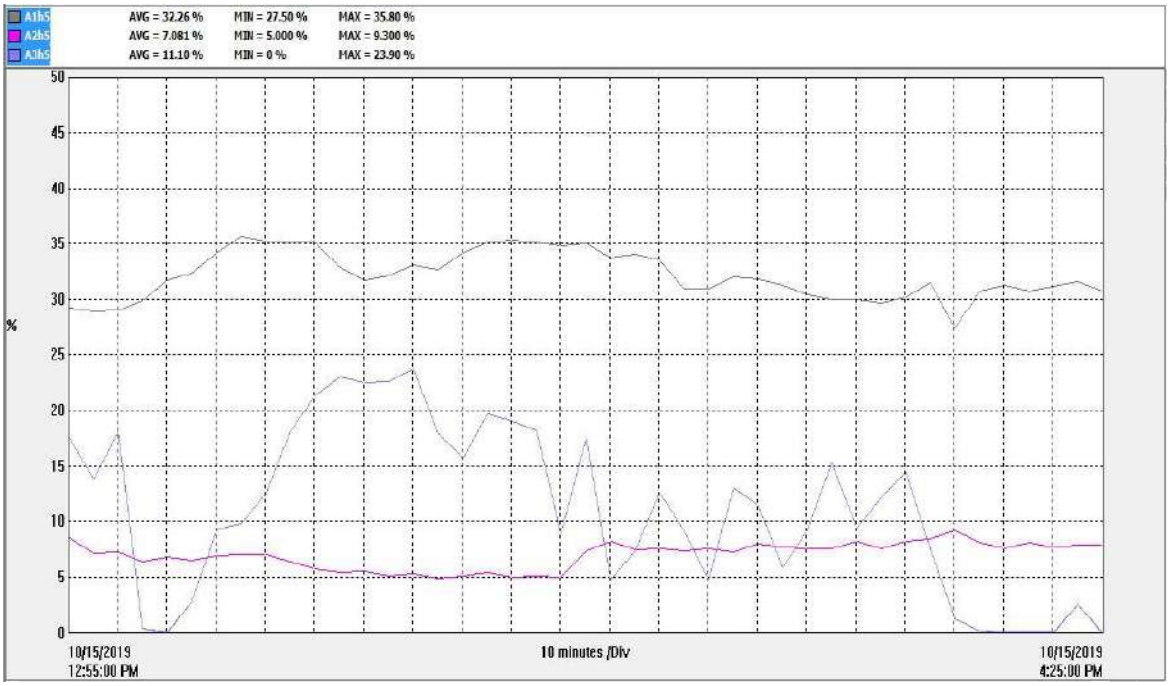

Fig 186. Shows the 5th order THD (Voltage Harmonic) for 4.20hours from 15/10/2019 12.55PM to 15/10/2019 4.25PM

Inference: As THD is high, it is recommended to have harmonic filter as preventive measure against equipment failures.

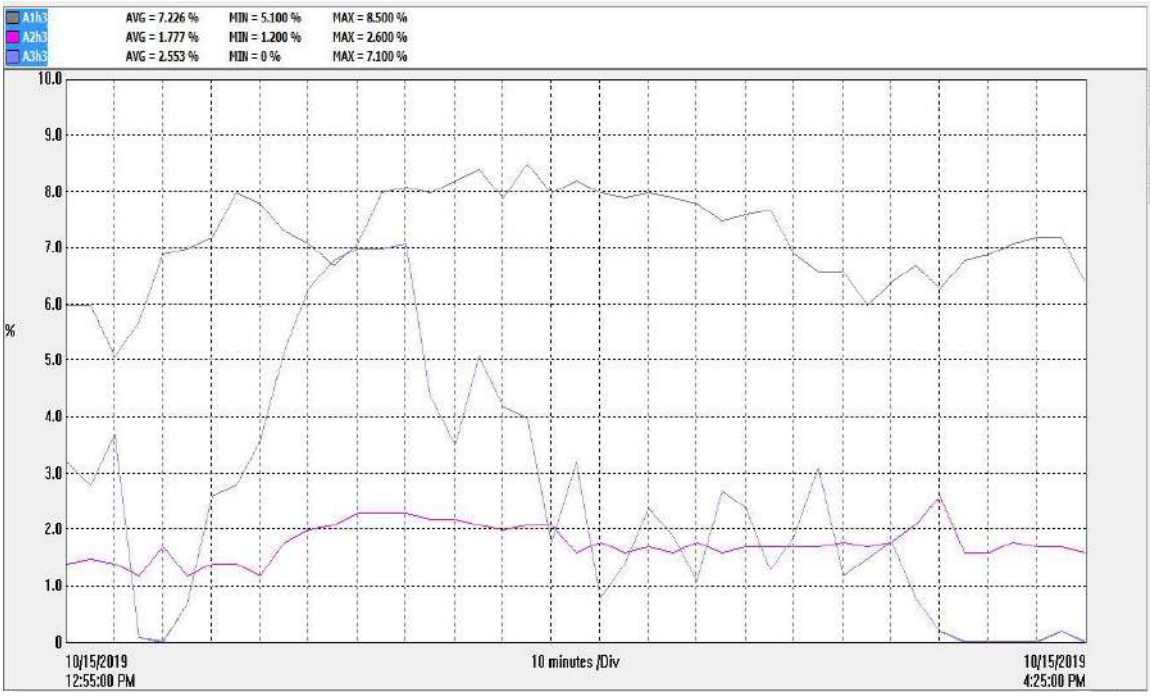

Fig 187 Shows the 3rd order THD (voltage harmonics) for 4.20hours from 15/10/2019 12.55PM to 15/10/2019 4.25PM

Inference: Harmonics seems to be normal. No need of harmonic filters.

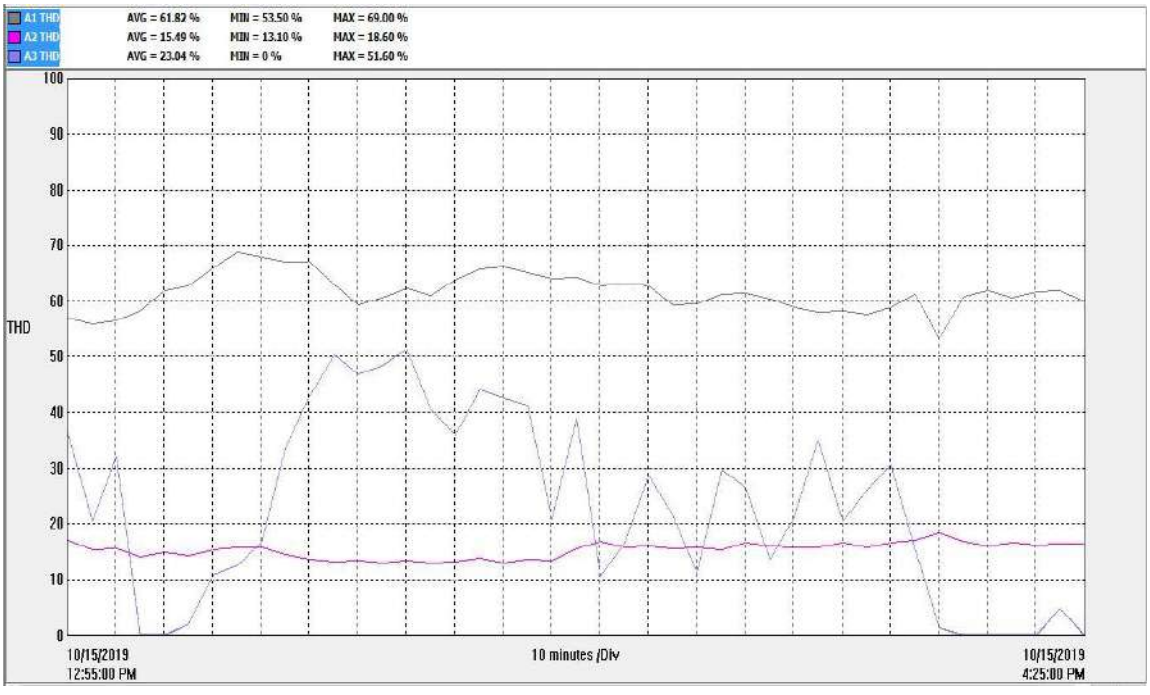

Fig 188. Shows the THD (Voltage Harmonic) for 4.20hours from 15/10/2019 12.55PM to 15/10/2019 4.25PM

Inference: As THD is high, it is recommended to have harmonic filter as preventive measure against equipment failures.

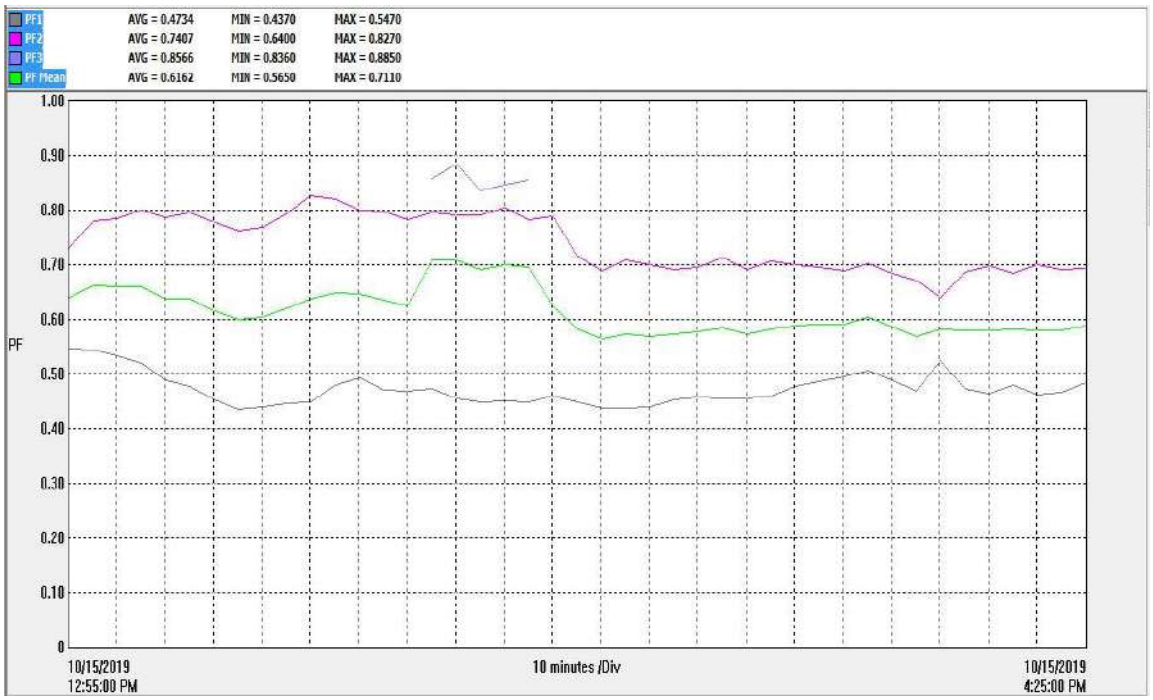

Fig 189. Shows the power factor (PF) for 4.20hours from 15/10/2019 12.55PM to 15/10/2019 4.25PM

Inference: Unbalanced found here. Need to be improve the PF.

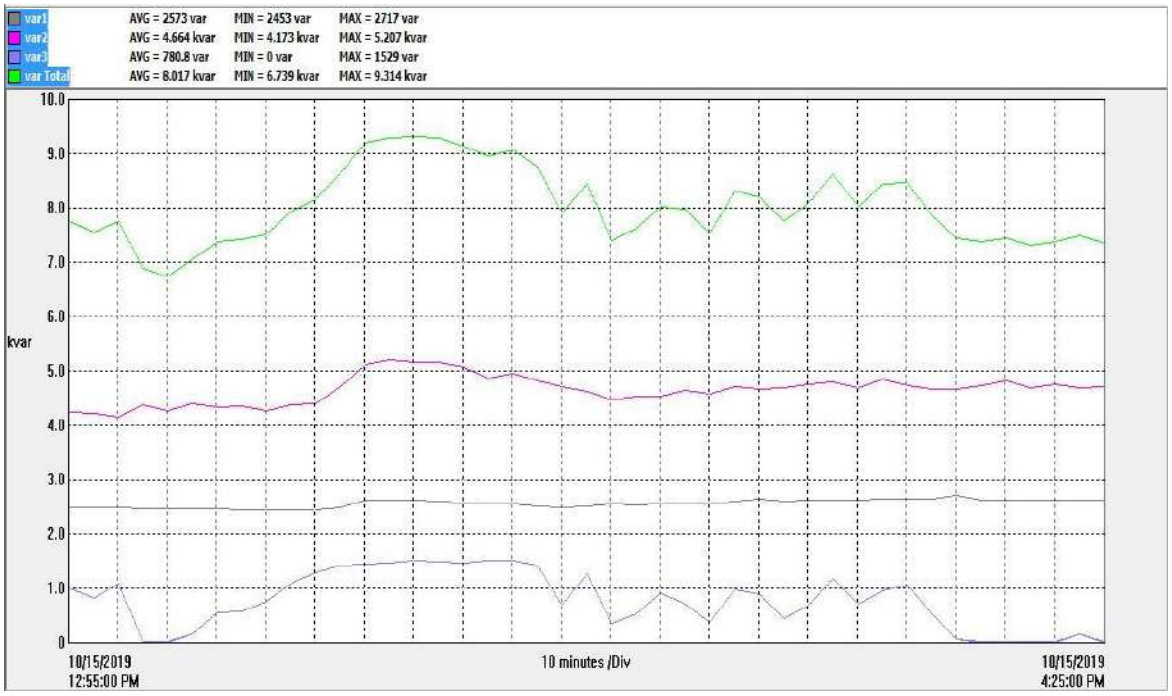

Fig 190. Shows the reactive power (kVAR) for 4.20hours from 15/10/2019 12.55PM to 15/10/2019 4.25PM

Inference: Phase 3 shows very low KVAR compare to other two phases.

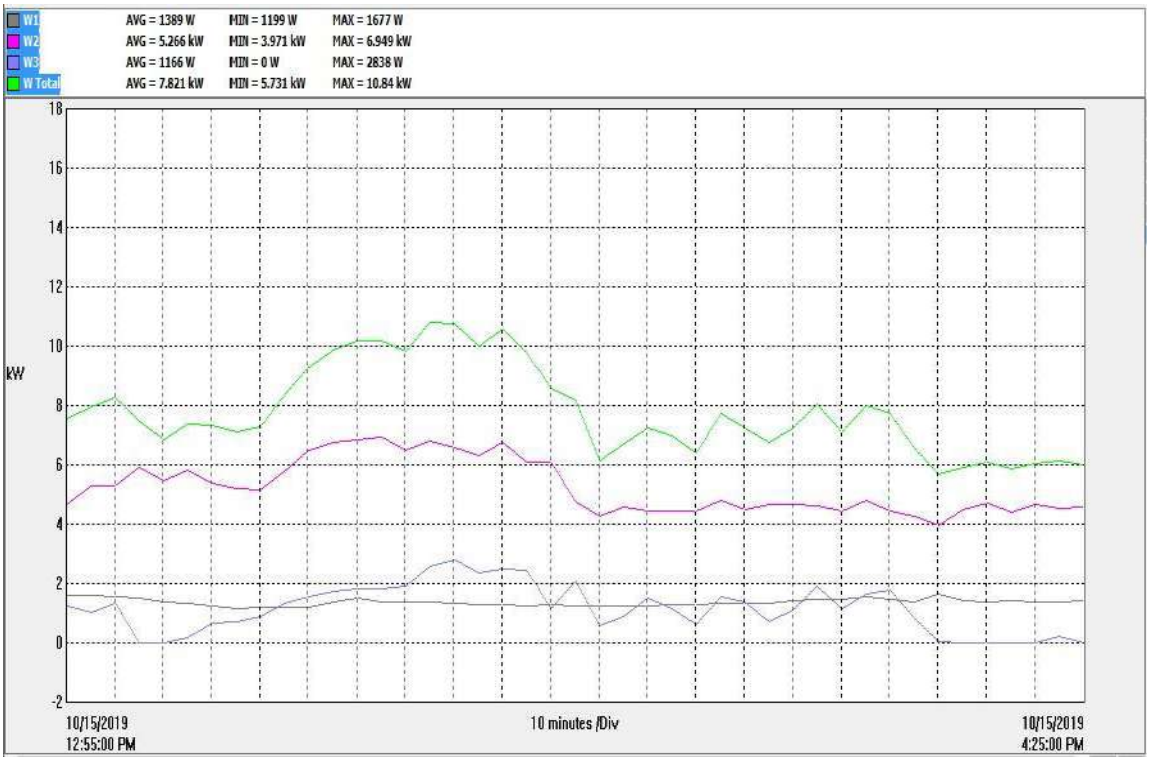

Fig 191. Shows the power (kW) for 4.20hours from 15/10/2019 12.55PM to 15/10/2019 4.25PM
Inference: Power distribution is not balanced. Phase 3 is found to be Unbalance. It is loaded only 15% of the total.

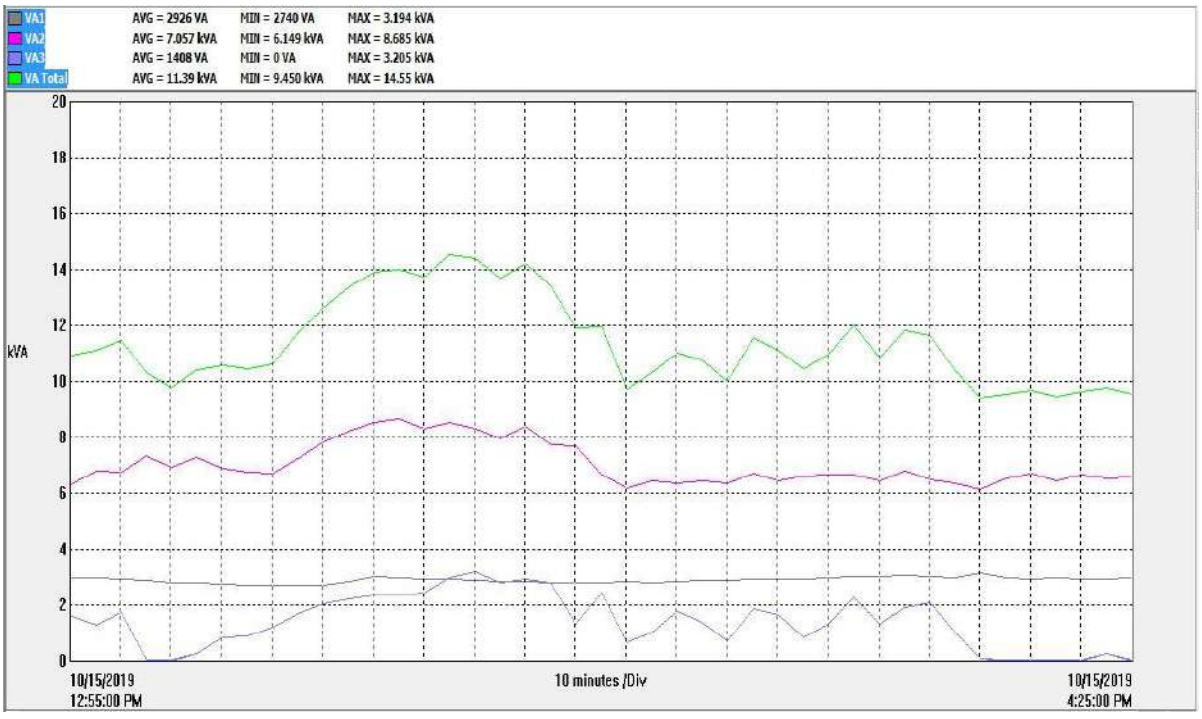

Fig 192. Shows the power (kVA) for 4.20hours from 15/10/2019 12.55PM to 15/10/2019 4.25PM
Inference: Power distribution is not balanced. Phase 2 is found to be Unbalance.

AUDITORIUM – AC

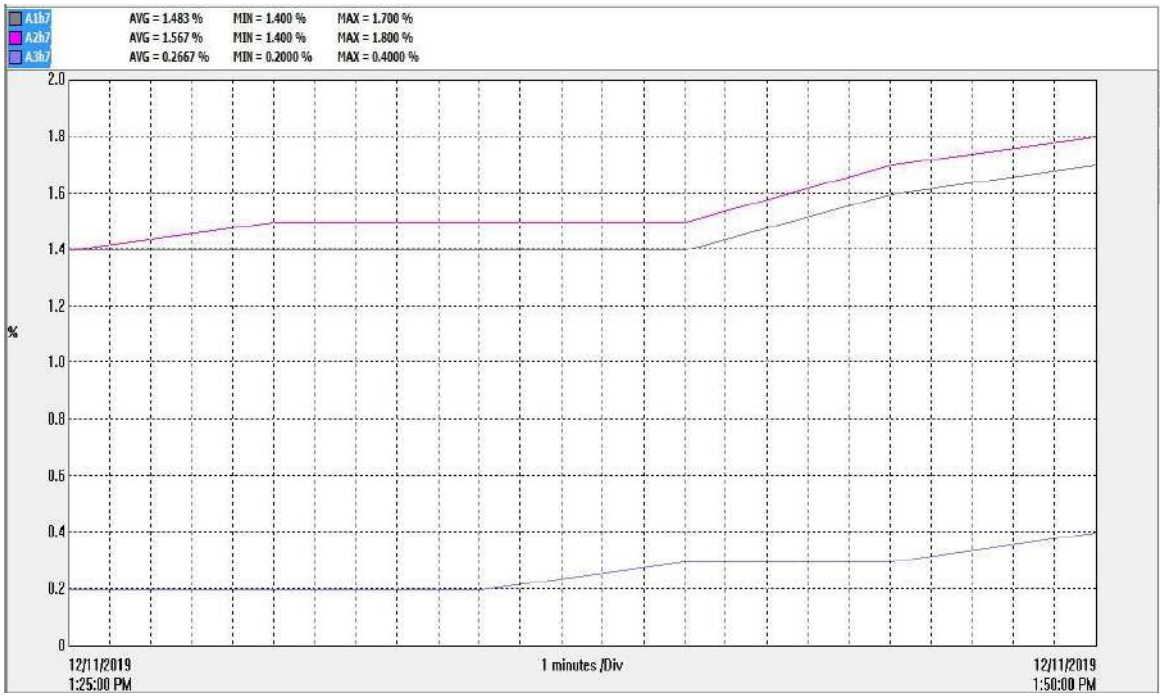

Fig 193. Shows the 7th order THD (Voltage Harmonic) for 25 minuess from 11/12/2019 12.25PM to 11/12/2019 12.50PM

Inference: Harmonics seems to be normal. No need of harmonic filters.

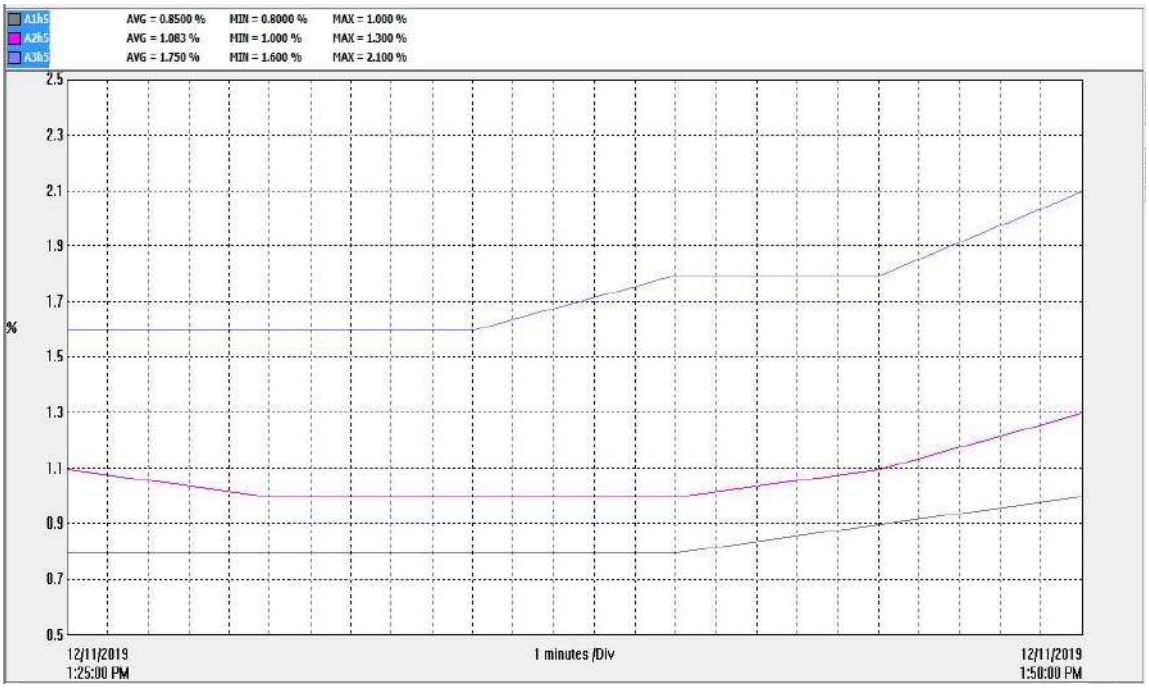

Fig 194. Shows the 7th order THD (Voltage Harmonic) for 25 minuess from 11/12/2019 12.25PM to 11/12/2019 12.50PM

Inference: Harmonics seems to be normal. No need of harmonic filters.

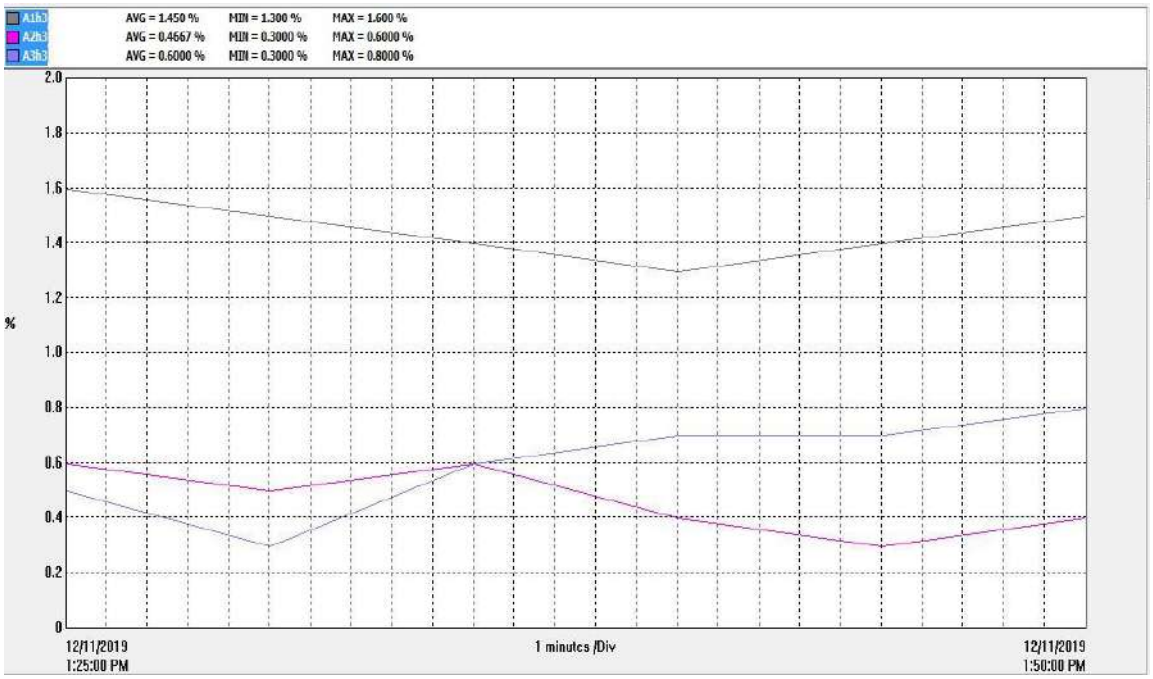

Fig 195. Shows the 5th order THD (Voltage Harmonic) for 25 minuess from 11/12/2019 12.25PM to 11/12/2019 12.50PM

Inference: Harmonics seems to be normal. No need of harmonic filters.

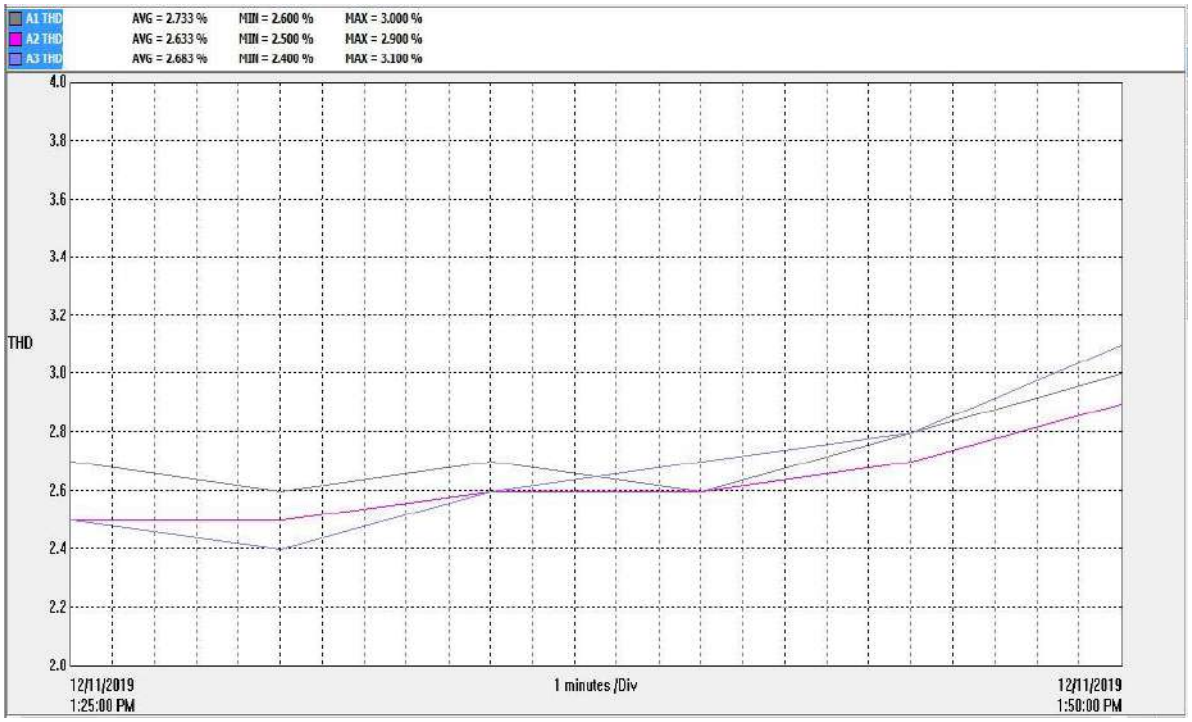

Fig 196.Shows the THD (Voltage Harmonic) for 25 minuess from 11/12/2019 12.25PM to 11/12/2019 12.50PM

Inference: Inference: Harmonics seems to be normal. No need of harmonic filters.

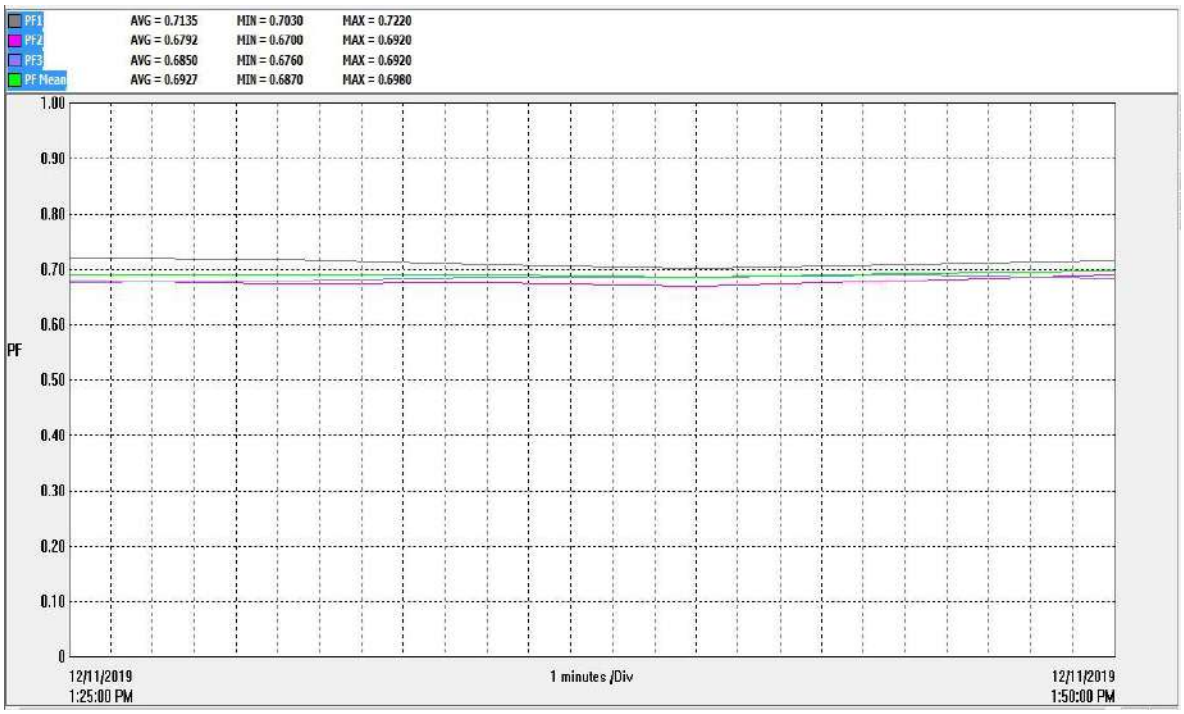

Fig 197.Shows the power factor (PF) for 25 minuess from 11/12/2019 12.25PM to 11/12/2019 12.50PM

Inference: No unbalanced found here. Need to be improve the PF.

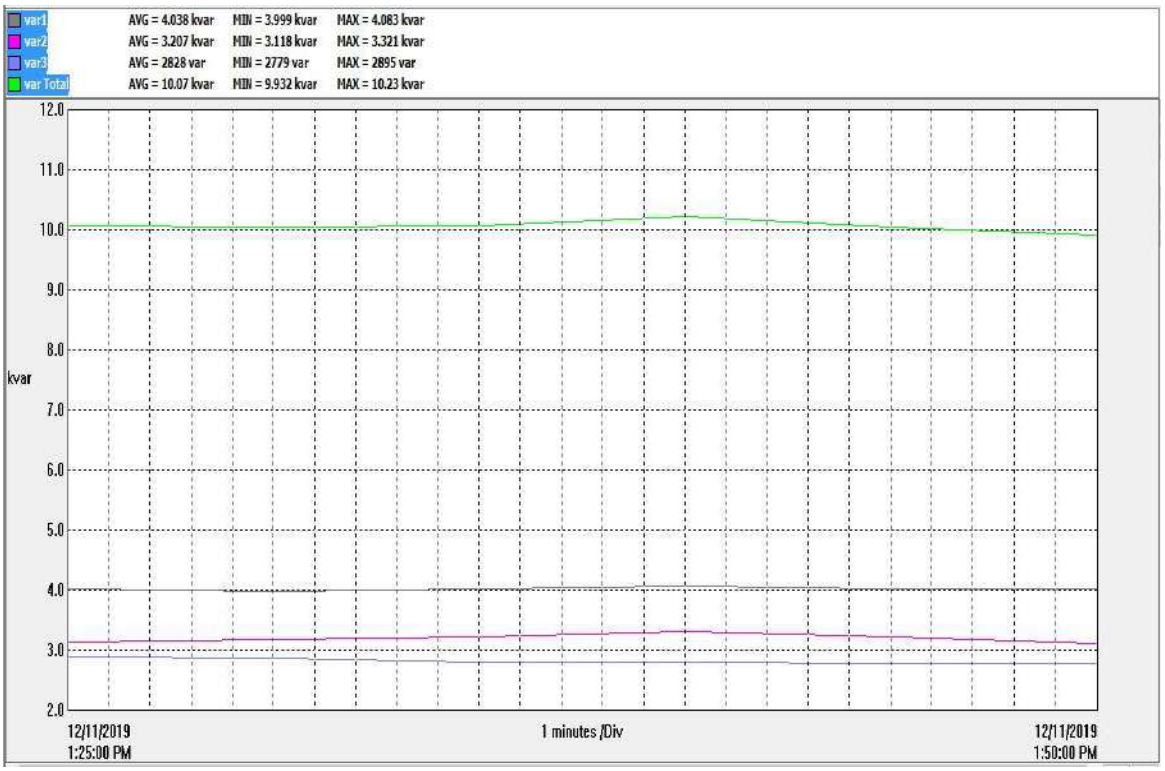

Fig 198. Shows the reactive power (kVAR) for 25 minuess from 11/12/2019 12.25PM to 11/12/2019 12.50PM

Inference: No unbalanced found here.

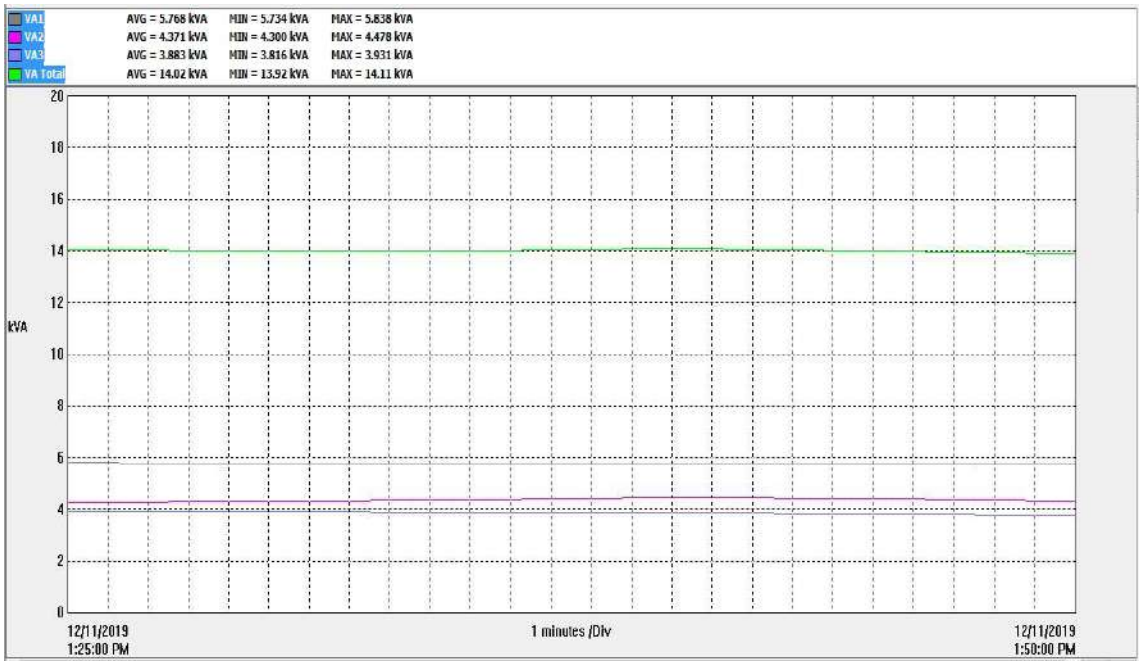

Fig 199. Shows the power (kVA) for 25 minuess from 11/12/2019 12.25PM to 11/12/2019 12.50PM

Inference: No unbalanced found here.

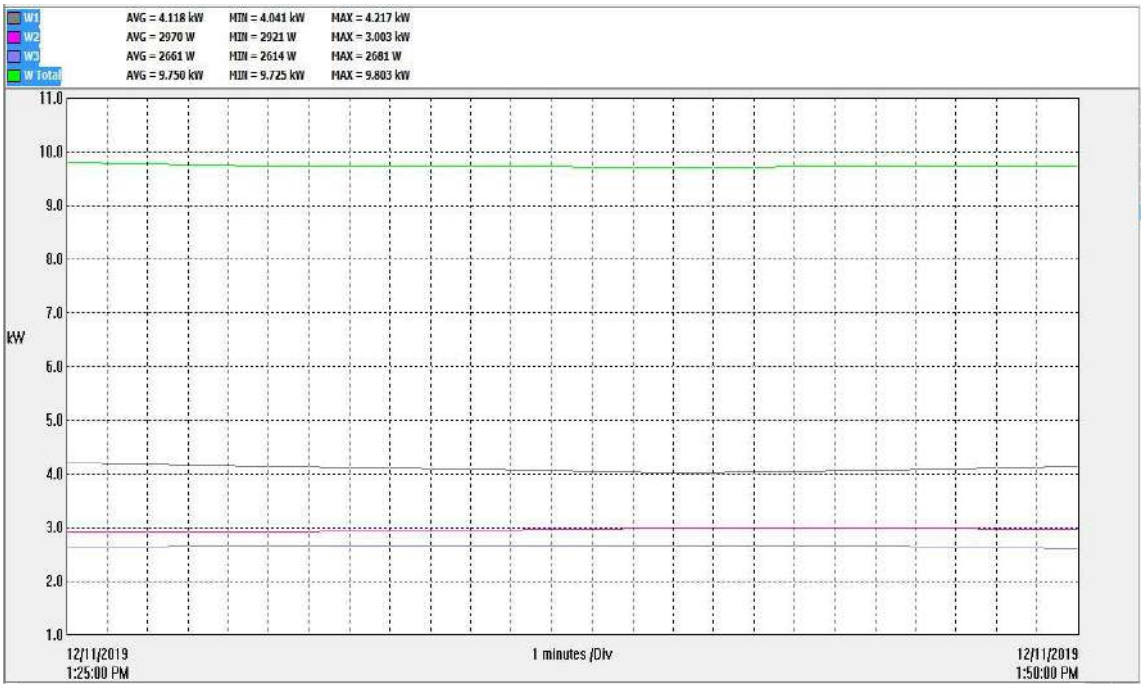

Fig 200. Shows the power (kW) for 25minutes from 11/12/2019 12.25PM to 11/12/2019 12.50PM

Inference: Power distribution found to be normal.

AUDITORIUM- LIGHTING

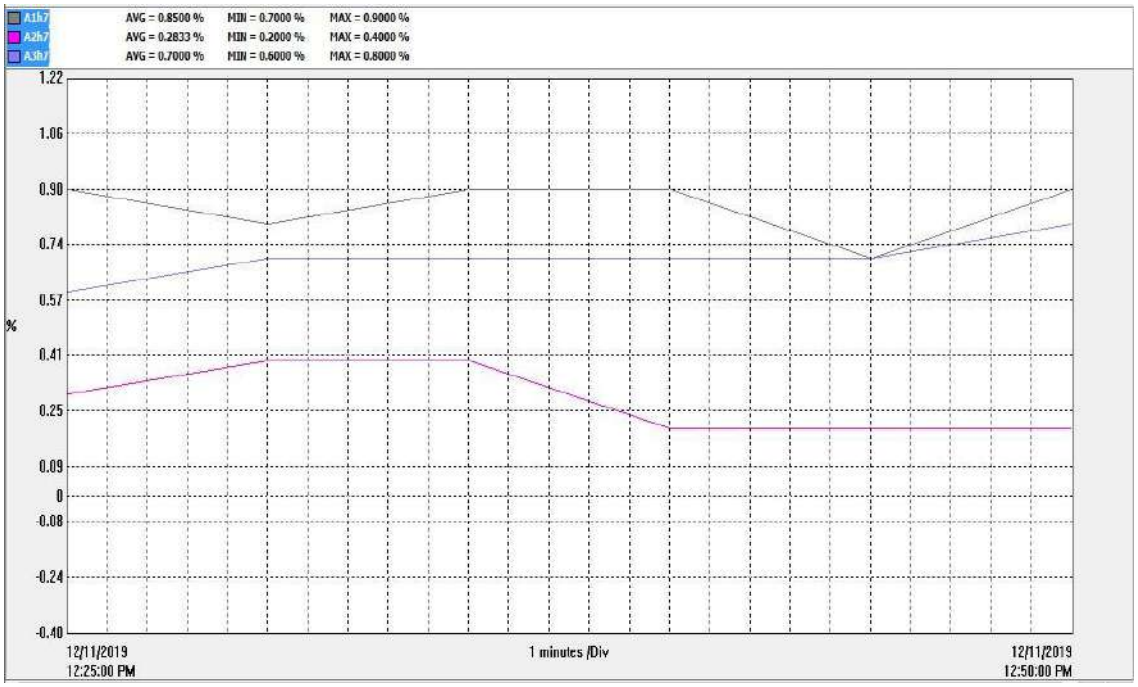

Fig 201. Shows the 7th order THD (Voltage Harmonic) for 25 minuess from 11/12/2019 12.25PM to 11/12/2019 12.50PM

Inference: Harmonics seems to be normal. No need of harmonic filters.

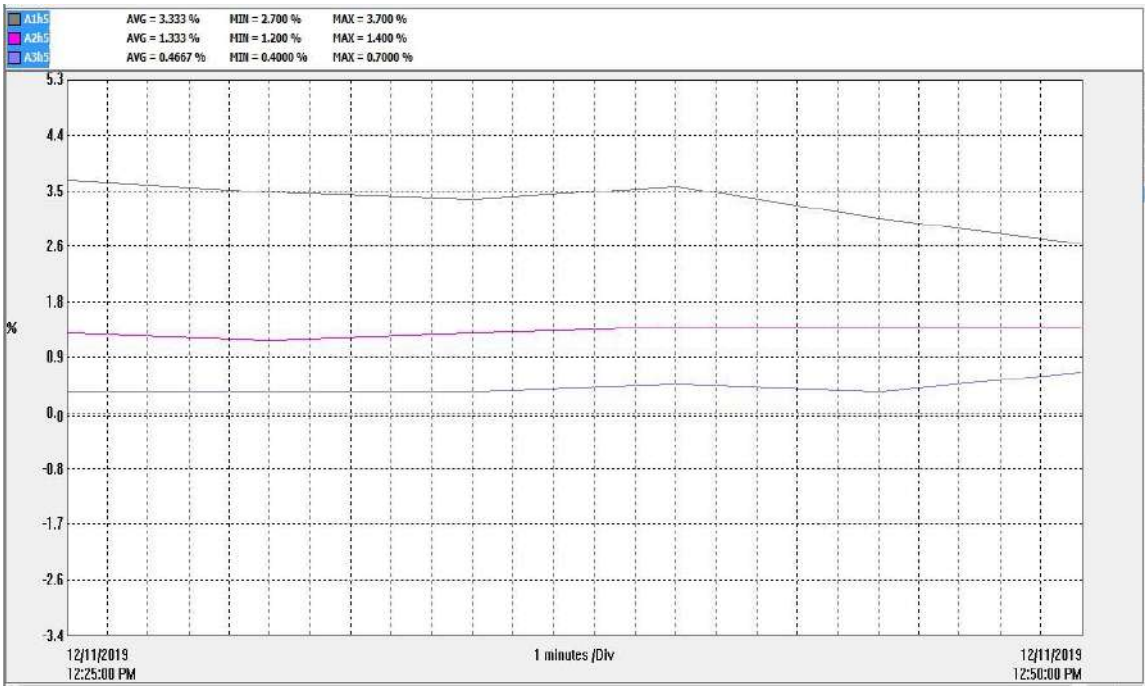

Fig 202. Shows the 5th order THD (Voltage Harmonic) for 25 minuess from 11/12/2019 12.25PM to 11/12/2019 12.50PM

Inference: Harmonics seems to be normal. No need of harmonic filters.

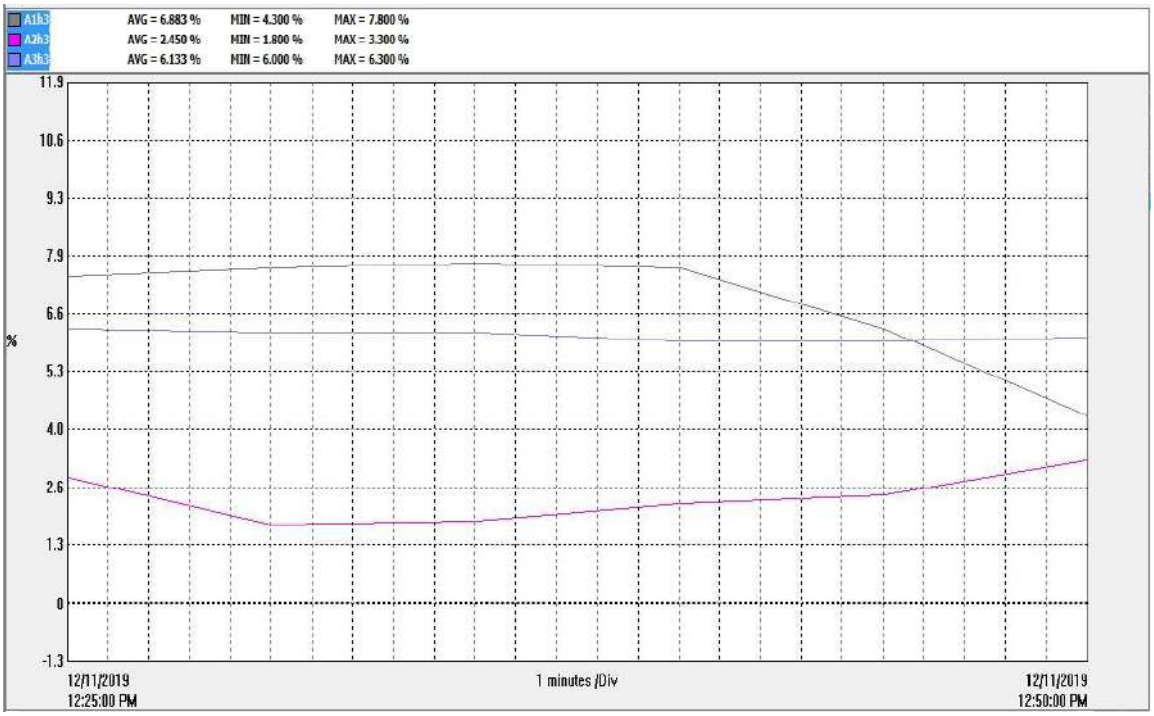

Fig 203. Shows the 3rd order THD (voltage harmonics) 25 minuess from 11/12/2019 12.25PM to 11/12/2019 12.50PM

Inference: Harmonics seems to be normal. No need of harmonic filters.

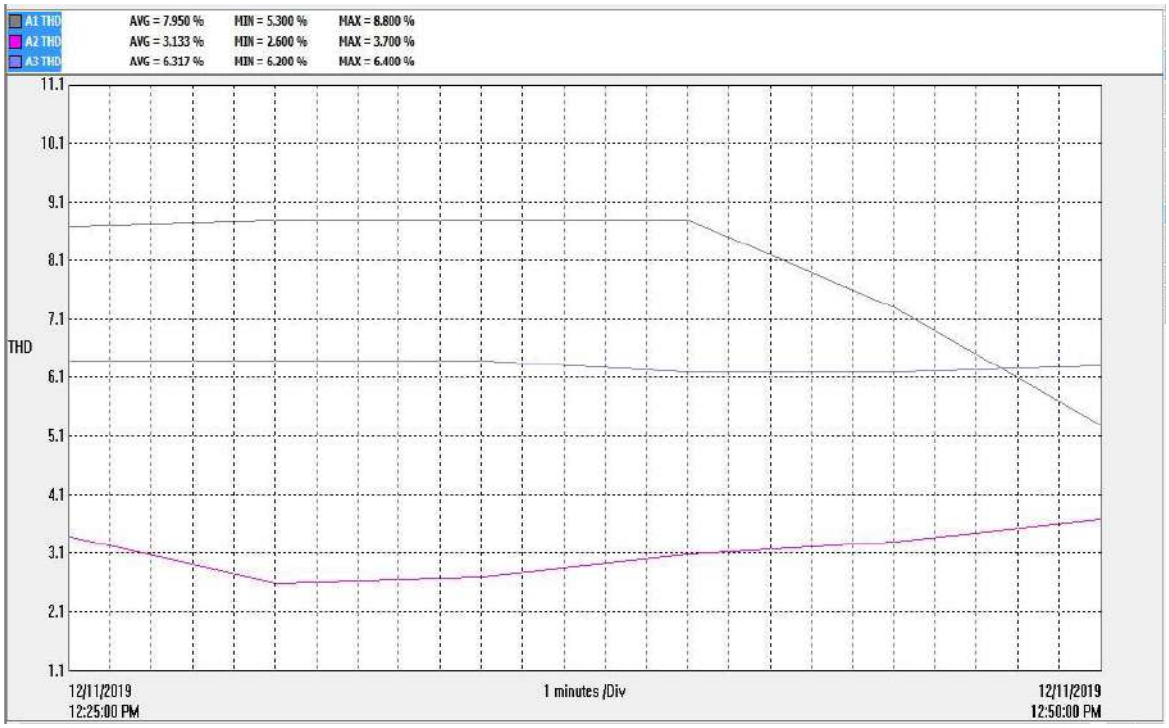

Fig 204. Shows the THD (Voltage Harmonic) for 25 minuess from 11/12/2019 12.25PM to 11/12/2019 12.50PM

Inference: Harmonics seems to be normal. No need of harmonic filters.

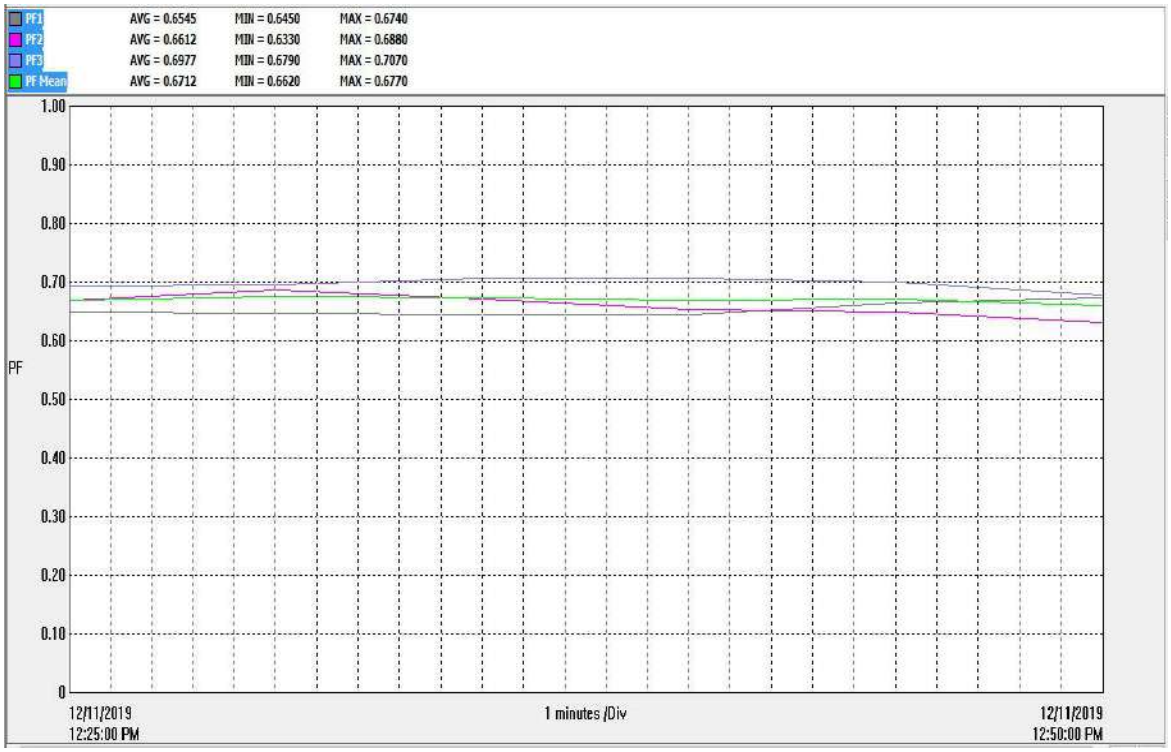

Fig 205. Shows the power factor (PF) for 25 minuess from 11/12/2019 12.25PM to 11/12/2019 12.50PM

Inference: No unbalanced found here. Need to be improve the PF.

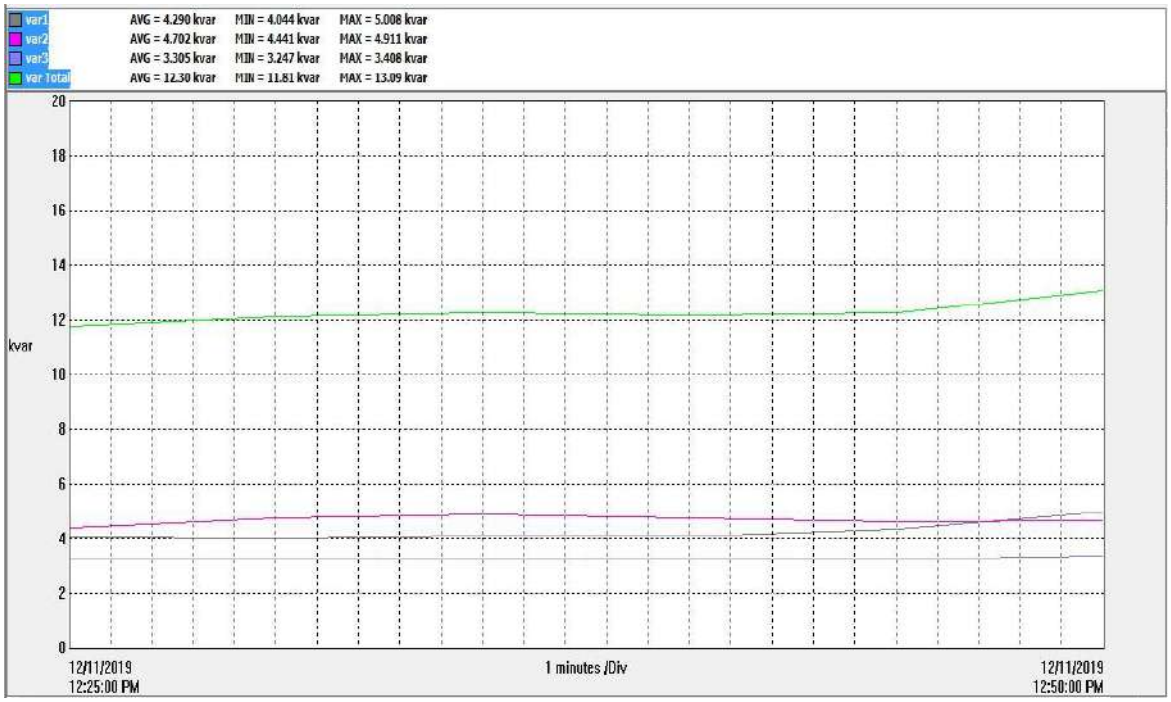

Fig 206. Shows the reactive power (kVAR) for 25 minuess from 11/12/2019 12.25PM to 11/12/2019 12.50PM

Inference: No abnormal found here.

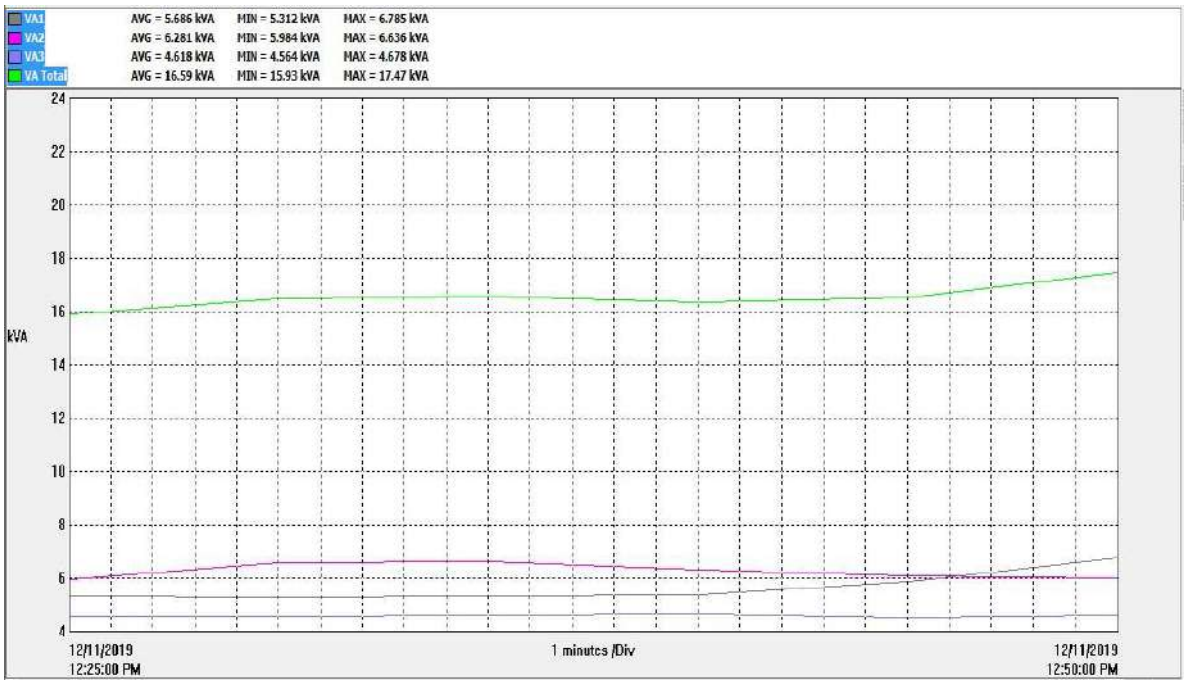

Fig 207. Shows the power (kVA) for 25 minuess from 11/12/2019 12.25PM to 11/12/2019 12.50PM
Inference: power distribution is balanced in condition.

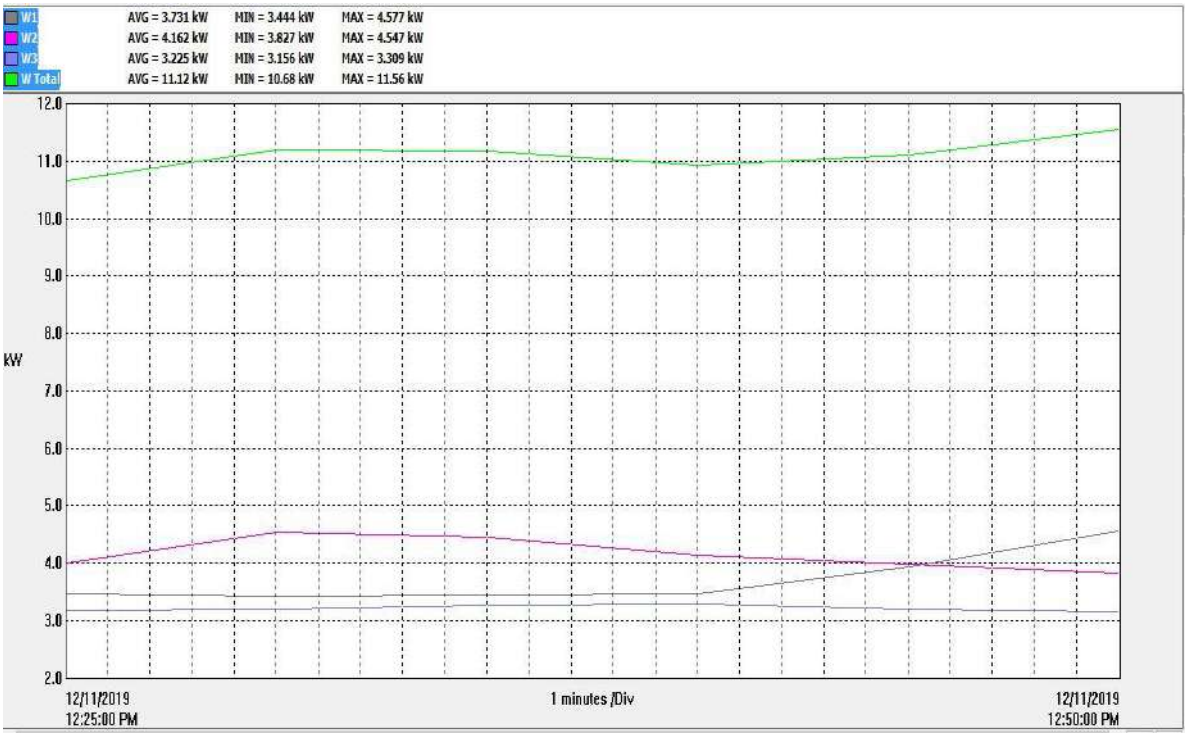

Fig 208. Shows the power (kW) for 25minutes from 11/12/2019 12.25PM to 11/12/2019 12.50PM
Inference: Balanced power distribution is found here.