Foundational Blocks for Smart Grids

Implementation of Smart Pillar Box With Digital Communication in LT Distribution System

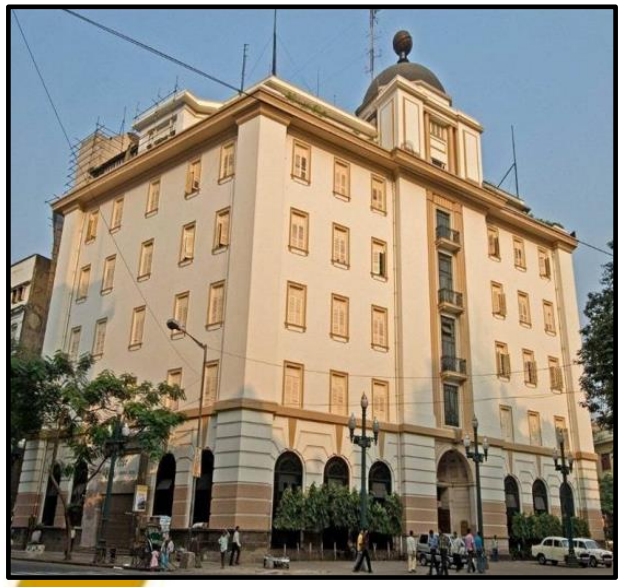
Speaker : *Nirvik Biswas, Asst. Manager, CESC LTD*

Introduction

Company name: **CESC Limited**

Scope: Generation & Distribution of electricity across 567 sq. km in Kolkata & Howrah in West Bengal

Registered Office: CESC House, Chowringhee Square, Kolkata - 700001



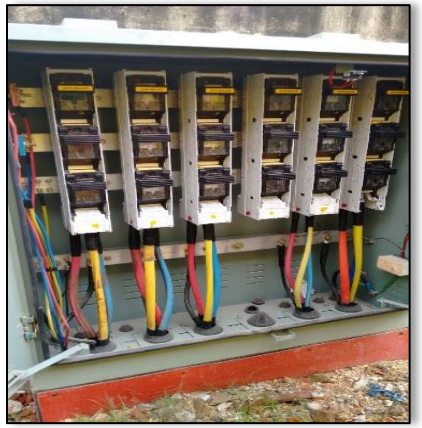
CESC House
Head Office of CESC Limited
A heritage building built in 1933

Brief Company details	
Website	www.cesc.co.in
Managing Director (Generation)	Mr. Rabi Chowdhury
Managing Director (Distribution)	Mr. Debasish Banerjee
Employee Strength **In CESC's direct payroll : 7,377**	Officers - 792 (including 4 PTMOs) JMS - 139 Non covenanted employees – 6,446 Contracted workforce – 4,475
Turnover (in Rs. Crores) in FY21	Rs. 7,101 Crores
Consumer base	LT ~ 3.4 million, HT ~ 1,700

Context

Perennial Problems in our System

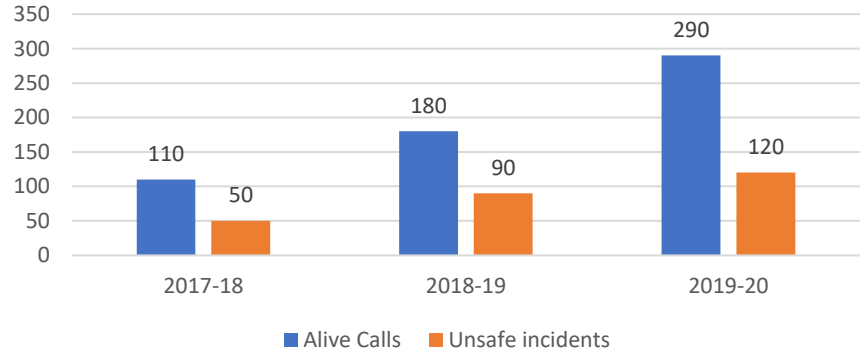
1. Submergence of bottom of Pillar Box under water during any deluge subsequently the body of the Pillar Box becoming alive.
2. Longer restoration time due to LT HRC Fuse failure in transformers resulting in revenue loss
3. Revenue loss due to delay in restoration of Pillar Box HRC Fuse Failure

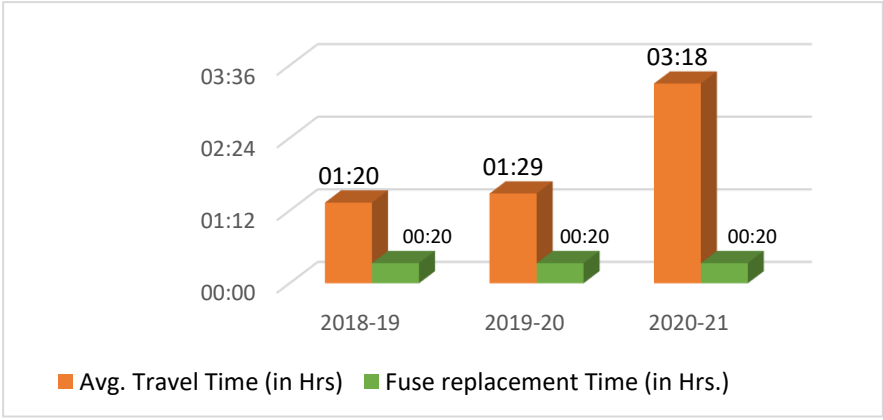


Relevance

Problem Measurement

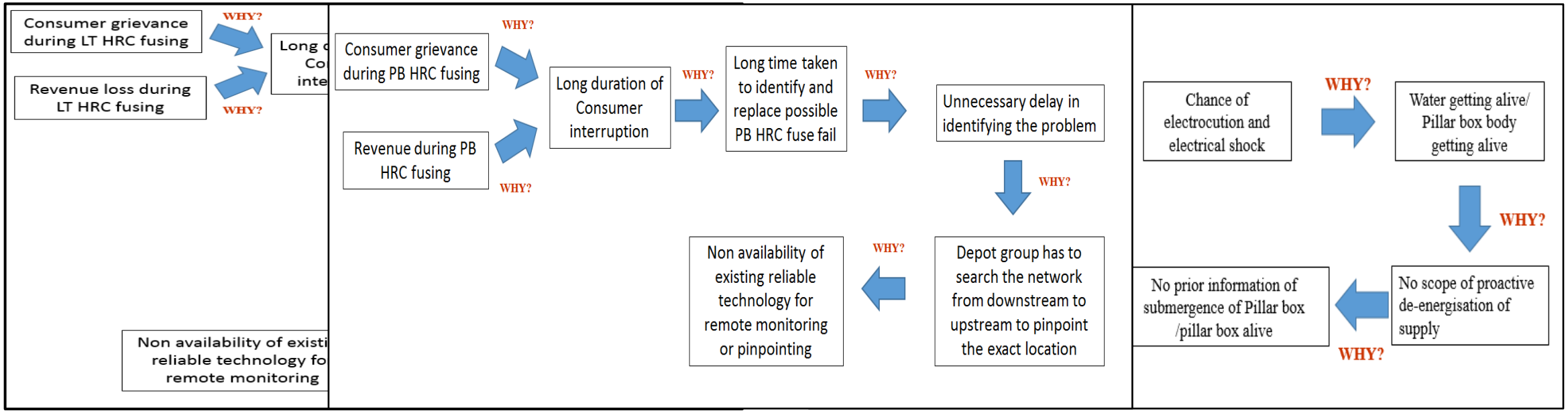
1. The increasing trend of Alive Calls and unsafe incidents suggest that there is an urgent need of incorporation of some preventive/proactive measures
2. The increase in ART of restoration of PB Fuse calls and DTR LT HRC Fuse calls clearly indicates that we have to look out for a proactive solution to decrease the revenue loss due to delay in restoration.





Presentation on the Topic

- Root Cause/Why-Why Analysis of the Problems



DTR LT HRC Fusing

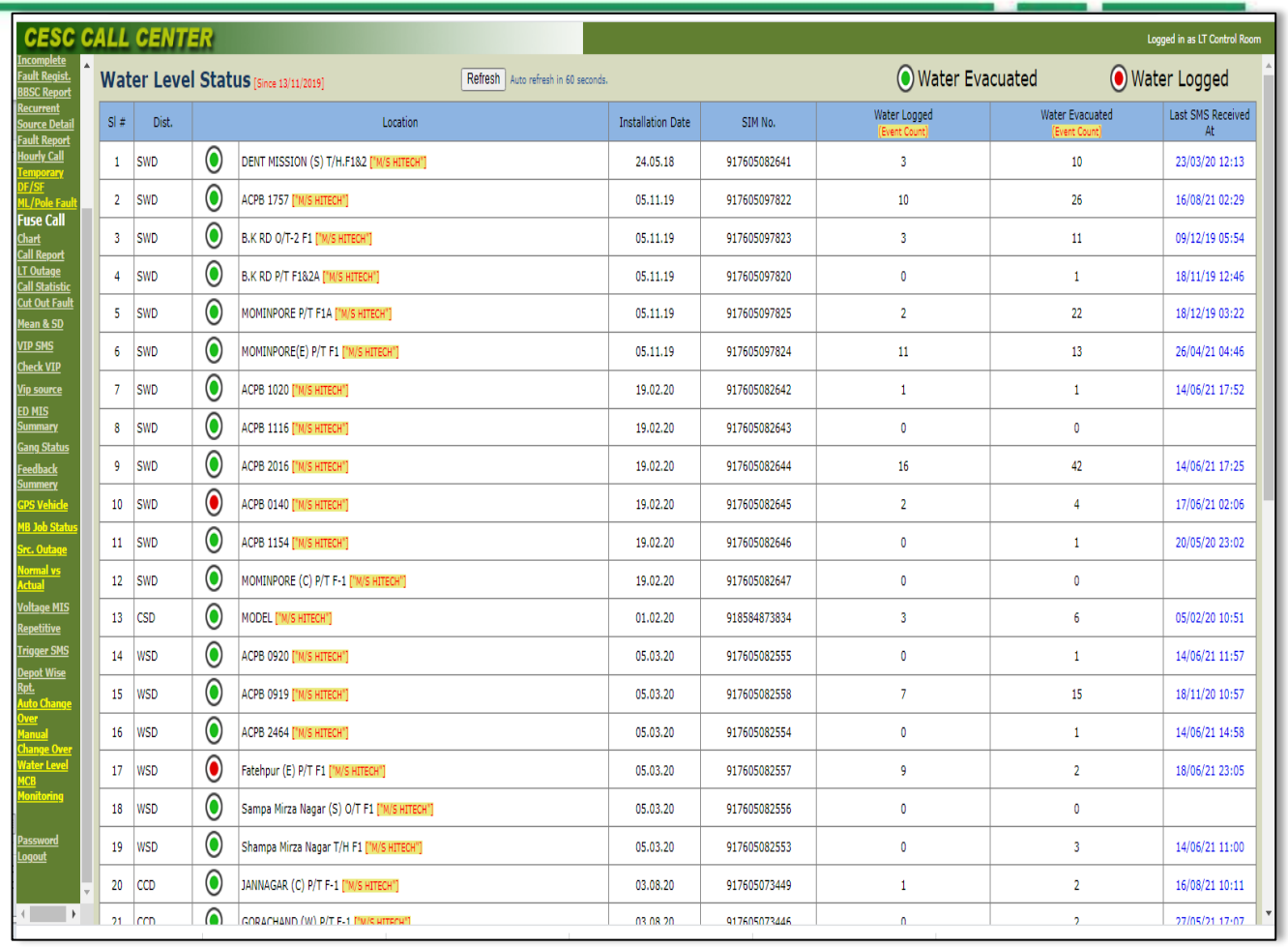
Pillar Box Fusing

Submergence of Pillar Box in Waterlogged Area

Presentation on the Topic

Water Level Indicator

- Sensors introduced in the Pillar boxes for measuring water level.
- Pillar Box installed in the waterlogged area are judiciously chosen.
- A dashboard has been prepared in order to monitor the data fetched from these sensors installed in the pillar boxes.
- GSM based communication module installed in the pillar boxes



CESC CALL CENTER

Logged in as LT Control Room

Incomplete
Fault Regist.
BBSC Report
Recurrent
Source Detail
Fault Report
Hourly Call
Temporary
DF/SF
ML/Pole Fault
Fuse Call
Chart
Call Report
LT Outage
Call Statistic
Cut Out Fault
Mean & SD
VIP SMS
Check VIP
Vip source
ED MIS Summary
Gang Status
Feedback Summery
GPS Vehicle
MB Job Status
Src. Outage
Normal vs Actual
Voltage MIS
Repetitive
Trigger SMS
Depot Wise Rpt.
Auto Change Over
Manual Change Over
Water Level
MCB Monitoring
Password
Logout

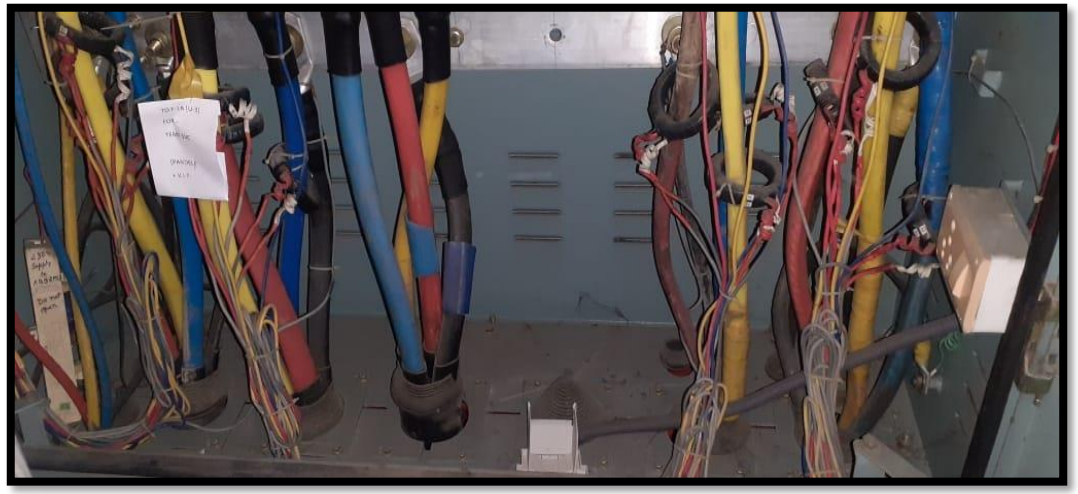
Water Level Status [Since 13/11/2019] Refresh Auto refresh in 60 seconds. Water Evacuated Water Logged

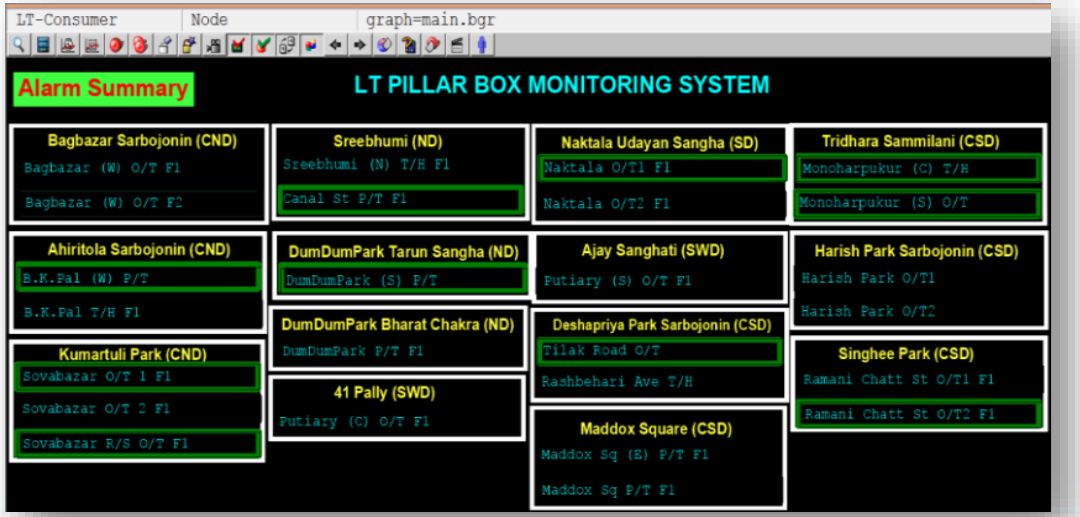
Sl #	Dist.		Location	Installation Date	SIM No.	Water Logged Event Count	Water Evacuated Event Count	Last SMS Received At
1	SWD		DENT MISSION (S) T/H.F1&2 ["M/S HITECH"]	24.05.18	917605082641	3	10	23/03/20 12:13
2	SWD		ACPB 1757 ["M/S HITECH"]	05.11.19	917605097822	10	26	16/08/21 02:29
3	SWD		B.K RD O/T-2 F1 ["M/S HITECH"]	05.11.19	917605097823	3	11	09/12/19 05:54
4	SWD		B.K RD P/T F1&2A ["M/S HITECH"]	05.11.19	917605097820	0	1	18/11/19 12:46
5	SWD		MOMINPORE P/T F1A ["M/S HITECH"]	05.11.19	917605097825	2	22	18/12/19 03:22
6	SWD		MOMINPORE(E) P/T F1 ["M/S HITECH"]	05.11.19	917605097824	11	13	26/04/21 04:46
7	SWD		ACPB 1020 ["M/S HITECH"]	19.02.20	917605082642	1	1	14/06/21 17:52
8	SWD		ACPB 1116 ["M/S HITECH"]	19.02.20	917605082643	0	0	
9	SWD		ACPB 2016 ["M/S HITECH"]	19.02.20	917605082644	16	42	14/06/21 17:25
10	SWD		ACPB 0140 ["M/S HITECH"]	19.02.20	917605082645	2	4	17/06/21 02:06
11	SWD		ACPB 1154 ["M/S HITECH"]	19.02.20	917605082646	0	1	20/05/20 23:02
12	SWD		MOMINPORE (C) P/T F-1 ["M/S HITECH"]	19.02.20	917605082647	0	0	
13	CSD		MODEL ["M/S HITECH"]	01.02.20	918584873834	3	6	05/02/20 10:51
14	WSD		ACPB 0920 ["M/S HITECH"]	05.03.20	917605082555	0	1	14/06/21 11:57
15	WSD		ACPB 0919 ["M/S HITECH"]	05.03.20	917605082558	7	15	18/11/20 10:57
16	WSD		ACPB 2464 ["M/S HITECH"]	05.03.20	917605082554	0	1	14/06/21 14:58
17	WSD		Fatehpur (E) P/T F1 ["M/S HITECH"]	05.03.20	917605082557	9	2	18/06/21 23:05
18	WSD		Sampa Mirza Nagar (S) O/T F1 ["M/S HITECH"]	05.03.20	917605082556	0	0	
19	WSD		Shampa Mirza Nagar T/H F1 ["M/S HITECH"]	05.03.20	917605082553	0	3	14/06/21 11:00
20	CCD		JANNAGAR (C) P/T F-1 ["M/S HITECH"]	03.08.20	917605073449	1	2	16/08/21 10:11
21	CCD		GORACHAND (W) P/T F-1 ["M/S HITECH"]	03.08.20	917605073446	0	2	27/05/21 17:07

Presentation on the Topic

Installation of Pillar Box HRC fuse fail indicator device

- Introducing Sensors for measuring the electrical parameters from remote
- Installing GSM based communication module
- Chalking out the pillar boxes according to their sensitivity
- Developing a dashboard to monitor the data fetched from these sensors to detect the outage due to fusing





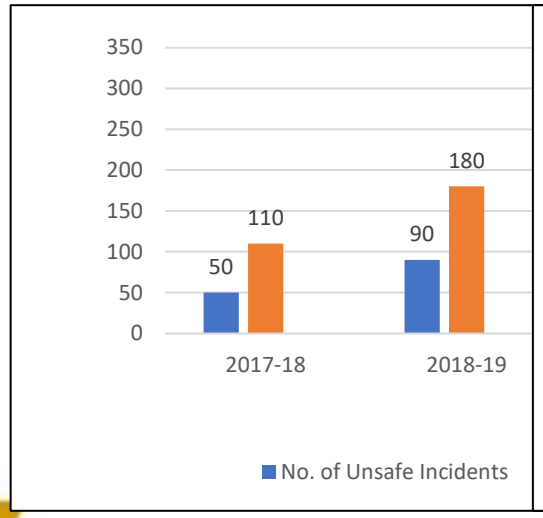
Presentation on the Topic

DTR LT HRC Fuse Failure Indicator inside Pillar Box

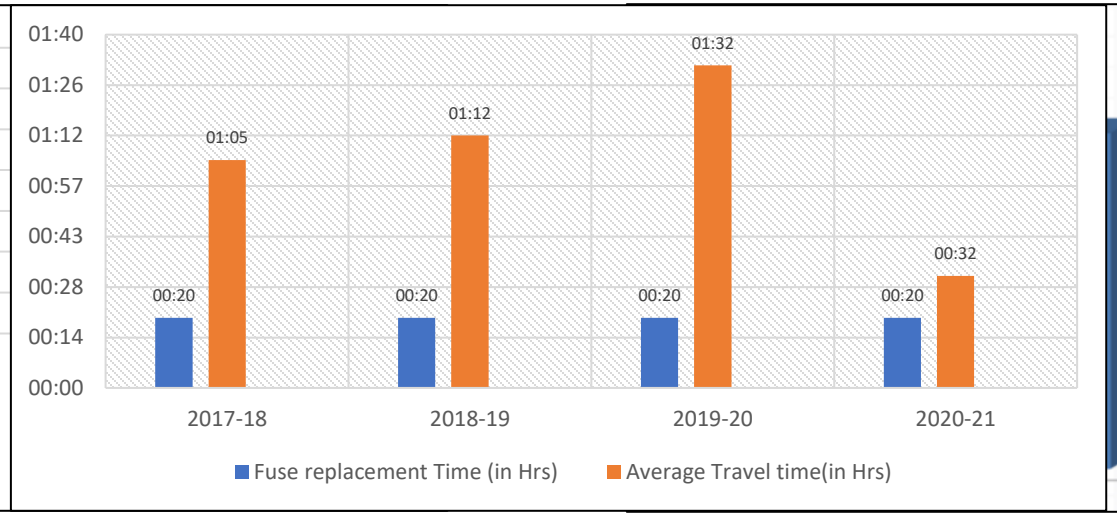
- Introducing Sensors for measuring the voltage of the incomer cables emanating from DTR
- Installing GSM based communication module
- Flagging out SMS during missing potential for any one or two phases simultaneously
- Mitigating staggered movement

Use Case/Case Study

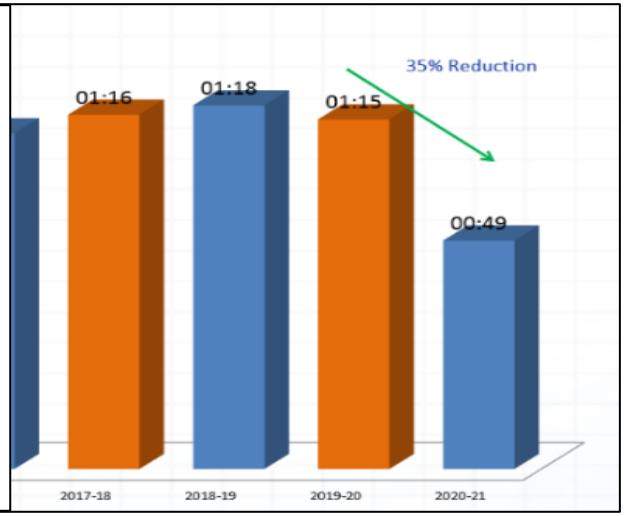
Tangible Gains for 400 no of Smart Pillar Boxes in Water Logged Areas



Tangible Gains for 400 no of Smart Pillar Boxes having DFI



Tangible Gains for 400 no of Smart Pillar Boxes for ART of Fuse Calls



Key Takeaways/ Recommendations

- Technology infusion in traditionally used equipment has transformed the LT distribution system of CESC.
- Consumer safety has been prioritized and proactive information gathering through water level indicators will expedite rapid action to avoid electrical hazard to pedestrians.
- The digital revolution sparked in the Outage Management domain by the Fuse Failure Indicators not only minimizes consumer down-time, but also results in huge revenue savings for the utility.
- The steady transformation has begun towards a new and better CESC LT system where proactive instead of reactive action is the norm.


STAY SAFE
ThanK YoU!

ANY QUERIES