Bhagwat Swaroop Sharma

From: Bhagwat Swaroop Sharma
Sent: Wednesday, November 30, 2022 10:34 PM
To: iro.gandhingr-mefcc@gov.in; eccompliance-guj@gov.in
Cc: ec-rdw.cpcb@gov.in; ro-gpcb-kute@gujarat.gov.in; ms-gpcb@gujarat.gov.in; direnv@gujarat.gov.in; Snehal Jariwala
Subject: Half Yearly EC Compliance Report AMSIPL-2010 Submission for Period April'22 to Sept.'22
Attachments: 2010 - EC Compliance Report Apr to Sep'22_AMSIPL, Mundra.pdf

adani
Ports and Logistics

APSEZL/EnvCell/2022-23/079

To
The Inspector General of Forest / Scientist C,
Integrated Regional Office (IRO),
Ministry of Environment, Forest and Climate Change,
Aranya Bhawan, A Wing, Room No. 409,
Near CH 3 Circle, Sector – 10A,
Gandhinagar – 382007.
E-mail: eccompliance-guj@gov.in, iro.gandhingr-mefcc@gov.in

Sub : Half yearly Compliance report for Environment Clearance for tl project" at Survey no. 141 (part), village: Mundra, Dist. K Infrastructure Pvt. Ltd."

Ref : Environment clearance granted to Adani Mundra SEZ Infrastruc February, 2010 bearing SEIAA letter no. SEIAA/GUJ/EC/8(b)/44 /

Dear Sir,

Please refer to the above cited reference for the said subject matter. In conn copy of the compliance report for the Environmental Clearance for the perio being submitted through soft copy (e-mail communication & CD).

Kindly consider above submission and acknowledge.

Thank you,
Yours Faithfully,
For, **M/s Adani Ports and Special Economic Zone Limited**

Douglas Charles Smith
Chief Executive Officer
Mundra & Tuna Port

Thanks & Regards,

Bhagwat Swaroop Sharma
Sr. Manager - Environment
Mundra & Tuna port

Adani Ports & Special Economic Zone Ltd.

Environment Cell | 1st floor | Adani House | Mundra Kutch | 370421 | Gujarat | India
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Ports and
Logistics

APSEZL/EnvCell/2022-23/079 **Date:** 21.11.2022

To
The Inspector General of Forest / Scientist C,
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Ministry of Environment, Forest and Climate Change,
Aranya Bhawan, A Wing, Room No. 409,
Near CH 3 Circle, Sector – 10A,
Gandhinagar – 382007.
E-mail: eccompliance-guj@gov.in, iro.gandhingr-mefcc@gov.in

Sub : Half yearly Compliance report for Environment Clearance for the "Township and area development project" at Survey no. 141 (part), village: Mundra, Dist. Kutch, by M/s. Adani Mundra SEZ Infrastructure Pvt. Ltd."

Ref : Environment clearance granted to Adani Mundra SEZ Infrastructure Pvt. Ltd. vide letter dated 20th February, 2010 bearing SEIAA letter no. SEIAA/GUJ/EC/8(b)/44 /2010.

Dear Sir,

Please refer to the above cited reference for the said subject matter. In connection to the same, it is to state that copy of the compliance report for the Environmental Clearance for the period of April-2022 to September 2022 is being submitted through soft copy (e-mail communication & CD).

Kindly consider above submission and acknowledge.

Thank you,
Yours Faithfully,
For, **M/s Adani Ports and Special Economic Zone Limited**

Douglas Charles Smith
Chief Executive Officer
Mundra & Tuna Port

Encl: As above

Copy to:

1) The Zonal Officer, Regional Office, CPCB – Western Region, Parivesh Bhawan, Opp. VMC Ward Office No. 10, Subhanpura, Vadodara – 390023.
2) The Member Secretary, GPCB – Head Office, Paryavaran Bhavan, Sector 10 A, Gandhi Nagar – 382010.
3) The Member Secretary, SEIAA, Gujarat, Paryavaran Bhavan, GPCB, Sector 10 A, Gandhi Nagar – 382010.
4) The Regional Officer, Regional Office GPCB (Kutch-East), Gandhidham – 370201.

Adani Ports and Special Economic Zone Ltd
Adani House,
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Mundra, Kutch 370 421
Gujarat, India
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Ports and Logistics

Environmental Clearance Compliance Report

of

Township and Area Development Project, Village: Mundra, Dist. Kutch, Gujarat

of

Adani Mundra SEZ Infrastructure Pvt. Limited

for the period of

April 2022 to September 2022

Index

Compliance Report of Environment Clearance

adani Ports and Logistics	Adani Mundra SEZ Infrastructure Pvt. Ltd., Mundra.	From : Apr'22 To : Sept'22
Status of the conditions stipulated in Environment Clearance		

Half yearly Compliance report for Environment Clearance for the project "Township and area development project at Mundra, Dist. Kachchh, Gujarat of M/s. Adani Mundra SEZ Infrastructure Pvt. Ltd." issued vide letter no. SEIAA/GUJ/EC/8(b)/44/2010 dated 20th February 2010.

Sr. No.	Conditions	Compliance Status as on 30-09-2022
A. Specific Conditions		
A.1	**Construction Phase:**	
1.	Minimum Aerial distance of 100 m shall be kept between processing & non – processing areas of SEZ, as proposed.	Complied during the construction phase. Not applicable at present. This reply covers Condition No. 1 to 27 of Construction Phase. The details of the compliances with respect to construction phase are submitted in Oct'16 to March'17 compliance report. Construction work for the project is partially completed. However, no construction activity carried out during the compliance period of Apr'22 to Sep'22. All the specific conditions provided for construction phase will be considered upon recommencement of construction activity in future.
2.	Height of the buildings in the project shall be restricted to 42 meter (in view of the height restriction specified by the aviation authority) or the height permissible under the bylaws prescribed the SEZ authority, whichever is more stringent. This, however, shall not increase the total population envisaged under the EIA report prepared and submitted to SEAC and SEIAA and shall not increase in the resource consumption like total water usage or wastes generated.	
2(a)	The requirement for fire prevention, line safety in relation to fire and fire protection of the building shall be fulfilled in the project,	

Sr. No.	Conditions	Compliance Status as on 30-09-2022
	as per the National Building Code of India so as to minimize danger to life and property from fire.	
2(b)	All high rise buildings shall have at least two staircases with a condition that the nearest staircases shall be available at every 30 meter from all places in a given building.	
3.	The project proponent shall not obstruct the flow of river Bhukhi passing through the social infrastructure area and shall not do any encroachment on the said river, as per their undertaking dated 21/07/2009. All necessary precautions and measures shall be taken in order to ensure that natural drainage of river Bhukhi passing through the project site is not altered / affected.	Complied during the construction phase. Not applicable at present. The details of the compliances with respect to construction phase are submitted in Oct'16 to March'17 compliance report. Construction work for the project is partially completed. However, no construction activity carried out during the compliance period of Apr'22 to Sep'22. All the specific conditions provided for construction phase will be considered upon recommencement of construction activity in future.
4.	Additional bridge / walkthrough over the Bhukhi river passing through the site shall be provided between the two bridges planned to be provided so as to reduce distance to be travelled during the emergency situations.	
5.	If SEZ authority	

Sr. No.	Conditions	Compliance Status as on 30-09-2022
	permits, adequate parapet / fencing shall be provided along the banks of river Bhukhi passing through the site for preventing fall of animals / humans.	
6.	All required sanitary and hygienic measures shall be provided before starting the construction activities and to be maintained throughout the construction phase.	
7.	The construction site shall be provided with adequately barricades of at least 3 m height on its periphery with adequate signage	
8.	Adequate first aid facilities shall be provided in the project both during construction and operation of the project.	
9.	Adequate drinking water, sanitation and other amenities shall be provided for construction workers at the site. The safe disposal of wastewater and solid wastes generated during the construction phase should be ensured.	Complied during the construction phase. Not applicable at present. The details of the compliances with respect to construction phase are submitted in Oct'16 to March'17 compliance report. Construction work for the project is partially completed. However, no construction activity carried out during the compliance period of Apr'22 to Sep'22.
10.	Provision should be made for the supply of	All the specific conditions provided for construction phase will be considered upon recommencement of construction activity in future.

Sr. No.	Conditions	Compliance Status as on 30-09-2022
	fuel (Kerosene or cooking gas), utensils such as pressure cookers etc. to the laborers during construction phase.	
11.	The project proponent shall ensure that the construction labours are provided with adequate amenities for lighting, drinking water, sanitation etc. to ensure that do not ruin the existing environmental condition.	
12.	Adequate personal protective equipments shall be provided to the construction workers to ensure their safety and the project proponent shall ensure its usage by the labours.	
13.	All topsoil excavated during construction activities should be stored separately for use in horticultural / landscape development within the project site.	
14.	Disposal of debris including the excavated material during construction phase shall not create adverse effect on neighbouring communities and shall be disposed of only at the approved sites with	

Sr. No.	Conditions	Compliance Status as on 30-09-2022
	the approval of the competent authority after taking the necessary precautions for general safety and health aspects.	
15.	Use of diesel generator sets during construction phase should be enclosed type and confirm to EPA rules for air and noise emission standards.	Complied during the construction phase. Not applicable at present. The details of the compliances with respect to construction phase are submitted in Oct'16 to March'17 compliance report. Construction work for the project is partially completed. However, no construction activity carried out during the compliance period of Apr'22 to Sep'22. All the specific conditions provided for construction phase will be considered upon recommencement of construction activity in future.
16.	Ready-made mix concrete should be used so far as possible	
17.	Water demand during construction should be reduced by use of curing agents, plasticizers and other best practices.	
18.	Vehicles hired for bringing construction material at site should be in good conditions and confirm to applicable air and noise emission standards and should be operated only during non-peak hours.	
19.	Ambient noise levels shall conform to residential standards both during day and night. Incremental pollution load on the ambient air and noise quality should be closely monitored during construction	

Sr. No.	Conditions	Compliance Status as on 30-09-2022
	phase.	Complied during the construction phase. Not applicable at present. The details of the compliances with respect to construction phase are submitted in Oct'16 to March'17 compliance report. Construction work for the project is partially completed. However, no construction activity carried out during the compliance period of Apr'22 to Sep'22. All the specific conditions provided for construction phase will be considered upon recommencement of construction activity in future.
20.	Fixtures for showers, toilet, flushing and drinking should be of low flow either by use of aerator or pressure reducing devices or sensor based control.	
21.	Fly ash should be used as building material in the construction as per provision of Fly Ash Notification under EPA.	
22.	Structural design aspects in accordance to the seismic zone shall be strictly adhered to.	
23.	No ground water shall be used and the water required during construction phase shall be sourced from Gujarat Water Infrastructure Ltd.	
24.	The construction materials and debris shall be properly stored and handled to avoid negative impacts such as air pollution and public nuisances by blocking the roads and public passages. Appropriate barricading shall be done and signboards shall be put at such site.	
25.	Ambient Air Quality Monitoring / Noise monitoring shall be carried out during the construction. The	

Sr. No.	Conditions	Compliance Status as on 30-09-2022
	location of ambient air quality monitoring stations and its frequency shall be decided in consultation with GPCB.	
26.	The provisions of the buildings and other construction workers rules shall be met with by the project proponent in addition to other statutory requirements under different environmental pollution control and safety related acts and rules.	
27.	Environment Management Cell shall be formed, which will supervise and monitor the environment related aspects of the project during construction and operational phases in addition to observance of Gujarat Building and other constructions workers act and rules including registration of the project under this act.	
A.2	**Operation Phase:**	
28.	Fresh water requirement during the operation phase shall not exceed 9 MLD and it shall be sourced from Gujarat Water Infrastructure Ltd. Metering of the water	Complied. No ground water is being extracted. Fresh water requirement for Samudra township and Adani Hospital is approximately average 1093 KLD during compliance period which has been sourced through Gujarat Water Infrastructure Ltd. (GWIL) and APSEZ desalination plant.

Sr. No.	Conditions	Compliance Status as on 30-09-2022
	shall be done and its records shall be maintained. No ground water shall be extracted.	No ground water is being extracted. Record maintained for quantity of water usage during the period Apr'22 to Sep'22 is attached as **Annexure – 1.**
29.	The total sewage generation from the proposed social infrastructure project shall not exceed 7.2 MLD.	Complied. During compliance period Apr'22 to Sep'22 average quantity of sewage generation was **894.1 KLD** from Samudra township, Adani Hospital & Mundra Village. Average quantity of treated sewage discharge was **676 KLD** during compliance period. Generated sewage is being treated in STP of Samudra Township and treated water is being utilized for horticultural purpose within AMSIPL premises. AMSIPL has been granted Consent to Operate from Gujarat Pollution Control Board for receiving 1.0 MLD of domestic sewage from Mundra village for treatment in Samudra township STP and final disposal on land for horticulture purpose within AMSIPL as well as APSEZ premises. Details of the same were submitted along with half yearly compliance report for the period Apr'20 to Sep'20. During compliance period Apr'22 to Sep'22 an average **65.67 KLD** of domestic sewage received from Mundra village to Samudra township STP for treatment. Details of sewage generated from township, received from Adani hospital & Mundra village and treated water discharge during the period Apr'22 to Sep'22 is attached as **Annexure – 1.**
30.	The project proponent shall install and operate adequate sewage treatment plants (STP) comprising of 3 modules of STP (each of 2.5 MLD) to achieve ultimate capacity of 7.5 MLD, for treatment of sewage. These STP modules shall be operated regularly and effectively to achieve	Complied. STP having capacity of 2.5 MLD with advance MBR technology is constructed and operated in township area. Treated sewage is being utilized for horticulture purposes after achieving discharge norms of GPCB. We have dismantled the Adani Hospital STP having 30 KLD capacity and the domestic sewage generated from hospital is being discharged in to STP of Samudra Township through underground pipeline for treatment and disposal. Consent to Operate for the same has been granted from Gujarat Pollution Control Board. Details of the same were submitted along with half yearly compliance report for the period Apr'20 to Sep'20.

<table>
<tr><th>Sr. No.</th><th>Conditions</th><th>Compliance Status as on 30-09-2022</th></tr>
<tr><td></td><td>the GPCB norms.</td><td>
Pre-treatment facility i.e. Disinfection treatment is being provided for domestic sewage at hospital before discharging in to Samudra Township STP. During compliance period Apr'22 to Sep'22 avg. 14.19 KLD domestic sewage received from hospital for treatment.

Third party analysis of the treated water is being carried out twice in a month by NABL and MoEF&CC accredited agency namely M/s. Unistar Environment and Research Labs Pvt. Ltd., Vapi. Summary of the same for duration from Apr'22 to Sep'22 is mentioned below.

Locations: STP (Township)
<table>
<tr><th>Parameters</th><th>Unit</th><th>Min</th><th>Max</th><th>Average</th><th>Perm. Limit$</th></tr>
<tr><td>pH</td><td>--</td><td>7</td><td>7.52</td><td>7.31</td><td>6.5 – 9.0</td></tr>
<tr><td>TSS</td><td>mg/L</td><td>16</td><td>28</td><td>22.83</td><td>100</td></tr>
<tr><td>BOD (3 Days @ 27 °C)</td><td>mg/L</td><td>14</td><td>20</td><td>17.08</td><td>30</td></tr>
<tr><td>Fecal Coliform</td><td>MPN/ 100 ml</td><td>34</td><td>90</td><td>60.33</td><td>< 1000</td></tr>
<tr><td>Residual Chlorine</td><td>mg/L</td><td>0.65</td><td>0.96</td><td>0.75</td><td>--</td></tr>
</table>
$ as per CC&A granted by GPCB

Please refer Annexure – 2 for detailed analysis reports. Approx. INR 6.37 Lakh is spent for all environmental monitoring activities during FY 2022 - 2023 (upto Sep'22) for overall APSEZ, Mundra.
GPCB is also doing sampling and analysis of treated water during their routine visit.
</td></tr>
</table>

<table>
<tr><th>Sr. No.</th><th>Conditions</th><th>Compliance Status as on 30-09-2022</th></tr>
<tr><td>31.</td><td>Two modules of STP of 2.5 MLD (i.e. total 5 MLD) shall be installed on one side of the Bhukhi River and one module of STP of 2.5 MLD shall be installed on the other side of the Bhukhi River passing through the social infrastructure project. Hence no any cross drainage civil work shall be carried out.</td><td>Complied.

At present one STP of 2.5 MLD is installed on one side of Bhukhi river for Samudra Township.

Below underground pipeline network has been laid for receiving sewage from Mundra town and Adani hospital for treatment as well as treated water discharge to Adani hospital for horticulture purpose with requisite permissions from GPCB.
<table>
<tr><th>Sr. No.</th><th>Pipeline Connectivity</th><th>Purpose</th><th>Length</th><th>Dia.</th><th>Make</th></tr>
<tr><td>1</td><td>Mundra Village to Samudra Township Existing Sewage Collection Tank</td><td>For treatment of 1 MLD Domestic sewage</td><td>4.2 Km</td><td>315 mm</td><td>HDPE</td></tr>
<tr><td>2</td><td>Adani Hospital to Existing Mundra Village – Samudra Township Collection tank pipeline</td><td>For treatment of 25 KLD Domestic sewage</td><td>323 mtr</td><td>90mm</td><td>HDPE</td></tr>
<tr><td>3</td><td>Samudra Township treated water tank to Adani hospital 40m^3 tank</td><td>For utilization of treated water @ 150 KLD for gardening purpose</td><td>1.56 Km</td><td>90mm</td><td>HDPE</td></tr>
</table></td></tr>
<tr><td>32.</td><td>Out of total 7.2 MLD of treated sewage conforming the GPCB norms, 2 MLD treated sewage shall be utilized within the project area for plantation / gardening whereas balance 5.2 MLD of treated sewage shall be utilized in the identified area of MPSEZL for plantation</td><td>Complied.

During Apr'22 to Sep'22 Avg. 676 KLD of treated water was used for gardening / plantation purpose within Township area / Hospital area / APSEZ area.</td></tr>
</table>

Sr. No.	Conditions	Compliance Status as on 30-09-2022
	/ gardening.	
33.	In no case, the wastewater / treated sewage shall be discharged into the river Bhukhi passing through the social infrastructure project.	Complied During Apr'22 to Sep'22 avg. 676 KLD of treated water from STP was used for gardening / plantation purpose within township area, hospital area and other APSEZ area. Hence in no case, the wastewater / treated sewage is discharged into the river Bhukhi passing through the social infrastructure project.
34.	Best available technology shall be used for disinfection of treated sewage before reuse / discharge.	Complied. Chlorination treatment is provided for disinfection before reuse / discharge.
35.	Rain water harvesting of roof top run off of the building to be constructed as a part of social infrastructure as per the plan submitted shall be implemented. Before recharging the rain water, pre-treatment must be done to remove suspended matter.	Complied. Location of rain water harvesting was earmarked at one of location in identified SEZ area based on direction of flow of storm water channel. However underground water is saline in nature due to sea water ingress and harvested water is likely to get contaminated in high tide. The project will be taken up upon finding out the solution for rain water harvesting within project boundary. However, APSEZ has carried out rainwater harvesting activities in the nearby villages for benefit of the locals. Water conservation Projects i.e. Roof Top Rain Water Harvesting, Desilting of Check dams, Bore Well Recharge and Pond deepening were taken up in past years, review and monitoring of all water harvesting structures had been taken up. Including this a big recharge operation by bunding was taken up for Zarpara village. To make connections between human actions and the level of biological diversity found within a habitat and/or ecosystem, this year Adani Foundation launch project "Sanrakshan" in coordination with GUIDE and Sahjeevan. Since 10 years considerable Water Conservation Work carried out in Mundra Taluka. Due to satisfactory rain in current year 1.11 mtr ground water table increased as per increased in

Sr. No.	Conditions	Compliance Status as on 30-09-2022
		coastal belt of Mundra as per Government Figures. **Our water conservation work is as below.** • Large number of water harvesting structure (18 Nos. of check dams in coordination with salinity department) and Augmentation of 3 check dams • Ground recharge activities (pond deepening work for more than 56 ponds) individually and 26 ponds under Sujlam Suflam Jal Abhiyan were built leading to a significant increase in water table and higher returns to the farmers. • Roof Top Rain Water Harvesting 145 Nos. (40 Nos. current FY 2022-23) which is having 10,000 litre storage which is sufficient for one year drinking water purpose for 5 people family. • Recharge Borewell 201 Nos (12 Nos. current FY 2022-23) which is best ever option to. • Drip Irrigation approx. 1156 Farmers benefitted in coordination with Gujrat Green Revolution Company till date. • Bund construction on way of Nagmati River could save more than 575 MCFT water quantity which recharged in ground due to which borewell depth decreased by 50-100 Ft in Zarpara, Bhujpur and Navinal Vadi Vistar. • Pond Pipe line work at Prasla Vistar Zarpara which increase recharge capacity more than 25% in 100 hector area. • Check dam gate valve construction at Bhujpur which controlled more than 350 MCFT water to go into sea and get recharged current year. • Luni Pond Bund Repairing Work is completed. With the objective of to preserve the rainwater to reduce the impact of salinity and recharge the ground water (the main source of water) to facilitate the Agricultural activities as well as for drinking water. Please refer **Annexure – 3** for full details of CSR activities carried out by Adani Foundation in the Mundra region. Budget for CSR Activity for the FY 2022-23 is to the tune of INR 1317.36 lakh. Out of which, Approx. INR 495.65 lakh are spent during the current compliance period Apr'22 to Sep'22.
36.	The Municipal Solid Waste (MSW) shall be properly collected and segregated at source and it shall be disposed as per the guidelines of	Complied. A well-established system for Municipal Solid Waste (MSW) management is in place. Municipal solid waste collection from AMSIPL area is being

Sr. No.	Conditions	Compliance Status as on 30-09-2022
	the MSW Rules 2000, as may be amended time to time. The dried biomass from the STP will be used as manure in gardening / plantation.	done on daily bases. Collected dry waste is being transported to APSEZ Material Recovery Facility (MRF) where it is being sorted out in different streams e.g. paper/plastic/cardboard/glass/metal. These sorted wastes are further transported for recycling, whereas remaining non-recyclable waste is bailed and sent to cement plant (M/s. Ambuja Cement Ltd., Kodinar) for Co-processing as RDF (Refused Derived Fuel). Food / Organic Waste generated from AMSIPL premises is being diverted to Organic Waste Converter and Bio gas plant installed within APSEZ premises for converting food / organic waste in to manure and / or biogas. Generated manure is being utilized by horticulture department in green belt area and biogas is being utilized in kitchen area for cooking food. Total 431.96 MT organic / food waste generated from entire APSEZ, Mundra was processed for converting in to reach manure and bio gas during the compliance period i.e. Apr'22 to Sep'22 and utilized within APSEZ area. Dry waste collection drive including plastic free drive and waste segregation drive is being organised on regularly basis.
37.	The Bio-medical Waste (BMW) shall be disposed as per guidelines of BMW rules 1998 as may be amended from time to time.	Complied. Multispecialty hospital has taken the necessary approvals from GPCB for the disposal of Bio Medical Waste. Total 3992 kg of bio medical waste was disposed from Adani hospital to Common Bio Medical Waste Treatment facility of M/s Distormed Kutch Services Pvt. Ltd., Bhuj during the compliance period i.e. Apr'22 to Sep'22 at the frequency of once in two days. Logbook showing the record of Bio-medical Waste collection for the month Sep'22 is attached as **Annexure – 4.** Multispecialty hospital has taken the taken the BMW Authorization from the GPCB. The copy of BMW Authorization is attached as **Annexure – 5**.
38.	Hazardous wastes, if any generated during the operation phase shall be handled as per the Hazardous Waste (Management, Handling &	Point Noted. No hazardous waste was generated during the compliance period of Apr'22 to Sep'22. If any hazardous waste generation in future, it will be disposed through authorised agency only as per Hazardous Waste Rules

Sr. No.	Conditions	Compliance Status as on 30-09-2022
	Transboundary Movement) Rules 2008, as may be amended from time to time.	– 2016. M/s. Adani Mundra Sez Infrastructure Pvt. Ltd, (AMSIPL) has been granted the CC&A-Renewa by GPCBI vide Consent No. AWH-121264 Valid upto: 02/09/2027 on dated 06/09/2022. The copy of CCA – Renewal order is attached as **Annexure –6.**
39.	54,600 sq.m. area shall be earmarked for the parking purpose as proposed. The area earmarked for the parking shall be used for parking only. No other activity shall be permitted in this area.	Complied. Construction work for the project is partially completed. Entire parking area is earmarked for parking as per National Building Code requirement within township premises. This parking is used for said purpose only.
40.	Necessary signage including continuous display of status of parking availability at entry, exit and all other appropriate places shall be provided which should have appropriate size of letters and shall be visible from the at least 50 meter distance from the adjacent road.	Complied. Parking area is earmarked as per National Building Code requirement. Trained security guards are deputed round the clock to guide/help for entry, exit and parking. Continuous display regarding status of parking availability will be installed once project is in full-fledged operation.
41.	No public space shall be used or blocked for the parking and the trained staff shall be deployed to guide the visitors for parking and helping the senior citizens and physically challenged people	Complied. Adequate parking area has been provided as per National Building Code. Trained security guards are available round the clock to guide/help for entry, exit and parking to senior citizens and physically challenged people.

Sr. No.	Conditions	Compliance Status as on 30-09-2022
42.	Traffic congestion near the entry and exit points from the roads adjoining the proposed project site must be avoided.	Complied. Separate entry and exits have been provided at main gate with architectural divider for proper traffic management. Appropriate arrangements are made for emergency situations.
43.	Common utilities like drinking water facility, toilets etc shall be provided on each floor with adequate signage thereof. Adequate distance shall be maintained between the drinking water and toilet blocks.	Complied. Common utilities like drinking water facility, toilets etc. are provided at Adani Hospital and commercial building with adequate distance between drinking water & toilet facilities.
44.	The green belt shall be developed in 50 Hectares area in terms of peripheral green belt around the project site, road side plantation and green belt on either side of the Bhukhi river. The project proponent shall plant at least 20,000 trees in green belt, as proposed. The open spaces inside the social infrastructure project shall be suitably landscape and covered with vegetation of indigenous variety.	Complied. AMSIPL has developed 57.27 ha area as green belt with plantation of 75,556 saplings in AMSIPL premises. The open spaces inside the social infrastructure project are suitably landscaped and covered with green lawn and other vegetation. So, far APSEZ has developed 486.19 ha. area as greenbelt with plantation more than 9.5 Lacs saplings within the APSEZ area. Details of the green belt development activity done by APSEZL, Mundra are attached as **Annexure – 7.**
45.	The area earmarked as green area shall be used only for green belt and shall not be altered for any other purpose. The fund earmarked for green belt development shall not be diverted	Complied. The area earmarked as green area is used only for green belt and not altered for any other purpose. Separate budget for the horticulture department is earmarked every year. The spent budget of Horticulture Department for the period of

Sr. No.	Conditions	Compliance Status as on 30-09-2022
	for any other purpose.	financial year 2022-23 is INR 913 lacs. Out of which, Approx. INR 490 lakh are spent during the current compliance period Apr'22 to Sep'22. Details upon green belt development are provided in condition no. 44 above.
46.	The project proponent shall explore the application of solar energy and shall be incorporated for the illumination of common areas, lighting of internal roads and passages in addition to solar water heating, if any.	Complied. Solar power system of **1.5 MW** at roof top of residential blocks of Samudra Township and **69 KW** at Adani Hospital has been installed and commissioned. Information has been already submitted to MoEF&CC along with Half Yearly Compliance Report Apr'16 to Sep'16. Total **1156 MWH** of solar power generated and supplied to the grid energy during compliance period i.e. Apr'22 to Sep'22.
47.	The acoustic enclosures shall be installed at all noise generating equipments and the noise level shall be maintained as per the MoEF / CPCB guidelines / norms both during day and night time.	Complied. D.G. Sets having acoustic enclosures are provided as stand-by and used in case of main power failure only. However, regular noise monitoring is being carried out. Noise (once in a month) monitoring is being carried out by NABL and MoEF&CC accredited agency namely M/s. Unistar Environment and Research Labs Pvt. Ltd., Vapi. Summary of the same for duration of Apr'22 to Sep'22 is mentioned below. **Total Sampling Locations & Frequency: 2 Nos. (Monthly)** **Noise** | **Unit** | **Leq Min** | **Leq Max** | **Leq Average** | **Leq Perm. Limit$** Day Time | dB(A) | 56.8 | 69.8 | 63.67 | 75 Night Time | dB(A) | 51.23 | 64.2 | 58.03 | 70 $ as per CC&A granted by GPCB Please refer **Annexure – 2** for detailed analysis reports. Approx. INR 6.37 Lakh is spent for all environmental monitoring activities during FY 2022 - 2023 (upto Sep'22) for overall APSEZ, Mundra.
48.	The project proponent shall install the electric appliances, which are	Complied. Energy Conservation through Installation of Motion Sensor

Sr. No.	Conditions	Compliance Status as on 30-09-2022
	energy efficient and meeting with the Bureau of Energy Efficiency norms, wherever applicable.	(Occu switch) & AC Temp. Controls in buildings are provided. AMSIPL has installed the electric appliances which meets the Energy Efficiency norms.
49.	The energy audit shall be conducted at regular interval for the project and the recommendations of the audit report shall be implemented with spirit.	Complied. Energy audit is being carried on regular basis Last audit has been carried out from 18th to 20th January' 2022 by M/s. ECO ENERGY SOLUTION. Energy audit report for Samudra Township is attached as **Annexure-8.**
50.	The roof should meet regulatory requirement as per Energy Conservation Building Code by using appropriate thermal insulation material to fulfil requirements.	Complied. Energy Conservation Building Code is considered during the development of buildings.
51.	Use of glass shall be minimal to reduce the electricity consumption and load on air-conditioning.	Complied. Minimal glass is used in air conditioning areas to reduce electricity consumption and load on air-conditioning.
52.	Risk estimation shall be carried out for the project and disaster management plan shall be prepared and its recommendations shall be implemented in the time bound manner.	Complied. Emergency Response Plan was prepared by Trivedi & Associates Technical Services Pvt. Ltd in August, 2015 for AMSIPL which included risk estimation for medical emergency, fire emergency, natural calamities. Detail is submitted to the MoEF & CC along with half yearly compliance report for the period from Apr – 2015 to Sep – 2015. Various plans as fire service plan, communication plan, mutual aid plan, and evacuation plan are implemented to combat with emergency situations.
53.	The raw water sumps will be equipped with suction differential	Complied. 250 KL of fire water is reserved with fire hydrant system for

Sr. No.	Conditions	Compliance Status as on 30-09-2022
	head / partition so as to insure that minimum 500 KL water shall remain reserved as fire water as proposed.	Adani hospital. Approximately 400 KL water is available in 6 different water tanks at various sectors of Samudra Township. In total, more than 500 KL water is reserved as fire water at AMSIPL.
54.	Necessary emergency lighting system along with emergency power back up system shall be provided. In addition, emergency public address system arrangement and signage for emergency exit route shall be provided on each floor.	Complied. Power is supplied through M/s MPSEZ Utilities Limited to the project site. Power failure is the rarest situation in the area and in case of such emergency, there is provision of 125 KVA D.G. set at Samudra Township and 500 KVA D.G. set at Adani Hospital. Public address system is available with the security staff in the vicinity. Emergency contact is display each block as below Security control: 8980048877 Township Security control: 8980015046 Medical Adani hospital reception: 2838-619555 Medical Emergency Number -: 2838-619667 Medical Emergency mobile Number: 7574848413 Fire control room-: 2838-255801 Fire control room mob.: 9879114996
55.	Necessary auto glow, signage at all appropriate places shall be provided to guide the people towards exits and assembly points during the unforeseen emergency and eventuality conditions.	Complied. Auto glow signage is provided at adequate locations to provide guidance to the people towards exits. Also the township & Adani Hospital is under security guard surveillance to combat with unforeseen emergency conditions. Photograph showing the auto glow signages were submitted along with compliance report submission for the duration of Oct'16 to Mar'17. Photographs showing the emergency signages were submitted along with EC Compliance report for the period Apr'19 to Sep'19.
56.	Training to the staff for the First Aid and Fire Fighting Alarm with regular mock drill shall be conducted regularly	Complied. For first aid situations a First Aid centre is provided at Samudra Township. Multispecialty Hospital is part of the project activity which can be utilised for medical emergencies.

Sr. No.	Conditions	Compliance Status as on 30-09-2022
	and shall be made in integral part of the disaster management plan of the project.	Regular mock drill and fire training is also being conducted at project site. Home fire safety awareness and firefighting training was conducted in township on April 2022 and total 457 residents participated in the same. Please refer **Annexure – 9** for fire training and awareness details.
57.	Ozone Depleting Substance (Regulation and Control) rules shall be followed while designing the air conditioning system of the project.	Complied. Ozone Depleting Substance inventory was produced and is maintained during the compliance period of Oct'18 to Mar'19. New gas being used in refilling of ACs is ozone friendly in nature.
58.	Environment Management Cell shall be formed by the project proponent during operation phase which will supervise and monitor the environment related aspects of the project including incremental pollution loads on the ambient air quality, noise and water quality periodically till the management of the project remains with the project proponent.	Complied. APSEZL has a well-structured Environment Management Cell, staffed with qualified manpower for implementation of the Environment Management Plan at site. Site team report to Sr. Manager (Environment) at Corporate, who heads the Environment Management Cell who directly reports to the top management. Environment Management Cell Organogram were submitted as part of compliance report submission for the duration of Apr'21 to Sep'21. And there is no further change. Ambient Air Quality (twice in a week) and Noise (once in a month) monitoring are being carried out by NABL and MoEF&CC accredited agency namely M/s. Unistar Environment and Research Labs Pvt. Ltd., Vapi. Summary of the same for duration from Apr'22 to Sep'22 is mentioned below. **Total Sampling Locations & Frequency: 2 Nos.**

Parameter	Unit	Min	Max	Average	Perm. Limit$
	AAQM				
PM_{10}	$\mu g/m^3$	15.23	89.49	68.89	100
$PM_{2.5}$	$\mu g/m^3$	5.67	37.25	24.19	60
SO_2	$\mu g/m^3$	4.1	23.87	12.47	80
NO_2	$\mu g/m^3$	7.12	31.06	18.44	80
Noise	**Unit**	**Leq Min**	**Leq Max**	**Leq Average**	**Leq Perm. Limit***

Sr. No.	Conditions	Compliance Status as on 30-09-2022
		<table><tr><td>Day Time</td><td>dB(A)</td><td>56.8</td><td>69.8</td><td>63.67</td><td>75</td></tr><tr><td>Night Time</td><td>dB(A)</td><td>51.23</td><td>64.2</td><td>58.03</td><td>70</td></tr></table> $ as per NAAQ standards, 2009 * as per CC&A granted by GPCB Please refer **Annexure – 2** for detailed analysis reports. Approx. INR 6.37 Lakh is spent for all environmental monitoring activities during FY 2022 – 2023 upto Sept'22 for overall APSEZ, Mundra.
B. General Conditions		
59.	The project proponent shall permit the outside people to use the social infrastructures like hospital, schools, colleges etc. coming up in the proposed project, as per their undertaking dated 21/07/2009.	Complied. Outside people are allowed to use the social infrastructures like hospital and school. Total 1093 patients including OPD (Outpatient Department) as well IPD (In-Patient Department) from nearby villages were treated in the Hospital during this compliance period. Approx. INR 9.61 Lakh worth of free medical services given to nearby villagers during the compliance period Apr'22 to Sep'22.
60.	Various provisions of the Environment (Protection) Act, 1986 and the Rules / Notifications issued there under by the Ministry of Environment and Forest, Govt. of India, from time to time shall be strictly complied with.	Point noted.
61.	No further expansion or modification in the plant shall be carried out without prior approval of the MoEF/SEIAA as the case may be. In case of deviations or alterations in the	Point noted.

Sr. No.	Conditions	Compliance Status as on 30-09-2022
	project proposal from those submitted to MoEF / SEIAA / SEAC for clearance, a fresh reference shall be made to the SEIAA / SEAC to assess the adequacy of conditions imposed and to add additional environmental protection measures required, if any.	
62.	The project authorities shall earmark adequate funds to implement the conditions stipulated by SEIAA as well as GPCB along with the implementation schedule for all the conditions stipulated herein. The funds so provided shall not be diverted for any other purpose.	Complied. Separate budget for the Environment cell is earmarked every year. All environmental and horticulture activities are considered at group level and budget allocation is also done accordingly. Budget for environmental management measures (including horticulture) for the FY 2022-23 is to the tune of INR 1414.23 lakh. Out of which, Approx. INR 757.85 lakh are spent during the year FY 2022-23 till Sep'22. Detailed breakup of the expenditures for the past 3 years is attached as **Annexure – 10**.
63.	The applicant shall inform the public that the project has been accorded Environmental Clearance by the SEIAA and i.e. copies of the clearance letter are available with the GPCB and may also be seen at the website of SEIAA / SEAC / GPCB. This shall be advertised within seven days from the date of the clearance letter, in at least two local	Already complied. Not applicable at present. The advertisement was circulated in Gujarati language through local newspaper – Kutchh Mitra as well as in English language through local newspaper – Indian Express on the date of 10.03.2010. Information has been already submitted to MoEF & CC along with half yearly compliance report April – 2015 to Sep – 2015.

<table>
<tr><th>Sr. No.</th><th>Conditions</th><th>Compliance Status as on 30-09-2022</th></tr>
<tr><td></td><td>newspaper that are widely circulated in the region, one of which shall be in the Gujarati language and the other in English. A copy each of the same shall be forwarded to the concerned regional office of the Ministry.</td><td></td></tr>
<tr><td>64.</td><td>It shall be mandatory for the project management to submit half yearly compliance report in respect of the stipulated prior Environmental Clearance terms and conditions in hard and soft copies to the regulatory authority concerned, on 1st June and 1st December of each calendar year.</td><td>Complied.

Compliance report of EC conditions is uploaded regularly. Last compliance report including results of monitoring data for the period of Oct'21 to Mar'22 was submitted to Integrated Regional Office (IRO) @ Gandhinagar, Zonal Office of CPCB @ Baroda, GPCB @ Gandhinagar & Gandhidham and SEIAA, Gandhinagar vide our letter dated 27.05.2022. Copy of the same is also available on our web site https://www.adaniports.com /ports-downloads. A soft copy of the same was also submitted through e-mail on 30.05.2022 to all the concern authorities. Please refer below for the details regarding past six compliance submissions.

<table>
<tr><th>Sr. No.</th><th>Compliance period</th><th>Date of submission</th></tr>
<tr><td>1</td><td>Apr'19 to Sep'19</td><td>28.11.2019</td></tr>
<tr><td>2</td><td>Oct'19 to Mar'20</td><td>20.05.2020</td></tr>
<tr><td>3</td><td>Apr'20 to Sep'20</td><td>26.11.2020</td></tr>
<tr><td>4</td><td>Oct'20 to Mar'21</td><td>25.05.2021</td></tr>
<tr><td>5</td><td>Apr'21 to Sep'21</td><td>30.11.2021</td></tr>
<tr><td>6</td><td>Oct'21 to Mar'22</td><td>30.05.2022</td></tr>
</table>
</td></tr>
<tr><td>65.</td><td>The project authorities shall also adhere to the stipulations made by the Gujarat Pollution Control Board.</td><td>Point noted.</td></tr>
<tr><td>66.</td><td>The project authorities shall inform the GPCB, regional office of MoEF and SEIAA about the date of financial closure and final</td><td>Complied</td></tr>
</table>

Sr. No.	Conditions	Compliance Status as on 30-09-2022
	approval of the project by the concerned authorities and the date of start of the project.	
67.	The SEIAA may revoke or suspend the clearance, if implementation of any of the above conditions is not found satisfactory.	Point noted.
68.	The company in a time bound manner shall implement these conditions. The SEIAA reserves the right to stipulate additional conditions, if the same is found necessary. The above conditions will be enforced inter-alia under the provisions of the water (Prevention and Control of Pollution) Act, 1974, Air (Prevention and Control of Pollution) Act, 1981, the environment (Protection) Act, 1986, Hazardous Wastes (Management and Handling) Rules 2003 and the Public Liability Insurance Act, 1991 along with their amendments and rules.	Complied. The company has implemented the provided conditions and the compliance report is being submitted regularly. Please refer Condition No. 64 for further details.
69.	This environmental clearance is valid for five years from the date of issue.	Point noted.
	Additional condition – (amendment to Environment Clearance Order No.	

Status of the conditions stipulated in Environment Clearance

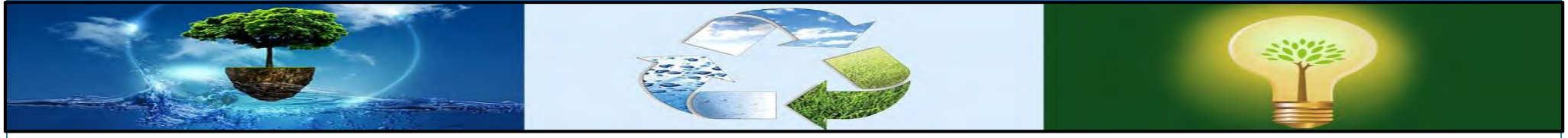
Sr. No.	Conditions	Compliance Status as on 30-09-2022
	SEIAA/GUJ/EC/8(b)/44/2010 dated 20 February 2010	
--	The applicant shall carry out comparative carbon footprint study of low rise building with large ground coverage v/s high rise building with low ground coverage through reputed institute like CEPT or GIDR and submitted to SEIAA within one year from the issuance of EC.	Complied. Comparative carbon footprint study report submitted to the MoEF & CC along with half yearly compliance report Oct – 2014 to March – 2015.

Annexure – 1

Water Consumption and Wastewater Generation Details for AMSIPL (Apr'22 to Sept'22)			
Month	**Water Consumption (Samudra Township + Adani Hospital), KL**	**Total STP Inlet Water (Samudra Township + Adani Hospital+ Mundra Town), KL**	**Total STP Outlet Water, KL**
Apr-22	33493	29887	24427
May-22	32263	25181	21818
Jun-22	36587	31740	24357
Jul-22	33365	21742	15913
Aug-22	31114	25913	19982
Sep-22	33215	29157	17240
Total	**200037**	**163620**	**123737**
Avg. Per Day	**1093.10**	**894.10**	**676.16**

Sewage Received at Samudra Township STP (Apr'22 to Sept'22)			
Month	**Samudra Township, KL**	**Adani Hospital, KL**	**Mundra Town, KL**
Apr-22	25513	251	4123
May-22	22397	199	2585
Jun-22	26327	341	5072
Jul-22	20770	734	238
Aug-22	25307	606	0
Sep-22	28691	466	0
Total	**149005**	**2597**	**12018**
Avg. Per Day	**814.23**	**14.19**	**65.67**

Annexure – 2



"Half Yearly Environmental Monitoring Reports "

For,

adani
Ports and Logistics

M/S. ADANI MUNDRA SEZ INFRASTUCTURE PVT. LTD. (AMSIPL)

PLOT NO/Survey No. 141 (Part), Village – Mundra, Tal.: Mundra, Dist. – Kutch.

Monitoring Period: April – 2022 to September - 2022

Submitted By

UniStar
Environment and Research Labs Pvt. Ltd.

UniStar Environment & Research Labs Pvt. Ltd.

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RESULTS OF STP OUTLET WATER

SR.NO.	TEST PARAMETERS	UNIT	SAMUNDRA TOWNSHIP STP OUTLET						GPCB Permissible Limit	TEST METHOD
			Apr-22		May-22		Jun-22			
			12-04-2022	25-04-2022	10-05-2022	30-05-2022	15-06-2022	28-06-2022		
1	pH @ 25 ° C	--	7.48	7.52	7.36	7.29	7.28	7.34	6.5 to 9	APHA 23rd Ed.,2017,4500-H^+B
2	Total Suspended Solids	mg/L	26	22	24	20	22	16	100	APHA 23rd Ed.,2017,2540 -D
3	Biochemical Oxygen Demand (BOD) (5 days at 20 ° C)	mg/L	14	16	18	16	15	17	30	APHA 23rd Ed,2017,5210-B 5-6
4	Residual chlorine	mg/L	0.7	0.8	0.96	0.77	0.87	0.69	0.5 Min.	APHA 23rd Ed.,2017,4500-Cl-B
5	Fecal Coliform	MPN Index/100ml	90	80	80	50	60	50	1000	IS 1622: 1981

Continue…

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RESULTS OF STP OUTLET WATER

SR.NO.	TEST PARAMETERS	UNIT	SAMUNDRA TOWNSHIP STP OUTLET						GPCB Permissible Limit	TEST METHOD
			Jul-22		Aug-22		Sep-22			
			15-07-2022	21-07-2022	06-08-2022	26-08-2022	15-09-2022	27-09-2022		
1	pH @ 25 ° C	--	7	7.24	7.18	7.25	7.38	7.41	6.5 to 9	APHA 23rd Ed.,2017,4500-H^+B
2	Total Suspended Solids	mg/L	20	28	24	22	24	26	100	APHA 23rd Ed.,2017,2540 -D
3	Biochemical Oxygen Demand (BOD) (5 days at 20 ° C)	mg/L	15	18	18	19	20	19	30	APHA 23rd Ed,2017,5210-B 5-6
4	Residual chlorine	mg/L	0.72	0.65	0.72	0.68	0.72	0.75	0.5 Min.	APHA 23rd Ed.,2017,4500-Cl-B
5	Fecal Coliform	MPN Index/100ml	50	80	34	60	50	40	1000	IS 1622: 1981

Mr. Nilesh Patel
Sr. Chemist

UNISTAR ENVIRONMENT & RESEARCH LABS PVT. LTD. GUJARAT VAPI.

Mr. Nitin Tandel
Technical Manager

Results of Ambient Air Quality Monitoring

Name of Location		SAMUDRA TOWNSHIP – STP				
Sr. No.	Date of Monitoring	Parameter with Results				
		PM_{10} µg/m³	$PM_{2.5}$ µg/m³	SO_2 µg/m³	NO_2 µg/m³	CO mg/m³
1.	07-04-2022	72.6	21.45	9.12	16.78	NOT DETECTED
2.	08-04-2022	82.5	27.33	12.34	20.23	--
3.	11-04-2022	79.45	23.69	12.23	18.31	--
4.	12-04-2022	67.23	18.45	13.56	19.54	--
5.	18-04-2022	75.67	21.36	12.16	16.75	--
6.	21-04-2022	80.32	29.34	15.23	21.44	--
7.	25-04-2022	84.34	33.28	12.34	18.34	--
8.	28-04-2022	78.91	30.25	11.25	17.44	--
9.	02-05-2022	81.34	28.94	11.56	17.89	--
10.	05-05-2022	75.44	21.17	14.51	21.45	--
11.	09-05-2022	83.23	26.54	10.35	14.56	--
12.	12-05-2022	71.78	20.65	12.89	18.23	--
13.	16-05-2022	64.55	17.89	14.53	20.45	--
14.	18-05-2022	70.2	22.56	11.56	16.53	--
15.	23-05-2022	78.25	25	10.21	21.55	--
16.	26-05-2022	83.45	31.57	9.45	20.67	--

Continue…

Name of Location		SAMUDRA TOWNSHIP – STP				
Sr. No.	Date of Monitoring	Parameter with Results				
		PM_{10} µg/m³	$PM_{2.5}$ µg/m³	SO_2 µg/m³	NO_2 µg/m³	CO mg/m³
17.	30-05-2022	75.16	23.54	10.56	15.83	--
18.	02-06-2022	76.25	21.45	12.34	19.45	--
19.	06-06-2022	80.2	26.78	11.68	15.68	--
20.	09-06-2022	68.15	20.44	9.33	15.68	--
21.	13-06-2022	67.42	22.51	12.37	19.25	--
22.	15-06-2022	80.21	27.89	10.28	17.84	--
23.	20-06-2022	72.46	22.34	14.38	21.45	--
24.	23-06-2022	80.55	28.95	11.25	18.79	--
25.	27-06-2022	62.39	21.54	8.56	15.44	--
26.	29-06-2022	72.46	25.68	13.89	19.32	--
27.	04-07-2022	45.23	13.46	8.12	11.25	NOT DETECTED
28.	07-07-2022	21.34	8.43	4.56	7.23	--
29.	11-07-2022	15.23	6.15	4.23	7.89	--
30.	14-07-2022	22.36	9.45	7.12	9.17	--
31.	18-07-2022	30.12	11.34	5.23	7.12	--
32.	21-07-2022	40.23	15.34	8.2	10.23	--
33.	25-07-2022	44.56	14.21	5.45	8.25	--

Continue…

Name of Location		SAMUDRA TOWNSHIP – STP				
Sr. No.	Date of Monitoring	Parameter with Results				
		PM_{10} µg/m³	$PM_{2.5}$ µg/m³	SO_2 µg/m³	NO_2 µg/m³	CO mg/m³
34.	28-07-2022	38.45	11.35	6.23	9.26	--
35.	01-08-2022	87.49	31.58	13.52	19.23	--
36.	04-08-2022	70.29	24.19	11.74	24.68	--
37.	08-08-2022	87.61	27.81	16.29	28.83	--
38.	11-08-2022	74.2	22.14	13.94	21.38	--
39.	15-08-2022	84.18	15.73	12.51	25.05	--
40.	18-08-2022	72.69	28.3	9.59	15.83	--
41.	22-08-2022	86.48	29.72	14.42	24.33	--
42.	25-08-2022	89.49	33.2	12.83	22.15	--
43.	29-08-2022	68.24	26.86	10.98	17.36	--
44.	01-09-2022	82.32	26.61	17.36	21.44	--
45.	05-09-2022	73.72	29.73	13.74	23.18	--
46.	08-09-2022	71.29	27.81	11.24	26.92	--
47.	12-09-2022	86.48	25.59	16.9	24.37	--
48.	15-09-2022	81.21	21.26	13.18	19.63	--
49.	19-09-2022	77.63	24.69	12.47	21.58	--
50.	22-09-2022	89.02	32.46	15.58	31.06	--

Continue…

Name of Location		SAMUDRA TOWNSHIP – STP				
Sr. No.	Date of Monitoring	Parameter with Results				
		PM_{10} µg/m³	$PM_{2.5}$ µg/m³	SO_2 µg/m³	NO_2 µg/m³	CO mg/m³
51.	26-09-2022	67.48	29.08	16.84	26.21	--
52.	29-09-2022	71.36	34.17	14.15	19.11	--
Permissible Value as per NAAQMS		**100.0**	**60.0**	**80.0**	**80.0**	**2.0**
Test Method		**IS - 5182, Part- 23**	**UERL/AIR/ SOP/11**	**IS - 5182, Part - 2**	**IS - 5182, Part - 6**	**IS - 5182, Part - 10**

Nikunj D. Patel
(Chemist)

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Results of Ambient Air Quality Monitoring

Name of Location		SAMUDRA TOWNSHIP CUSTOMER CARE				
Sr. No.	Date of Monitoring	Parameter with Results				
		PM_{10} µg/m³	$PM_{2.5}$ µg/m³	SO_2 µg/m³	NO_2 µg/m³	CO mg/m³
1.	07-04-2022	79.43	26.75	10.44	18.23	NOT DETECTED
2.	08-04-2022	85.66	32.87	13.45	21.63	--
3.	11-04-2022	75.6	30.44	14.1	22.87	--
4.	12-04-2022	69.34	24.61	16.21	22.62	--
5.	18-04-2022	83.56	25.89	14.56	19.85	--
6.	21-04-2022	88.95	33.45	17.23	23.6	--
7.	25-04-2022	87.5	37.25	14.88	21.56	--
8.	28-04-2022	85.23	33.21	13.45	18.56	--
9.	02-05-2022	68.45	22.56	9.74	14.56	--
10.	05-05-2022	73.45	25.67	12.45	17.21	--
11.	09-05-2022	82.45	28.93	11.56	15.37	--
12.	12-05-2022	70.25	25.46	14.21	19.25	--
13.	16-05-2022	67.84	21.35	17.23	21.31	--
14.	18-05-2022	79.14	27.85	12.65	17.43	--
15.	23-05-2022	86.24	32.45	13.82	14.56	--
16.	26-05-2022	77.25	26.75	15.23	19.37	--

Continue…

Name of Location		SAMUDRA TOWNSHIP CUSTOMER CARE				
Sr. No.	Date of Monitoring	Parameter with Results				
		PM_{10} µg/m³	$PM_{2.5}$ µg/m³	SO_2 µg/m³	NO_2 µg/m³	CO mg/m³
17.	30-05-2022	71.45	23.18	12.15	15.78	--
18.	02-06-2022	56.78	19.45	11.34	17.68	--
19.	06-06-2022	82.34	23.56	10.23	15.32	--
20.	09-06-2022	74.56	27.82	15.41	22.34	--
21.	13-06-2022	54.34	18.76	15.23	20.18	--
22.	15-06-2022	67.23	25.46	11.78	16.75	--
23.	20-06-2022	76.21	30.15	10.17	17.85	--
24.	23-06-2022	83.53	32.15	16.25	21.35	--
25.	27-06-2022	72.34	28.17	14.38	20.18	--
26.	29-06-2022	61.14	20.21	12.19	17.25	--
27.	04-07-2022	45.67	14.23	7.56	9.12	NOT DETECTED
28.	07-07-2022	22.34	7.24	5.12	7.21	--
29.	11-07-2022	18.94	5.67	4.1	7.15	--
30.	14-07-2022	20.14	7.15	6.23	8.24	--
31.	18-07-2022	25.67	9.21	5.34	8.15	--
32.	21-07-2022	33.45	10.44	7.23	9.12	--
33.	25-07-2022	40.12	13.21	6.12	7.34	--

Continue…

Name of Location		SAMUDRA TOWNSHIP CUSTOMER CARE				
Sr. No.	Date of Monitoring	Parameter with Results				
		PM_{10} µg/m³	$PM_{2.5}$ µg/m³	SO_2 µg/m³	NO_2 µg/m³	CO mg/m³
34.	28-07-2022	32.17	10.22	5.23	8.16	--
35.	01-08-2022	62.5	24.84	11.31	17.73	--
36.	04-08-2022	68.57	27.83	15.72	21.3	--
37.	08-08-2022	79.27	31.52	13.78	17.71	--
38.	11-08-2022	66.67	22.04	16.21	23.38	--
39.	15-08-2022	69.91	24.17	19.69	26.9	--
40.	18-08-2022	83.42	32.56	16.53	19.32	--
41.	22-08-2022	81.52	34.28	12.47	17.52	--
42.	25-08-2022	74.85	29.47	9.97	14.79	--
43.	29-08-2022	71.29	26.52	11.29	19.48	--
44.	01-09-2022	67.36	18.32	16.57	22.31	--
45.	05-09-2022	64.72	22.73	12.36	18.46	--
46.	08-09-2022	71.84	29.01	18.47	26.84	--
47.	12-09-2022	74.42	24.62	16.34	20.26	--
48.	15-09-2022	61.27	32.57	14.63	17.56	--
49.	19-09-2022	86.08	21.43	20.13	27.86	--
50.	22-09-2022	59.97	28.74	23.87	29.04	--

Continue…

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Name of Location		SAMUDRA TOWNSHIP CUSTOMER CARE				
Sr. No.	Date of Monitoring	Parameter with Results				
		PM_{10} µg/m³	$PM_{2.5}$ µg/m³	SO_2 µg/m³	NO_2 µg/m³	CO mg/m³
51.	26-09-2022	69.56	33.94	14.27	17.25	--
52.	29-09-2022	77.13	27.56	17.16	23.14	--
Permissible Value as per NAAQMS		**100.0**	**60.0**	**80.0**	**80.0**	**2.0**
Test Method		**IS - 5182, Part- 23**	**UERL/AIR/ SOP/11**	**IS - 5182, Part - 2**	**IS - 5182, Part - 6**	**IS - 5182, Part - 10**

Nikunj D. Patel
(Chemist)

UNISTAR ENVIRONMENT & RESEARCH LABS PVT. LTD. * GUJARAT VAPI.

Jaivik S. Tandel
(Manager - Operations)

Results of Noise Level Monitoring

Location Name		SAMUDRA TOWNSHIP – STP					
Sr. No.	Sampling Date and Time	Noise Level Leq. dB(A) - Day Time					
		06-04-2022	18-05-2022	11-06-2022	19-07-2022	12-08-2022	07-09-2022
1	06:00 to 07:00	61.3	62.6	62.5	62.6	61.8	60.5
2	07:00 to 08:00	63.5	65.6	61.5	68.3	62.8	63.8
3	08:00 to 09:00	66.7	68.6	60.5	64.2	68.6	65.5
4	09:00 to 10:00	65.5	65.5	62.3	69.8	65.5	66.3
5	10:00 to 11:00	68.2	68.3	60.5	62.2	68.3	63.4
6	11:00 to 12:00	64.5	68.9	63.4	68.8	68.9	68.2
7	12:00 to 13:00	63.9	65.4	64.2	67.2	65.4	66.5
8	13:00 to 14:00	66.7	66.3	65.5	62.5	66.3	63.0
9	14:00 to 15:00	62.6	68.5	64.9	67.1	68.5	64.5
10	15:00 to 16:00	65.5	64.5	63.6	61.5	64.5	63.7
11	16:00 to 17:00	69.1	68.3	65.3	66.8	68.3	64.4
12	17:00 to 18:00	69.2	65.6	62.8	65.7	65.6	65.1
13	18:00 to 19:00	64.5	67.2	60.4	68.1	67.2	62.9
14	19:00 to 20:00	62.3	63.5	59.4	65.2	63.5	64.2
15	20:00 to 21:00	60.6	60.5	58.5	64.1	60.5	62.8
16	21:00 to 22:00	60.5	62.8	59.3	61.2	61.4	62.9
Day Time		<75 dB (A)					

Continue...

Location Name		SAMUDRA TOWNSHIP – STP					
Sr. No.	Sampling Date and Time	Noise Level Leq. dB(A) – Night Time					
		06-04-2022	18-05-2022	11-06-2022	19-07-2022	12-08-2022	07-09-2022
1	22:00 to 23:00	59.34	61.6	57.5	63.2	62.7	61.3
2	23:00 to 24:00	56.43	60.5	55.6	57.8	60.5	59.4
3	24:00 to 01:00	54.32	59.5	57.2	58.9	59.5	59.9
4	01:00 to 02:00	57.89	60.5	55.8	62.1	60.5	61.6
5	02:00 to 03:00	51.23	58.1	54.2	55.4	58.1	57.4
6	03:00 to 04:00	53.87	60.5	54.9	59.4	60.5	60.1
7	04:00 to 05:00	56.34	62.3	55.3	60.2	62.3	63.5
8	05:00 to 06:00	57.23	61.5	56.5	64.2	60.2	63.0
Night Time		<70 dB (A)					

Test Method	IS: 9989 : 1981

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Results of Noise Level Monitoring

Location Name		SAMUDRA TOWNSHIP CUSTOMER CARE					
Sr. No.	Sampling Date and Time	Noise Level Leq. dB(A) - Day Time					
		08-04-2022	23-05-2022	09-06-2022	06-07-2022	20-08-2022	20-09-2022
1	06:00 to 07:00	61.5	61.2	62.3	60.5	64.4	62.5
2	07:00 to 08:00	66.7	65.2	64.2	58.4	65.2	61.5
3	08:00 to 09:00	60.5	62.9	63.1	62.5	64.8	60.5
4	09:00 to 10:00	63.9	65.1	64.5	69.4	64.3	62.3
5	10:00 to 11:00	64.5	63.9	63.3	65.4	63.8	61.1
6	11:00 to 12:00	65.2	59.8	65.5	66.3	59.2	64.8
7	12:00 to 13:00	66.1	61.2	63.2	66.7	61.9	64.2
8	13:00 to 14:00	60.6	61.0	61.9	64.9	60.2	65.5
9	14:00 to 15:00	61.8	61.4	62.5	66.8	61.9	63.8
10	15:00 to 16:00	62.5	61.3	64.2	63.6	62.4	63.6
11	16:00 to 17:00	63.2	61.0	61.5	64.8	64.7	64.9
12	17:00 to 18:00	65.4	65.2	64.6	62.2	66.5	62.8
13	18:00 to 19:00	62.1	59.8	60.2	68.4	60.2	61.2
14	19:00 to 20:00	60.2	60.1	61.5	67.1	65.3	59.4
15	20:00 to 21:00	58.9	56.8	60.5	60.2	58.3	58.5
16	21:00 to 22:00	59.2	59.7	59.8	63.4	62.7	59.9
Day Time		<75 dB (A)					

Continue…

Location Name		SAMUDRA TOWNSHIP CUSTOMER CARE					
Sr. No.	Sampling Date and Time	Noise Level Leq. dB(A) - Night Time					
		08-04-2022	23-05-2022	09-06-2022	06-07-2022	20-08-2022	20-09-2022
1	22:00 to 23:00	56.24	57.1	58.2	59.6	58.2	59.4
2	23:00 to 24:00	58.25	56.9	57.5	60.3	58.8	61.8
3	24:00 to 01:00	57.25	54.1	55.2	60.5	53.8	57.7
4	01:00 to 02:00	55.21	59.9	56.5	61.2	58.6	54.9
5	02:00 to 03:00	54.59	52.5	54.2	57.8	53.6	53.2
6	03:00 to 04:00	58.69	53.0	54.5	53.5	54.7	54.5
7	04:00 to 05:00	59.23	56.4	57.2	58.2	57.2	56.8
8	05:00 to 06:00	57.38	59.9	57.5	59.3	60.5	59.1
Night Time		<70 dB (A)					

Test Method	IS: 9989 : 1981

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(Manager - Operations)

Results of Stack Monitoring

Sr. No.	Parameter	Unit	May - 2022 Adani Hospital DG Set 12-05-2022	GPCB LIMIT	Method of Test
1.	Particulate Matter	mg/Nm^3	18.7	**150**	**IS 11255 (Part - 1)**
2.	Sulphur Dioxide	ppm	5.25	**100**	**IS 11255 (Part - 2)**
3.	Oxide of Nitrogen	ppm	29.14	**50**	**IS 11255 (Part - 7)**
4.	Carbon Monoxide	mg/Nm^3	3.5	--	**UERL/AIR/SOP/18**
5.	Non Methyl Hydro Carbon	ppm	Not Detected	--	**UERL/AIR/SOP/27**

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Minimum Detection Limit

Ambient Air Quality Monitoring

Sr. No.	Test Parameter	Unit	MDL
1	Particulate Matter (PM10)	µg/m3	5 µg/m3
2	Particulate Matter (PM10)	µg/m3	5 µg/m3
3	Sulphur Dioxide (SO2)	µg/m3	4 µg/m3
4	Nitrogen Dioxide (NO2)	µg/m3	5 µg/m3
5	Carbon Monoxide (CO)	mg/m3	0.01 mg/m3
6	Ammonia (NH3)	µg/m3	5 µg/m3
7	Ozone (O3)	µg/m3	5 µg/m3
8	Lead (Pb)	µg/m3	0.5 µg/m3
9	Nickle (Ni)	ng/m3	1 ng/m3
10	Arsenic (As)	ng/m3	1 ng/m3
11	Benzene	µg/m3	1µg/m3
12	Benzo(o)Pyrene	ng/m3	0.1 ng/m3
14	Hydro Carbon	µg/m3	1 µg/m3

Stack Emission Monitoring

Sr. No.	Test Parameter	Unit	MDL
1	Suspended particulate matter	mg/Nm3	2 mg/Nm3
2	Sulphur Dioxide SOX	mg/Nm3	4 mg/Nm3
3	Oxides of Nitrogen NOX	mg/Nm3	5 mg/Nm3

STP Water			
Sr. No.	**Test Parameter**	**Unit**	**MDL**
1	pH @ 25 ° C	--	2
2	Total Suspended Solids	mg/L	4
3	Biochemical Oxygen Demand (BOD) (5 days at 20 ° C)	mg/L	1
4	Residual chlorine	mg/L	0.1
5	Fecal Coliform	MPN Index/100ml	<2

Annexure – 3

adani
Foundation

CSR GUJRAT

Six Monthly Report 2022-23

Adani Foundation
Adani House, Port Road, Mundra – Kutch 370 421
[info@adanifoundation.com] [www.adanifoundation.com]

Taking inspiration from the Gandhian philosophy of trusteeship, the Adani Foundation strives to create sustainable opportunities. It does so by facilitating quality education, enabling the youth with income-generating skills, promoting a healthy society by women empowerment and supporting infrastructure development.

With an aim to contribute to the holistic development of communities, the Adani Foundation is contributing to the global agenda of meeting Sustainable Development Goals (SDGs).

Adani Foundation Gujrat sites are catalyst for rural communities residing in villages of Kutch,, Surat and Bharuch District. AF has transformed thousands of lives by serving community to uplift their standard of living by performing CSR activities in various in terms of Infrastructure, Social development, Education, Agriculture, Women empowerment, Water conservation and management and empowering fishermen and Tribal community.

Inside

CSR KUTCH

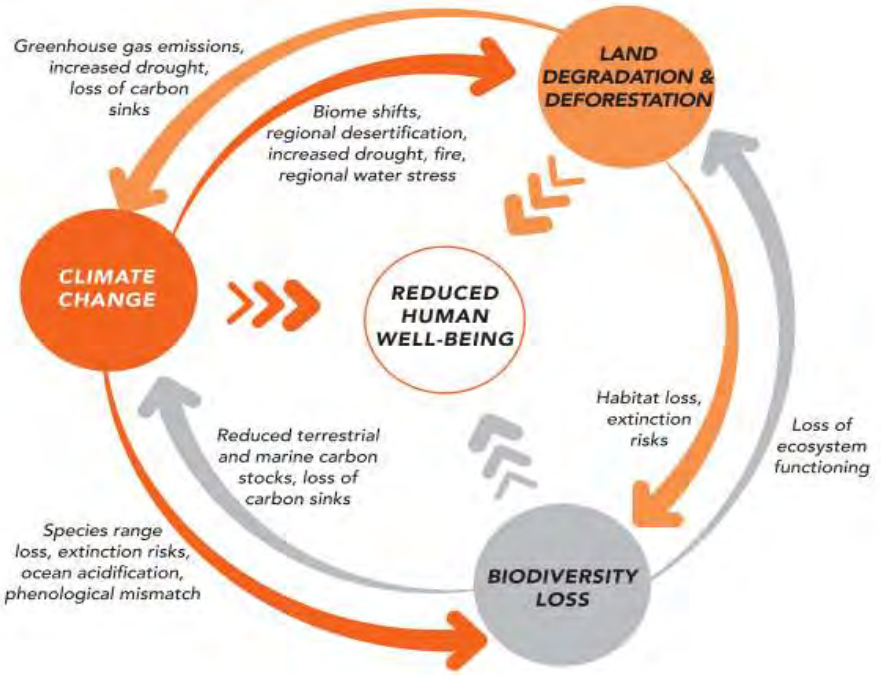
ENVIRONMENT SUSTAINABILITY

Environmental sustainability is the responsibility to conserve natural resources and protect global ecosystems to support health and wellbeing for present and future. These components are closely interrelated and mutually re-enforcing Under Corporate Environmental responsibility.

To make connections between human actions Environment & biological diversity found within a habitat and/or ecosystem, Adani Foundation executing various Project as Below

Biodiversity conservation: to preserve biodiversity and Natural Resources.

Regenerative capacity: Protect the depletion of natural resources and keep the harvest rate of renewable resources within the capacity of regeneration.



Environment Sustainability Projects : Ensuring ecological balance, protection of flora and fauna, terrestrial and coastal spices conservation, welfare, agro forestry, conservation of natural resources and maintaining quality of soil, air and water

REDUCING CARBON FOOTPRINT

1. Miyawaki – Nana Kapaya

Miyawaki- Dense Plantation is developed n year 2021-22 at Nana Kapaya Village in 2.0 acre land. Miyawaki plot is very close to sewage water tank so watering to plantation by the same.

As discussed with villagers and Adani Foundation, we proposed the close or dense plantation at site- called Miyawaki Types of Plantations with following **four major compartments** (45X20 meters approx.) and with following strategies:

1. Mixed Plantation dominant Drought Resistant Plants
2. Mixed Plantation dominant by Larger Leaves
3. Mixed Plantation dominant by Saline Resistant Plants
4. Mixed Plantation dominant by Medicinal Values.

Plantation of 5880 saplings of different 42 spices is completed which will resulted in dense forest due to good rain this year.

REDUCING CARBON FOOTPRINT

2. **Smritivan Memorial park**– Bhuj

Smritivan Memorial park is a unique initiative by Prime Minister in order to commemorate the death of about 13,805 people during this massive earthquake which had its epicenter in Bhuj District.

The memorial will occupy around 406 acres of space of the **Bhujia Dungar near Bhuj, Kutch** that will show people's **oppressive response to a natural disaster**.

Adani Foundation has supported for 47000 saplings in Smriti van @ 100 Las INR
In September 2022, Prime Minister had inaugurated smriti van which is the biggest Miyawaki Forest in Gujrat.

REDUCING CARBON FOOTPRINT

3. Mangroves Biodiversity Park

Mangroves are complex ecosystems that provide coastal bio-shield to habitats and societies from natural disasters. Important roles played by the mangroves are; stabilizing the coastline, protect water quality, reduce coastal flooding, reduce the effect of coastal cyclone, etc.

Mangroves are one of the productive ecosystems which contribute a number of ecosystem services to the nature as well as to human and are integral in the control of climate on the Earth.

With a vision to Enhance the diversity of mangrove and its associated species in suitable coastal region of Kachchh, which in turn would enhance the faunal diversity and fishery resources of the area by providing suitable habitats and breeding ground. The ultimate aim of the project is to improve overall coastal biodiversity of the region which in turn assist in improving the livelihood of the coastal populace. Further, the area will serve as a base model for researchers, knowledge center for students and promote awareness for conservation and management of mangroves for the benefit of human and the environment.

REDUCING CARBON FOOTPRINT

Total five mangrove species, such as Ceriops, Aegiceras and Rhizophora were selected which in turn enhanced the dependent faunal diversity of the area. Thereby, there will be an increase considerable biodiversity of the area. **The initial pilot trails were undertaken in an area of approximately 16 hector during the period between 2018 and 2021 with the active participation of local communities.** Current year 4 Hector plantation is in progress which will be resulted in 20 Hector Mangroves Biodiversity Park within one year

S. NO	Mangrove Associate	Life form
1	Suaeda Spp.	Herb
2	Porteresia coarctata	Herb
3	Opuntia elatior	Shrub
4	Sesuvium portulacastrum	Herb
5	Ipomoea biloba	Climber
6	Salvadora persica L.	Shrub
7	Urochondra setulosa	Herb




REDUCING CARBON FOOTPRINT

Sr. No	Species	Common Name
1.	Boleophthalmus dussumieri (Valenciennes, 1837)	Levti Mud Skipper
2.	Scartelaos histophorus (Valenciennes, 1837)	Walking goby
3.	Periophthalmus waltoni Koumans, 1941	Walton's mudskipper
4.	Austruca iranica (Pretzmann, 1971).	Arabian Fiddler Crab
5.	Austruca sindensis (Alcock, 1900)	Indus Fiddler Crab
6.	Austruca lactea (De Haan, 1835)	Milky Fiddler Crab
7.	Parasesarma plicatum (Latreille, 1803)	Mudflat crab
8.	Dotilla blanfordi Alcock, 1900	Sand bubbler crab
9.	Scylla serrata (Forskål, 1775)	Mud Crab
10.	Eurycarcinus orientalis A. Milne-Edwards, 1867	Violet Crab
11.	Pirenella cingulata (Gmelin, 1791)	Horn snail
12.	Telescopium telescopium (Linnaeus, 1758)	Telescope snail
13.	Mitrella blanda (G. B. Sowerby I, 1844)	Dove snail
14.	Bakawan rotundata (A. Adams, 1850)	Mangrove dweller
15.	Protapes cor (G. B. Sowerby II, 1853)	Venus clam
16.	Callista umbonella (Lamarck, 1818)	Striped venus clam
17	Solen digitalis Jousseaume, 1891	Razor clam

1. *Boleophthalmus dussumieri*

2. *Scartelaos histophorus*

3. *Periophthalmus waltoni*

4. *Austruca sindensis*

5. *Austruca lactea*

6. *Parasesarma plicatum*

REDUCING CARBON FOOTPRINT

4. Home biogas -

4,176 TONS OF ANIMAL MANURE TREATED

359,687 HOURS OF CLEAN COOKING;
9.3 TONS OF BIOGAS CREATED
325 TONS OF FIREWOOD REPLACED;
47,375 HOURS SAVED ON REDUCTION OF FIREWOOD &COLLECTION
1225 TONS CO2 EMISSION REDUCTION

Reducing organic waste,
Transitioning to renewable energy
Motivation for reduction in use for fertilizer

Home biogas is the Israel based company was founded in 2012 manufactures dynamic biogas unit not only for farm waste but for kitchen waste too. Under Gram Utthan Project, Adani Foundation is supporting home biogas to farmers periphery Villages.

Promotion of Natural Farming–Home biogas And Improving the health and living conditions for the millions of families that are still cooking on charcoal and wood. Adani Foundation is not only supporting but creating awareness to save environment and health of the community who regularly cooking on Chula. **It is proven that one hour cooking on Chula is as dangerous as smoking 40 cigrates**.

Till date 225 farmers are utilizing it with satisfaction and considerable outcome by saving Average Rs. 23,400 for gas and fertilizer as well – with Economic benefit of Rs,52.65 Lacs.

135 Farmers are linked up with Gobardhan Yojana in which DRDA is providing Biogas with Rs. 5000 Contribution. Adani Foundation has worked as a facilitator between DRDA and Beneficiaries farmers in filling and submission of forms. Total 360 farmers are supported with Biogas as sustainable environment protection

5. Water Conservation Project

Since 10 years considerable Water Conservation Work carried out in Mundra Taluka. Due to satisfactory rain in current year 1.11 mtr ground water table increased in coastal belt of Mundra as per Government Figures. Our water conservation work is as Below.

- Large number of water harvesting structure (18 Nos. of check dams in coordination with salinity department) and Augmentation of 3 check dams
- Ground recharge activities (pond deepening work for more than 56 ponds) individually and 26 ponds under Sujlam Suflam Jal Abhiyan were built leading to a significant increase in water table and higher returns to the farmers
- Roof Top Rain Water Harvesting 145 Nos. **(40 Nos current year)** which is having 10,000 litre storage which is sufficient for one year drinking water purpose for 5 people family.
- Recharge Bore well 201 Nos **(12 Nos current yr)** which is best ever option to direct recharge the soil
- Drip Irrigation approx. 1156 Farmers benefitted in coordination with Gujrat Green Revolution Company till date
- Bund construction on way of Nagmati River could save more than 575 MCFT water quantity which recharged in ground due to which bore well depth decreased by 50-100 Ft in Zarpara, Bhujpur and Navinal Vadi Vistar.
- **Check dam gate valve construction at Bhujpur which controlled more than 350 MCFT water to go into sea and get recharged current year.**
- **Pond Pipe line work at Prasla Vistar Zarpara which increase recharge capacity more than 25% in 100 hector area.**

Water conservation and Management

Process Flow for Rooftop Rain Water Harvesting System

Social Survey & TDS mapping

Community Contribution

RRWHS

Impact

- Portable water at door step
- Cost saving for portable water
- Improved water quality with
- Creates water conservation awareness in rural community
- Improves standard of living of rural community

Total Target for 2022-23	40
RRWHS Constructed in Q1	25
Population Impacted	300+
Savings per household	15000+

TDS difference between Ground water and RRWHS water

REDUCING CARBON FOOTPRINT

6. Tree Plantation

Till the date 1,40,000 Tree have been planted at various Public places , Schools, GP and crematorium with their responsibility to nurture and maintain regularly.

For this passionate work our team Member Mr. Karshan Gadhvi was Felicited with Van Mitra Award by Forest department and Government of Gujarat.

EDUCATION PROJECT

Adani Vidya Mandir, Bhadreshwar (SDG - 4/4.1)

EDUCATION: FREE AND COMPULSORY - vision of Adani Foundation to provide cost-free education, food, uniform, books to the children of economically challenged families of Mundra Bock. Adani Vidya Mandir, Bhadreshwar was established in June 2012, with aim of uplifting the communities through education. The school is equipped with excellent infrastructure and resources required for all-round development of the student. The child is given admission in class 1 and is molded to be an educated and a good human being by experienced and compassionate teachers. The school follows a curriculum designed by GSEB. **507 underprivileged students of Fisherman & Maldhari communities from 8 villages benefitted costfree education at the school**

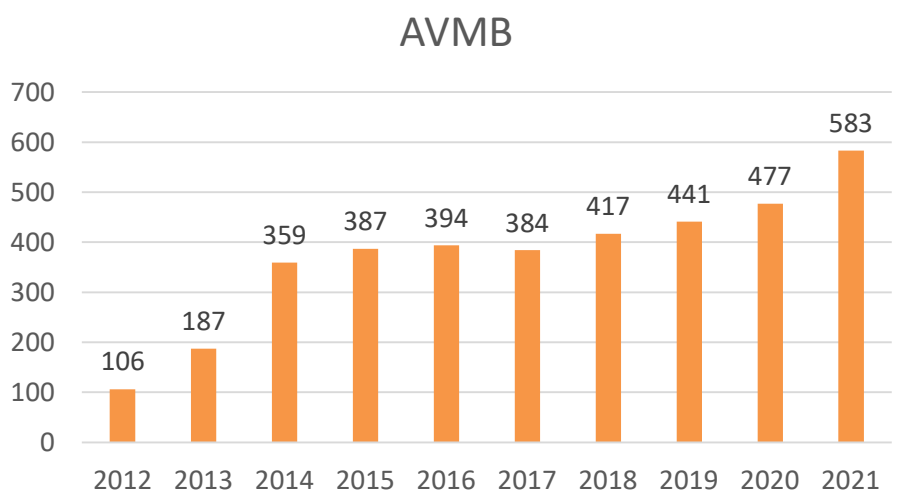
Teachers Day Celebration with facilitation of all teachers and awarded 5 best teachers in academics. District Education Officer Mr. Prajapati graced the occasion and motivated the staff.

EDUCATION PROJECT

Two milestone achievement in this six months

- Adani Vidya Mandir Bhadreshwar Gujrat Board Standard 10th Examination Result is 100%.
- NABET Certification received after rigorous process of documentation and audit committee visit.

Adani Vidya Mandir Bhadreshwar		
2021-22 (10th Board)		
NO	GRADE	STUDENTS
1	Above 80 %	3
2	60-80%	18
3	40-60%	10
	TOTAL	31
Result		100%



PROJECT UTTHAN

To provide learning exposure. Utthan project encourages students to gain knowledge and read books.

Along with reading, various competitions and exercises are conducted like reading, fluency, book reviews, vocab building to hone their reading skills.

Utthan believes in creating atmosphere for students which fulfills need of holistic learning of rural students who are devoid of advanced education.

Activities like movie showing and discussing its morale helps students to increase their analytical skills.

PROJECT UTTHAN

Total village covered	Total School	Total Students	Priya Vidhyarthi	Book issue by library	Language reach (English)	Mother's meet	IT on wheel	Students participate in summer camp	Competitive exam
33	59	9895	2600	41316	5221	4253	2101 (std.6to8)	5316	898 (JNV, NMMS & PSE)

૨૦૨૦-૨૧ના જિલ્લામાં તાલુકા વાઇઝ ગુણોત્સવના ગ્રેડ

તાલુકો	A+	A	B	C	D	કુલ
અબડાસા	૦૧	૨૮	૧૧૬	૨૬	૦૨	૧૭૩
અંજાર	૦૦	૦૫	૯૯	૨૫	૦૦	૧૨૯
ભચાઉ	૦૦	૦૨	૧૨૧	૪૬	૦૩	૧૭૨
ભુજ	૦૧	૧૪	૧૭૮	૧૩૮	૧૧	૩૪૨
ગાંધીધામ	૦૦	૦૫	૪૩	૦૭	૦૧	૫૬
લખપત	૦૦	૦૦	૫૩	૪૭	૦૭	૧૦૭
માંડવી	૦૦	૦૯	૧૨૫	૩૩	૦૦	૧૬૭
મુન્દ્રા	૦૦	૦૨	૮૩	૨૦	૦૦	૧૦૫
નખત્રાણા	૦૧	૨૦	૧૨૮	૨૧	૦૦	૧૭૦
રાપર	૦૦	૦૪	૧૮૦	૮૭	૨૭	૨૯૮
કુલ	૦૩	૮૯	૧૧૨૬	૪૫૦	૫૧	૧૭૧૯

૨૦૨૧-૨૨ના જિલ્લામાં તાલુકા વાઇઝ ગુણોત્સવના ગ્રેડ

તાલુકો	A+	A	B	C	D	કુલ
અબડાસા	૦૫	૧૫	૧૨૫	૨૫	૦૦	૧૭૦
અંજાર	૦૨	૧૬	૮૯	૨૦	૦૨	૧૨૯
ભચાઉ	૦૦	૦૮	૧૨૬	૩૪	૦૪	૧૭૨
ભુજ	૨૦	૫૮	૧૮૦	૭૭	૦૯	૩૪૪
ગાંધીધામ	૦૦	૦૭	૩૮	૧૧	૦૦	૫૬
લખપત	૦૧	૧૭	૬૩	૨૫	૦૨	૧૦૮
માંડવી	૦૬	૨૭	૧૦૭	૨૫	૦૧	૧૬૬
મુન્દ્રા	૧૪	૪૫	૩૯	૦૭	૦૦	૧૦૫
નખત્રાણા	૦૬	૩૪	૧૧૬	૧૪	૦૧	૧૭૧
રાપર	૦૩	૦૪	૧૬૦	૧૦૫	૨૨	૨૯૪
કુલ	૫૭	૨૩૧	૧૦૪૩	૩૪૩	૪૧	૧૭૧૫

- ✓ Government of Gujarat for strengthening the quality outcomes, launched a programe called Gunotsav, or 'Celebrating Quality'.
- ✓ Mundra - A+ : 14/105; in which 7/34 Utthan schools
- ✓ Increase gunotsav result in almost all schools.
- ✓ Teachers, Principals, SMC members & Village leaders appreciate effort of Utthan Sahayak

PROJECT UTTHAN

- ✓ MOU between DPEO, Kutch and Adani foundation for include new 17 schools – Total 59 Schools.
- ✓ Conduct Baseline assessment & Utthan Sahayak Start teaching to progressive learner. 96 students Mainstreamed from progressive Learner this year. 730 students mainstreamed last year.
- ✓ Promoting co-curricular activities.
- ✓ Students write Letter to Supermom on Mothers day.
- ✓ Creating joyful learning spaces: Smart TV & Software, Sports kit, Music kit & Book supports.
- ✓ All Utthan School Linked Up with Google Map
- ✓ Various day were celebrated by Utthan Sahayak like, Yoga day, Gurupurnima, Rakshabandhan, Sports day, Azadika Amrit Mahotsav. Children from all classes participated enthusiastically

WOMEN EMPOWERMENT PROJECT

"You can tell the condition of a nation by looking at the status of its women" – Women are central to the entire development process, be it in an individual family, village, state and to the whole nation.

The below mentioned figure shows determinants associated with the empowerment of women and these are the challenges for us as a CSR to work upon.

Adani Foundation is considering all parameters as a part of Empowerment.

- Education – Uthhan Project promotes girl child education, Creating awareness through various Govt schemes i.e. Vahali Dikri Yojana, Sukanya Samriddhi Yojana etc. till date covered more than 1200 girl child to get benefit out of it.
- Health and Nutrition – Home biogas is the best example of intervention of women health – 225 home biogas is supported to farmers which is good for lungs health
- Skill Development and Income Generation – Adani Foundation is working with 15 Self help group and supporting to develop entrepreneur skills to become self reliant, sourcing more than 500 women to absorb in various job – this will give them identity, confidence and right to speak in any decision for home, village and working area.
- Drinking Water and Sanitation – Total 145 Roof Top Rain Water Harvesting is supported for reducing hassle of the women to fetch the water as well as making clean water available.

UDAAN - MUNDRA

Dashboard (June - Sep) sustainable project revenue generated

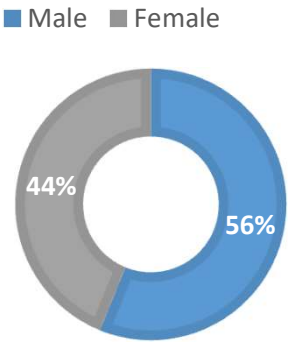
Total Institutes engaged 177

School	College	ITI	ASDC
125	45	2	5

Total Visitors

11464 participants

GENDER RATIO



Impact

INSPIRE TO ASPIRE

Igniting thoughts for the bright future.

INDUCING KNOWLEDGE

Widening of knowledge horizon.

UNFORGETABLE EXPERIENCE

Visitors get to observe and experience the operations on sites.

THOUGHT PROVOKING

Stimulating young minds to think out of the box.

ENCOURAGE TOWARDS GOAL

APSEZ existence proves that dreams come true if we convert them in GOALS.

INFUSE CREATIVITY

Students gets exposure which enable them to provoke ideas in them during visits.

Project Udaan

Under this project exposure tours are organised wherein school students are given a chance to visit the Adani Group facilities such as Adani Port, Adani Power and Adani Wilmar refinery at Mundra, Hazira, Dahanu, Kawai, Tirorda and Dhamra to get an insight into the large-scale business operations and thus get inspired to dream big in life. The exercise stimulates the young minds to dream big and help them become entrepreneurs, innovatores and achievers of tomorrow, and thus play an active role in the process of nation building

UDAAN - MUNDRA

Awards & Recognitions

10,000+ **Positive Feedbacks**

100+ **Mementos received**

55+ **Certificates received**

Adani Foundation, Udaan Project invited the members of self-finance School Association, Gujarat for an exposure visit. 90 participants were facilitated with extraordinary experience of Port, Power, Wilmar and Solar plants visit.

FARMERS SUSTAINABLE LIVELIHOOD PROJECTS

Promotion of Natural Farming

- To promote Natural farming Adani Foundation has originated cow based farming initiative with interconnected techniques which can increase farmer yield – our main objective is to improve quality of soil.

- **Implementation**
- Survey and identification of farmers to adopt Natural farming –Total **950 Farmers are selected as criteria – coordinated with ATMA for support of 10,800 INR per year by Direct Bank Transfer.**
- **135 farmers facilitated by DRDA Scheme – Gobardhan Yojana of Biogas with Contribution of Rs. 5000.**
- Water & Soil Testing- Most of Farm soil contain low organic carbon.
- Arranged Workshop & Hands on training for them which was conducted by Agri expert ,KVK and Progressive farmers with 1000+ farmers
- 325 Jivamrut unit have been set-up. Which is facilitated through with farmer Contribution.
- 257 Farmers have started to preparing JivaMrut & Gaukrupa Amrutam Bio-fertilizer and using in agri crop. Series of Training is arranged by ATMA and Adani Foundation

FARMERS SUSTAINABLE LIVELIHOOD PROJECTS

Prakrutik Sahkari Mandli

Formation of Shree Raj Shakti Prakrutik Kheti sahkari Mandali Limited Mangara and register Under Gujarat CO-operative SOCIETY act-1961 with 29 Members which is the First Organic Company of Registered across Kutch.

Objective

1.To promote natural Farming practices as group and individual

2.Value addition of Agri Produce and find out common Market to sell.

3.Set Up Cleaning, Grading Packaging and Processing Unit.

4. Established stall for input and output of Agri Produce ,Medicine ,Agri equipment.

5. Avail Agri machinery and equipment on rent to Farmers.

6.Facilittaion of Government Scheme.

7.Arrnged Exposure and Agri Training Program.

8. Laboratory et-up for soil and water Analysis

Shree Raj Mandli is planning to sale Organic Vegetables, Fruits, Grains, jevamrut and Mineral mixture. Rented Shredder Machine and preparation of bio mass is also next level planning of Mandli.

FARMERS SUSTAINABLE LIVELIHOOD PROJECTS

Farmer's Producer Organization

Kutch Kalpaturu Producer Company (KKPC) is established in the year of 2020 to address the challenges faced by the farmers, particularly to provide common platform for inputs & out put The company has been set up with 237 Farmers shareholders. Half year Turn Over of the company is 7.18 lacs

Vision –

Promotion of rural livelihood through sustainable & innovative agricultural and allied practices in the collective manner through Input and Out Support.

Mission:-

- Reduce Transaction cost per unit area through linking farmer with Kutch Kalpaturu Producer Company (KKPC) to Procure Input at reasonable prize.
- Imbibe Knowledge to adopt Modern Agri technology through training, Exposures and demonstration to Increase Production & Productivity.
- Enhance value of Agri produces and set up sustainable arrangement to sell their Produces.
- Sorting, grading and value addition for Proper Marketing of Agri Produces to fetch High value for the Betterment of farmers and shareholder in a sustainable way.
- Aware and Facilitation of Government Agriculture scheme over Farmers.
- Establishment of Agro Center at Various Village

WIP:-

In past six months KKPC worked for Date Packaging box, Milk Supply in Colonies and Shantivihar ,NB 21 Off suits Supply, Vegetable Seed Mineral Mixture and Cattle feed.

FARMERS SUSTAINABLE LIVELIHOOD PROJECTS

Pashudhan : " Fodder Support Programme, Individual Fodder Cultivation and Preventive Health Care

- Adani Foundation provides Good Quality dry and green fodder to 29 Villages. Project is covering total 14116 Cattels / AF Provide Dry and green Fodder to 29 Villages of our vicinity which covering 33072 cattle of 2747 farmers.

- Fodder Cultivation- To made fodder sustain villages - 100 Acre Gauchar land of Zarpara and 25 Acre in Siracha village is being cultivated for the same.

- To protect Cattles against Bovine Brucellosis zoonotic disease, Awareness and vaccination program is ongoing with Kutch fodder fruit & Forest development trust (KFFT) in our 11 Villages. In end of the year 100 percentage female calves will be benefitted by this initiative.

FARMERS SUSTAINABLE LIVELIHOOD PROJECTS

Pashudhan : Fodder Cultivation

Village Gauchar land development for the fodder cultivation to made fodder sustain village & Avail green fodder in scarcity phase.

With the support of Gauchar Seva Samiti Grassland development in Siracha-40 Acre & Zarpara 165 Acre done which resulted in total production 82 ton.

Zarpara Gauchar Land Development will become the change maker model for other villages too. 165-acre land with Shorghum, Rajko, Maize, Zinzvo etc. different types of fodder due to this nutrition value of milk will be improved and average one liter milk quantity will be increased.
Average 2450 cattle get benefitted of green fodder for 65 days months which –which increase 0.5 litre milk quantity of 50% cattle
(1225 cattle x0.5 litre milk quantity Increase x 40 INR per litre = 1592000)

Apart that due to natural grazing Benefit save farmer cost to purchase Fodder .
(2450 cattle x 7kg /Day X 65 Days = Rs. 2786875

This Intervention could save Rs.4378875

Adani Foundation is planning to expand this model from 125 acre to 500 acre up to next year monsoon.

FISHERFOLK SUSTAINABLE LIVELIHOOD PROJECTS

❖ **Balwadi**

- Mental and Physical Cognitive Education with Joy full learning activities to 2.5- to 6-year-old children.
- Provide Nutritional Food Facilities.
- Capacity Building program for Balwadi teachers.

❖ **Vehicle Transportation Facilities**

Vehicle Transportation facilities to 25 school Going Children from Juan Bandar to Nearest Government School Education Kit Support
(Note Book , Guide, Etc) To Secondary and Higher secondary Fisherfolk students as Motivation

❖ Free education in Adani Vidya Mandir school.

❖ Due to This Efforts First generation of Fisherfolk Community get in the Main stream of education.

FISHERFOLK SUSTAINABLE LIVELIHOOD PROJECTS

- **Mangrove plantation** and Nursery development work has created a two facet impact by providing Livelihood to Fisherfolk during two months Fishing during Off season and developing **162** hector dense mangrove afforestation. **4430 Men days work** provide to 284 Fisherfolk of Luni ,Sekhdiya and Bhadreswar Villages.

- **Youth Employment :-** Adani Foundation is committed for youth employment with imparting technical and Non-Technical Training for Fisherfolk Youth and started Electrical ,Welder ad Masson work training under Adani Skill Development Centre.
  - **35** Youth get Employed in GPVC,AWL,MSPVL and KCL WinTech and Other CFS.
  - **194** - Fisherfolk men and women were supported with skilled and unskilled Job and Contract work in various APSEZ Department.
- **Government scheme** Awareness session was held in association with Fisheries department Bhuj to facilitate pagadiya fishermen by providing fishing kits to seven Fishermen. The coordination was made by Adani Foundation to process application.

FISHERFOLK SUSTAINABLE LIVELIHOOD PROJECTS

- Adani Foundation supports fisherfolk community by distributing Potable water to Luni, Bavdi and Randh Bandar on daily bases. Moreover Kutdi Zarpra, Vira bandar and Juna Bandar is also supported by Adani Foundation in association with Mundra Nagarpalika.

Sr. No	Vasaht name	Population	Quantity Of water
1	Luni Bandar	384	15000
2	Bavdi Bandar	476	20000
3	Ranbdh bandar	930	25000

WOMEN SUSTAINABLE LIVELIHOOD PROJECT

- Total 82 Active SHG Group – 834 women are engaged with Adani Foundation for Savings activity. Among 15 SHG groups are involved in income generation. We facilitate them capacity building training for quality, Marketing Finance and team work to made them self sustain.
- Saheli Swa Sahay Juth have completed order of 10,000 Sanitary pad from District Health Department.
- "Shradhha Saheli Sva sahay Juth" is won the tender to provide Catering service in Block level Government
- Tejasvini SHG has received order of 3000 traditional dress preparation worth 3.25 Lacks
- Sonal Saheli Women SHG had supplied 1000 KG washing powder to Adani port & Willmar.
- Meghdhanush Saheli group had opened a stall of eco friendly Ganpati and did sale of 55000 INR. They have also participated in "Sartha" Exhibition in which they did sale of 15000 INR.

WOMEN SUSTAINABLE LIVELIHOOD PROJECT

"Pragati" – 75 Stories of Empowered Women to Celebrate Azadi ka Amrut Mahotsav
Over the past two decades, Adani Foundation Mundra takes a privilege to showcase journey of women to uplift and encourage contribution in local business, services and small enterprises in nation building through this book.
The book was launched by Respected Chairman Sir Gautam Adani sir on 1st day of Auspicious Navratri Parv.

WOMEN SUSTAINABLE LIVELIHOOD PROJECT

Gram Bharti : Women Sustainable Livelihood Projects

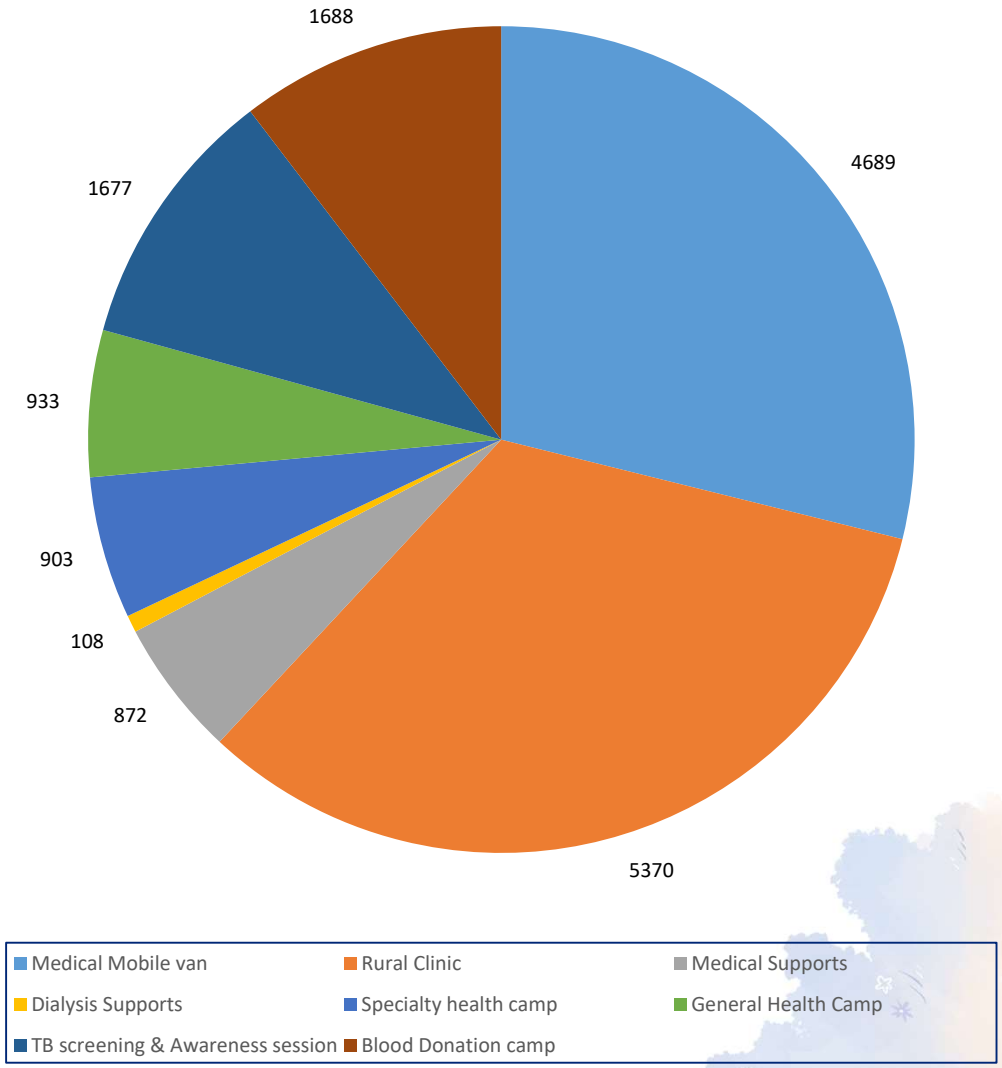
The SHG mela (exhibition cum sale) Gram Bharti, was planned between 26th to 28th September main reception lobby Adani Corporate House Ahmedabad. The inauguration session was on 26th September 2022 by Respected Chairman Gautam Adani sir with Mrs. Shilin Adani mam and Mr. Vasant Gadhavi sir.

From Mundra
Tejaswi Saheli SHG
Shraddha Saheli SHG
Pragpar Saheli SHG
Meghdhanush Saheli SHG
Radhe Saheli SHG
Umang Saheli SHG
Jyot Saheli SHG had participated with lots of enthusiasm and zeal.

Total Sale @ 3.2 Lacs with further order of Rs. 1.1 Lacs to Meghdhanush, Jyot and Pragpar Saheli Group.

COMMUNITY HEALTH

Health is the basic need for any individual and community Development considering various kind of Project are being executed as per the need and assessment to ensure good health for all citizen of Mundra villages. Like Mobile health van, Rural Clinics, support to dialysis patients and poor patients and health Camp Frequently and During disease outbreak.



COMMUNITY HEALTH

- The Adani Foundation runs Rural Clinic and Mobile health care Unit to render basic Medical Facilities to Interior Villages and Fishermen vasahat since 10 Year.
- Equipped with 94 types of general and life saving medicines with Potable ECG machine.
- **Rural Clinic**:- 09 Villages
  06 villages of Mundra block, 02 villages of Anjar block and 01 village of Mandvi block)
- **Mobile health care Unit:-** Covered 30 Villages.
- Total Patients Benefitted:- 10059.
- **Apart that Adani Foundation facilitates early diagnosis and screening for non communicable disease during MHCU & Rural clinic visit**

COMMUNITY HEALTH

Dialysis Support:-

Awareness camps are conducted in community for Prevention and Care against Kidney Stone followed by support for dialysis if more criticality is there. Patients are provided with dialysis support for months and years as per their needs and medical condition.

5 financially challenged patients has been supported with Dialysis treatment at 108 Times which added day in their Life.

Economically underprivileged Patients Support:-

Medical support is a service by foundation which includes, consultation, medicine, vaccination drives and immediate care to the needy patients **872** Patients from Mundra, Mandavi and Anjar Block are Benefitted at adani hospital.

National TB Elimination Programme (NTEP) aims to meet the ambitious goal, announced by the Honorable Prime Minister Shri. Narendra Modi, of ending the TB epidemic by 2025.

Adani foundation with APSEZ, APML, AWL and MSPVL HR department has started cluster based screening program to eliminate TB in labors under Dignity of workforce program. Adani Ports and SEZ Limited has initiated screening Total 3200 work force screened in first & Second phase with target of screening more than 10,000 workforce of all group businesses and SEZ Industries.

COMMUNITY HEALTH

Health camp

specialty camps , Eye checkup camps ,Blood donation camp, Anti-tobacco awareness camp, TB screening, and other are conducted in core villages as well as in labour colonies.

Specialty health(Gynec , Pediatric eye specialty health camp) :- 04 camp – 903 Patients.

General health camp :- 05 camp -1041 Patients

Awareness Session

1.Health & Hygiene for School Students- - 432 Students.

2. Malnourished Child and Adolescent Girl- 108 Child and Girls.

Blood Donation camp was held at various location on the Occasion of Respected Chairman sir's birthday on 24th June.

Total 590800 CC quantity of Blood had been donated by 1088 Employees.

Patients who are suspected with critical illness directed towards G.K General Hospital.

COMMUNITY INFRASTRUCTURE DEVELOPMENT

Adani Foundation has designed, planned and built a strong infrastructure to improve the Standard of Education, Health, Agriculture and Basic facilities for the betterment of Community.

All initiatives were fulfilled according to the official requests and demands of people of the community and the Gram Panchayat.

COMMUNITY INFRASTRUCTURE DEVELOPMENT

❖ **Work completed.**

1. Percolation well Recharging work at Bhadiya & Mota Kandgra village.
2. Sluice gate Construction to Control Flood during Flooding at Khoydivadi Vistar Bhujpur.
3. Pond Beatification and Bund Strengthening at Bhujpur village.
4. commissioning of Community Training Centre at Shekhadiya.
5. Two Pond Deepening at Zarpara under Amrut Sarovar Yojna.
6. JCB & Hitachi Machine Support for Pre-Moonson activities.
7. Repairing and Maintenance work of Approach at Luni, Bavdi and Navinal Fishermen Bandar.

❖ **Work in Progress.**

1. Development of Vegetable Market Development at Mundra with 128 Stall Work in Progress.
2. Pond Pipe Line Work at Pranshla vadi vistar Zarpara village.
3. Sluice gate Construction & Pipe line work to Control Flood during Flooding at Pranshlavadi Vistar Zarpara.
4. Check dam Restrengthening and Road restoration at Bharudiya village
5. Development of Cricket Ground at Hatdi Village.
6. Renovation and reaparing work Community Center , Mundra.
7. Renovation and Road reparing work at All Fishermen Vasahat.

ADANI SKILL DEVELOPMENT CENTRE

ASDC Bhuj - Total Centre Admissions FY 22 - 23

Courses	Female	Male	Total	Revenue Generated
Interview Skills	21	9	30	0
General Duty Assistant	21	7	28	1,93,714
Disaster Management	0	2	2	3,998
Basic Functional English	0	2	2	1,198
Beauty Therapist	2	0	2	3,998
Assistant Beauty Therapist	1	0	1	1,499
Self Employed Tailor	8	0	8	7,992
Digital Literacy	5	1	6	3,349
Domestic Data Entry Operator	0	1	1	4,720
Non Domain Employability Skills	21	8	29	0
Understanding Operating System	21	7	28	0
Entrepreneurship	23	7	30	20,800
Financial Literacy	45	1	46	0
Total	**168**	**45**	**213**	**2,41,268**

MOU with Kachchh District Education Office. In this MOU we will provide training of Digital Literacy and Basic Functional English in Kachchh District Schools. As per MOU Kachchh District Education Office will provide minimum 5000 candidates to us for training (Adani Skill Development Centre).

Courses	Total
Basic Functional English	1387
Digital Literacy	211
Total	**1598**

ADANI SKILL DEVELOPMENT CENTRE

Soft Launching of
Self Employed Tailor – Outreach Batch at Meghpar
Soft Launched Self-Employed Tailor Batch at Meghpar (Out-reach). Total 25 candidates are enrolled.

Soft Launch of General Duty Assistant Batch
Soft launched General Duty Assistant Batch with 30 candidates under DDU-GKY scheme as per instruction by GLPC.

Soft Launch of Entrepreneurship Development Program
Soft Launch of Entrepreneurship Development Program Training at Centre under CED with 30 candidates.

Soft Launch of FL Training under Special Project
Launching Special Project Jointly with KMVS NGO for FSW (Female Sex Worker) Financial Literacy training Inaugurated on 22-07-2022 Total 37 women participant

ADANI SKILL DEVELOPMENT CENTRE

ASDC Mundra

ASDC and Thermax Foundation Done MoU

- ASDC and Thermax Foundation Jointly Organised , Skill Development training program for " Dhrab Village youth"
- Today we have Inaugurated this training program at Dhrab Village . In 1st phase We are starting Domestic Data Entry Opertor training with 50 students (25 girls and 25 boys)
- Chief Guest of this program was Mr.Anees Shaikh- Head ,ER& Administration , Thermax,
- Ashlam bhai Turk- Dhrab Village Sarpanch
- Mavji Sir , Manhar Bhai & Deval Ben was presented from Adani Foundation.
- Mr. Jayesh was presented from Thermax Foundation.
- Mr. Sagar Kotak has done anchoring of this program.
- Mr.Praful Garoda has done all coordination of this program and setup the computer lab.
- Mr.Harshid and Raj also supported in this program.

Tie Ups with (Thermax Foundation, Empazer, Navin Group and DEO Kutch @ Rs.21.58 lacs.

Course Name	Total Admissions
Pedicurist and Manicurist	68
Self Employed Tailor	01
Assistant Electrician	30
Bar Bender and Steel Fixer	29
Meson General	29
Domestic Data Entry Operator	55
Junior Crane Operator	23
Interview Skills	32
Self Employed Tailor	30
Basic Functional English & Digital Literacy	1539
	1836

ADANI SKILL DEVELOPMENT CENTRE

ASDC Mundra

Success of completion of batch 1 of Pragati was celebrated today (29th April) at Adani House, Mundra in esteemed presence of Mr Vikram Tandon, Chief Human Resource Officer, Adani Group, Shri Vasant Gadhavi ,Executive Director, Adani Foundation and Mr Rakshit Shah, Executive Director, APSEZ. Other dignitaries who graced the occasion were Mr. Anil Kumar Kalaga, , Mr. Charles Douglas, CEO, Mundra and Tuna Ports, Jatin Trivedi, COO, Adani Skill Development Centre and all HR and Department heads of APSEZ, Power, Solar and Wilmar.

The event celebrated by distributing skill training certificate to 52 fisher folk students, who were trained under Mason and Assistant Electrician job roles under Adani Saksham. Event also included batch 2 launch ceremony by providing training kits to trainees.

All trainees got the privilege to meet Mr. Vikram Tandon and received words of encouragement and guidance from him for their bright future ahead. Highlight of the Project Pragati is All 52 students who underwent trainees got placed with decent income. This will transform not just their lives but also will gradually lead to socio economic shift in fisher folk community of Mundra, Kutch.

ADANI KANDLA BULK TERMINAL PVT LTD - TUNA

Fodder Support

Support of Dry & Green Fodder to Tuna and Rampar Village Gaushala Cattles during Scarcity which impacted on Cattle health and Milk Productivity ultimately Farmers Income as well. Total 643825 Kg green Fodder Supported for 900 Cattles of Tuna & Rampar.

Tree –Plantation

Total 200 Tree was planted and ensure responsibility for watering and Gurdning Public place and Schools Premises with involving Community and School students and sensitized to plant more trees and nurture.

Water at Fisherfolk settlement

Potable water (18 KL per Day) Distribution to Vira and Dhavlvaro Bandar through Water tanker Regularly which improve Hygiene and Health standard and reduce Women drudgery ,Cost and Time to get water by **Linkages through AKBTPL and GWIL daily bases.**

ADANI GREEN ENERGY LTD - ABDASA

Adani Solar Plant Bitta is under Adani Green Energy Limited. Adani Foundation is doing regular support of JCB during monsoon or any accident cases as and when required.

Apart from it Celebrated Chairperson's Birthday by distribution of school bags to the children taking admission in class 1 along with necessary books and Education Material. Which includes Bitta School, Nani Dhufi School and Moti Dhufi School.

SUPOSHAN

fortune Suposhan

A CSR initiative by Adani Wilmar Ltd.

SUPOSHAN

Activities	Beneficiary
Family counselling	1728
Anthropometry	4644
Focus Group Discussion	535
Cooking demo	43
Poshan Vatika	165
Plantation (Moringa, Papaya, Lemon etc.)	220
CMTC / NRC admission	04
CMTC / NRC discharge	04
New Pregnant women identified	148
Newborn Identified	114
No. of WASH Kit Distributed	03
Village level Events	68
No of Sanginis	23

SUCCESS STORY

Amrutaben desired to ask God for one thing, a new pushcart ! - Mundra

Jiluben is an elderly woman with physical limitations and a terrible economic state. She's been widowed for thirty years. Jiluben's son is 50 years old, unmarried and almost face continuously ill. while her daughter Amrutaben is divorced (she got married 20 years ago). Jiluben, who is 70 years old only has her daughter Amrutaben is working. Amrutaben used to use her old pushcart but it was heavy and too old for her to carry around everywhere, plus she didn't have enough money to buy a new one. Amrutaben only desired to ask God for one thing, a new pushcart ! because everything else she could take care of on her own despite such bad situation.

An employee of the Adani foundation have spoken with Sarpanch Hawaben about the work being done by the Foundation on support of people with disabilities. As soon as she informed & requested that to make visit at Jiluben house. Their pushcart needs were discussed by representative from the visited, verified all the necessary paperwork, and spoke with Jiluben and her family about government programs for widows and people with disabilities. And a week later the entire process was completed and the new pushcart was provided to them. She is now able to work promptly and help their family in overcoming this difficulty.

SUCCESS STORY

Only a teacher can turn the disability into a talent ! - Mundra

Challenges are what make life interesting. Overcoming them is what makes life meaningful". Halepotra sadiya studying in class 4 of Dhrub primary school is the SEN - special education needed .she is not able to see clearly through her eyes that is having the problem of vision by birth , she underwent 4 operations but have a great IQ level which never stopped her from learning new things. sadiya's parents never stopped her coming to school. she had a problem in basic maths ,gujarati reading and writing but within an year she worked continuously during her free time and now is able to read write and perform basic calculation. Her favourite hobby is learning new things , colouring and listening new rhymes from YouTube. she can now stand up in morning assembly and give her introduction in English . "only a teacher can turn the disability into a talent through hard work and self confidence". Her dream is to become a teacher.

SUCCESS STORY

Journey of Transformation in the Lives of Umarpada Tribal Women - Hazira

Umarpada is a Town and Taluka in Surat District of Gujarat. According to census 2011 there are 17,338 houses and 83,723 people living in the taluka. In terms of literacy, 58.56% of people in Umarpada Taluka are educated. From 2022 to 2023, the Adani Foundation's Hazira unit begin its CSR efforts in the Umarpada block as part of the Tribal Development Initiative. empowerment of women is One of the most significant aspects of this project. In Ghanawad village, most of the women used to do household work and often went into the forest and nearby villages for agriculture related work. They labour 8 to 10 hours and actually earn between Rs. 100 and Rs.130. This group, which is entirely made up of tribal people, also includes one of the oldest still-existing primitive tribes, the Kotwadiya community. Due to the majority of their hours being spent at work, they are unable to emphasise on the health and education of their child.

Ten potential SHGs have been uncovered by AF Hazira Team. A group of women were encountered and trained by the AF Hazira staff. In the initial batch, 35 tribal women were Trained in the production of papad, pickles, and masala. These women thought they could manage this business unit after ten days of training. With the help of the hygienic standards they have begun preparing pickles and papads in their own kitchens. They have partnerships with Surat-based businesses to supply their items to their canteen as well as local markets where they sell their products. They have a fixed source of additional income. They gather around and talk about one other's challenges in order to discover solutions as a group. The other villager's women have looked up to this group of women as a role model.

SUCCESS STORY

Impact of silage in Income of Maheshbhai - Dahej

Maheshbhai Haribhai Ahir lives in the Atali village of Dahej Taluka with his family. His primary source of income comes from the production and distribution of milk. His family has owned 3 cows and 23 buffaloes in addition to 5 acres of agricultural land. Twenty buffalos and two cows are currently lactating. This is the second generation of the family working in animal husbandry. In the summer, they suffer from a lack of green fodder due to irrigation systems being insufficient. There is plenty of green animal feed available during the rainy season. In order to produce milk, green feed is crucial.

Adani Foundation held farmer meetings in the village of Atali on January 18, 2012. Give details about making silage for animal feeding at this meeting. Making silage would solve the problem of summer time green fodder shortage. Maheshbhai received 10 50kg silage bags in March 2022. Silage feeding increased milk production by 2 litres per day (from current milk production 6 litres). In just 60 days, milk production has increased by a total of 120 litres, and income has increased by a total of Rs. 7200. Production of milk increased by 480 litres from the following year to 300 litres in 2021.

SUCCESS STORY

health care service is to save the lives !

Mohammad Sadik Turk, 16, of Dhrub arrived in critical condition because of pain in the area of his kidneys. The condition was treated as an intestinal problem by doctors. The specialists tried their best to treat him & offering variety of medications. Support him for his routine dialysis for six to eight months while paying attention to his condition. He no longer needs dialysis after complete therapy, but he still needs to regularly administer injections three times every month.

Many young children pass away each year from insufficient medical care and inability to pay for necessary treatments. As long as there is only one source of income for the family and everyone depends on him, it is hard to provide costs for those who are living below the poverty line. Although India has more than 50,000 patients who receive long term dialysis, it has only a thousand kidney specialists in the entire country. Furthermore, treatment can be expensive. In situation like this Foundation pays for the child's injections in light of his financial situation and wishes him a quick recovery and a long and healthy life. The main goal of the Adani Foundation's community health care service is to save the lives of children like Sadik.

SUCCESS STORY

Hope and Faith from the Mobile health Unit Justify!

Jorubha Bapubha Jadeja, age 70 of Hatadi village has been suffering severe weakness. He was short of Money and means of transportation to go to the hospital. thereafter waits for the Adani Foundation's mobile health care unit to arrive. A foundation initiative to provide primary facility at door by the mobile health care unit. Since everyone in the village is aware of this, they regularly choose to come here for primary health problems. After giving them basic care, transfer them to a hospital facility if required, and if not, doctors follow up with them until they recovered. Jorubha anticipated the arrival of the Mobile Unit of the Foundation in his village because he was unable to get to the hospital & he has faith in Mobile unit as he has earlier recovered from illness without visiting a hospital.

The prospect of meeting with a doctor gave them hope for improvement in his health. His health had become a little worse since it had been a few days. Jorubha entered worth of headache, nausea, and vomiting symptoms. His blood pressure was 168/90 mmHg at the moment, so he needed symptomatic and other necessary treatment. Along with medication, the doctor encourages him to take care of himself by avoiding unhealthy food that is fried or oily, applying salt sparingly, and engaging in light activity like walking. yoga. Doctor take ongoing telephone follow-up with Jorubha & providing them with the information they wanted. The mobile health unit returned on Friday to check blood pressure once more; it was 155/85mmHg. then Antihypertensive medication was started. Blood pressure is periodically checked every Friday and is continuously monitored after 20 days when it enters the usual range of 123/80 mmHg. Jorubha was delighted when he saw how much the doctor cared like his son and also how his health had improved. The Adani Foundation received blessing from him.

SUCCESS STORY

Suf Handicraft : Conserving "VIRASAT" of Decades

Parvati Ben's earliest memory of stitching delicate handicrafts is from when she was as little as 5-years-old. Since then, she has followed this art with an immense dedication that shows through her intricate and precise handiwork. Parvati is a resident of Pragpar-2 village. She lives in a house with 5 other people and is the sole breadwinner. Even so, Parvati is a humble, loving and welcoming individual.

Parvati Ben had been practising her intricate Suf handicraft all along, making scarves, table cloths, garments and more for her fellow villagers and the occasional visitors. Her artwork had consistently been worth more than what she sold it for- her only desire being that her art finds an expression, a space in the world, however small it may be. One day, Adani Foundation discovered this diligent, rigorous woman. Parvati Ben now works on projects brought to her by Adani Foundation and is hence able to sustain her entire family on her own. She has risen to be an aspirational figure, looked upon as a role model by her fellow village women. Parvati Ben is playing a major role in now setting up a federation for the village women across Mundra district to practise their handicraft work and earn a livelihood. But more than all the titles and positions, what Parvati Ben deems sacred is the sheer recognition of her art. All she ever wanted was to be known as an artist and now she is the voice of this very own art, inspiring dozens of women like her to become independent.

EVENTS

Support of Biogas kits on Earth Day

Participation Krishi Mela in presence of Central Agricultural minister

Utthan students prepared cards on Mother's Day

World Health Day celebrated by creating health awareness programs and schools and at Adani wilmar.

No Tobacco day celebrated by creating awareness to take preventive measures for workforce

Tree plantation at Zarpara village on 'Word Environment Day' in presence of SDM

International coastal clean-up day was celebrated in association with National Coast Guard department at mandavi with Cleanliness Drive.

The International Mangrove Day for the Conservation of the Mangrove Ecosystem is celebrated every year on **26th July**,

Teacher Day Celebration on 5th September in all Utthan School.

AWARDS

Adani Foundation received Diamond Award in participatory ground water management organized by Quality circle forum of India - QCFI

Jyoti ben tank received Award from Vice Precident in Amazing Indians Awards who is member of Prakrutik Sahkari Mandali supported by Adani Foundation which is matter of Proud

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નાયબ પશુપાલન નિયામકશ્રીની કચેરી,
પશુપાલન સંકુલ, જિલ્લા પ્રસાશન કચ્છ ભુજ - 370001

આભાર સહ અભિનંદન પત્ર

વિષય : કચ્છ જિલ્લામાં ગોવંશમાં ફેલાયેલા લમ્પી સ્કીન ડીસીઝ સામેનાં નિયંત્રણ માટે આપના તરફથી મળેલ ઉમદા સહકાર માટે.

Received appreciation letter from District Animal Welfare Departent for commendable work for Cattles affected by Lumpy Virus

PRESS NOTE

અદાણી ફાઉન્ડેશન દ્વારા સ્વતંત્રતા દિવસે ૧૭ શાળાઓમાં સ્પોર્ટસ અને મ્યુઝિક કીટનું વિતરણ

અદાણી ફાઉન્ડેશન આઈસીડીએસ અને ઈન્નરવ્હીલ કલબ ઓફ મુંદરાના સંયુક્ત ઉપક્રમે મહિલા દિવસની અનોખી ઉજવણી

તુર્ક મેડીકલ ટ્રસ્ટ ધ્રબ

જળસંરક્ષણ ક્ષેત્રે અસામાન્ય કામગીરી બદલ સન્માન

અદાણી ફાઉન્ડેશનને જળશક્તિ મંત્રાલય તરફથી એવોર્ડ એનાયત

ભાસ્કર ન્યૂઝ | મુન્દ્રા

સમગ્ર જિલ્લામાં જળ સંરક્ષણ ક્ષેત્રે ઉત્કૃષ્ઠ કામગીરી બદલ અદાણી ફાઉન્ડેશન ને જળશક્તિ મંત્રાલય તરફથી એવોર્ડ વડે સન્માનિત કરાયું હતુ.

29 માર્ચ 2022 ના રોજ નવી દિલ્હી સ્થિત પ્લેનરી હોલ ખાતે રાષ્ટ્રપતિ રામનાથ કોવિંદ ફૂડ પ્રોસેસીંગ ઉદ્યોગ ના રાજ્યકક્ષા ના મંત્રી ગજેન્દ્રસિંહ શેખાવત અને આદિ જાતિ બાબતોના મંત્રી બિશ્વેશ્વર ટુડુ ની ઉપસ્થતિમાં યોજાયેલ ત્રીજા નેશનલ વોટર

માં સ્વજલ પ્રોજેક્ટ અંતર્ગત રૂફટોપ રેઈન વોટર ના 115 યુનિટ સ્થાપિત કર્યા છે.31 કુવા 189 બોરવેલ રિચાર્જ ઉપરાંત 56 તળાવો ઉંડા

બાળકો ને અસર કરતા પાણી સંરક્ષણ ની દિશા માં કામ કર્યું છે.જેના પરિણામે ભૂગર્ભ જળના ટીડીએસ માં 19.6 ટકા નો ઘટાડો

મુન્દ્રાના 7 ગામના 51 ખેડૂતોએ ગાય આધારિત ખેતી અપનાવી

અદાણી ફાઉન્ડેશન 5000 જેટલા કિસાનોને પ્રોત્સાહિત કરશે

ભાસ્કર ન્યૂઝ . મુન્દ્રા

આધુનિક યુગ માં રસાયણિક ખાતરમુક્ત આહાર મેળવવો એ માનવમાત્ર માટે પડકારરૂપ બન્યું છે ત્યારે મુન્દ્રા પંથકના સાત ગામના 51 ખેડૂતોએ ગાય આધારિત ખેતીનો પ્રારંભ કરી નવો રાહ ચીંધ્યો છે.

ખેડૂતો પોતાના આંગણે બે પ્રકારના ખાતરો ઉત્પન્ન કરી ગાય આધારિત ખેતી કરી શકે તે માટે સતત પ્રયત્નશીલ અદાણી ફાઉન્ડેશન દ્વારા એક દેશી ગાયથી 30 એકર જમીનમાં જીવામૃત ખેતી કરી શકાય જ્યારે સજીવ ખેતીમાં 30 ગાયોથી એક એકર માં પાક ઉગાડી શકાય તે અંગેની સમજ આપતાં ભૂમિપુત્રોને તે અંગેની રીતથી અવગત કર્યા હતા. હાલ અદાણી ગ્રુપના સહયોગ થી કિસાનોને ત્યાં મોડેલ ફાર્મ બનાવી ગાય આધારિત ખેતી શરૂ કરવામાં આવી છે અને આ પ્રોજેક્ટનો વિસ્તાર કરવા

મુંદરા પોર્ટની અદાણી વિલમાર કંપનીમાં વિશ્વ મેલેરિયા દિવસની ઉજવણી કરાઈ

મેલેરિયા કેવી રીતે ફેલાય છે?

મેલેરિયા અટકાવવા માટે શું કરવું જોઈએ

સાવચેતીઓ મેલેરિયા સામે રક્ષણ આપશે

કચ્છમિત્ર

વિશ્વ મેલેરિયા દિવસ ઉજવણીએ મુંદ્રા પોર્ટ ખાતે યોજાયેલા કેમ્પમાં ઉપસ્થિતોને માહિતી આપતા અગ્રણીઓ.

વાહકજન્ય રોગો અંગે સમજ આપી સંપૂર્ણ સારવાર પર ભાર મુકાયો

મુંદ્રા પોર્ટ ખાતે વિશ્વ મેલેરિયા દિવસ ઉજવણીએ જનરલ આરોગ્ય નિદાન કેમ્પ યોજાયો

મુન્દ્રામાં સક્ષમ દ્વારા રોજગારીની તરકો વધારતા માછીમાર યુવાનો

પ્રગતિની બેચ-૧ પૂર્ણ અને બેચ-૨નો પ્રારંભ કરવામાં આવ્યો

કચ્છ પત્રિકા

મુંદ્રામાં હોમ બાયોગેસ કીટનું વિતરણ કરી 'વર્લ્ડ અર્થ ડે' ઉજવાયો

'અર્થ ડે'ને સાર્થક કરતુ અદાણી ફાઉન્ડેશનનું સરાહનીય કદમ!

મુંદ્રા મધ્યે આયોજીત નેત્ર નિદાન કેમ્પમાં ૭૦ દર્દી

लोकतेज
epaper.loktej.com
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अदाणी फाउंडेशन द्वारा नियोजित उड़ान परियोजना के तहत

अदाणी हजीरा पोर्ट के शैक्षिक दौरे पर सूरत के छात्र

लोकतेज, सूरत। अदाणी समूह की सामाजिक विकास गतिविधियों के लिए अदाणी फाउंडेशन ने उड़ान प्रोजेक्ट अंतर्गत गुजरात के स्कूल कॉलेजों के छात्रों को गुजरात में संचालित अदाणी समूह के औद्योगिक प्रतिष्ठानों में

उपलब्ध सुविधाओं के स्वयं गुणवत्ता अध्ययन के लिए गुजरात सरकार के साथ समझौता ज्ञापन किया हुआ। इस प्रेरित होकर उड़ान प्रोजेक्ट ने अदानी फाउंडेशन की शुरुआत की है।

उड़ान परियोजना मार्च 2020 से कोविड-19 के कारण स्थगित कर दी गई थी जो अब फिर से शुरू हो गई है। उड़ान प्रोजेक्ट के तहत राज्य की पहली महिला विश्वविद्यालय वनिता विश्राम की 50 बीबीए छात्राओं ने अदाणी हजीरा पोर्ट का दौरा किया और यहां किए जा रहे कार्यों से दौरा किया और खाद्य तेल बनाने की प्रक्रिया को देखा। एक दिवसीय यात्रा के दौरान, छात्र जहाज को बंदरगाह और उससे जुड़ी व्यावसायिक गतिविधियों के साथ-साथ अदानी-विल्मर संयंत्र में खाद्य तेल के उत्पादन और वितरण को देखकर प्रसन्न हुए और कहा कि यह उनका पहला अनुभव था। उड़ान के दूसरे दिन, सोनगढ़ तालुका के आदिवासी इलाके में उकाई के

કલ્પતરુ પ્રોજેક્ટ હેઠળ ૫૦ લાખ વૃક્ષોનું વાવેતર કરવાનું લક્ષ્ય

બોરાણામાં મુન્દ્રાની બ્રહ્માકુમારીઝ સંસ્થા દ્વારા ૧૧૦૦ રોપાંઓનું વાવેતર

। મુન્દ્રા । (સંદેશ બ્યૂરો)

મુન્દ્રા પ્રજાપિતા બ્રહ્માકુમારી ઈશ્વરીય વિશ્વવિદ્યાલય તેમજ અદાણી ફાઉન્ડેશનના સંયુક્ત ઉપક્રમે અદાણી ફાઉન્ડેશનના ચેરમેન ડૉ. પ્રીતિબેન અદાણીના ૫૮મા જન્મદિવસ નિમિત્તે બોરાણા ગામે વિસ્તરી માતાજી મંદિરના પરિસરમાં વૃક્ષારોપણ કાર્યક્રમનું આયોજન કરવામાં આવ્યું હતું. જેમાં મુન્દ્રા સેવા કેન્દ્રના ૫૦ જેટલા ભાઈ-બહેનોએ પરમાત્માની મધુર સ્મૃતિમાં ૧૧૦૦ જેટલા અલગ અલગ પ્રકારના રોપાંઓનું વાવેતર કર્યું હતું.

બ્રહ્માકુમારીઝ વિશ્વ વિદ્યાલય દ્વારા કલ્પતરુ પ્રોજેક્ટ હેઠળ ઓછામાં ઓછા ૫૦ લાખ વૃક્ષો વાવવાનો લક્ષ્યાંક નક્કી

કરવામાં આવેલ છે ત્યારે મુન્દ્રા સેવા કેન્દ્રના મુખ્ય સંચાલિકા રાજયોગિની બ્રહ્માકુમારી સુશીલાબેને આ આનંદના પ્રસંગે જીવનમાં પર્યાવરણના મહત્ત્વ પર પ્રકાશ પાડ્યો હતો. પ્રોજેક્ટ ઓફિસર કરસન ગઢવીએ સહયોગ આપી કાર્યક્રમને સફળ બનાવ્યો હતો.

કચ્છની ૫૯ શાળાઓમાં 'ઇકો ફ્રેન્ડલી' રક્ષાબંધનની ઉજવણી

અદાણી ફાઉન્ડેશન પ્રકલ્પ ઉત્થાન પ્રોજેક્ટ અંતર્ગત વિવિધ દિવસોનો કરવામાં આવતી અનોખી રીતે ઉજવણી

। કચ્છ આજકાલ । ભુજ

ભારત તહેવારોનો દેશ છે. તેમાં અનેક તહેવારોની ઉજવણી થાય છે. આપણે ધાર્મિક, સામાજિક અને રાષ્ટ્રીય તહેવારો ઉજવીએ છીએ. તેમાં રક્ષાબંધન એ ભાઈ-બહેનનો ખુબ મહત્વનો તહેવાર માનવામાં આવે છે. અદાણી ફાઉન્ડેશન દ્વારા પ્રાથમિક શિક્ષણમાં ચાલતા ઉત્થાન પ્રોજેક્ટ અંતર્ગત પણ વિવિધ દિવસોનો અનોખી રીતે ઉજવણી કરવામાં આવે છે. આ વખતે ઉત્થાન શાળાઓમાં 'ઇકો ફ્રેન્ડલી' રક્ષાબંધનની ઉજવણી કરવાનું નક્કી કરવામાં આવ્યું હતું.

ઉત્થાનનાં વિદ્યાર્થીઓ રાખડીઓ તૈયાર કરીને એક છોડને બાંધીને તેનું આખા વર્ષ દરમિયાન તેની કાળજી લેશે તેવો સંકલ્પ લીધો હતો. જેમાં રક્ષાબંધન પ્રકૃતિની, પ્રકૃતિ દ્વારા અને પ્રકૃતિ માટે થીમ અંતર્ગત આયોજન કરવામાં આવ્યું હતું. મનુષ્ય જન્મે ત્યારથી તેને કોઈને કોઈ પ્રકારનો ભય તો રહેતો જ હોય છે, અને જ્યાં ભય હોય ત્યાં રક્ષા સ્વયંભુ પ્રગટ થતી હોય છે. પ્રકૃતિ થકી આપણે છીએ અને તે હશે તો જ આપણે રહીશું તેથી તેની રક્ષા કરવી એ આપણી જવાબદારી છે. તે મુલ્ય બાળપણમાંથી જ વિકસે તે ખુબ જ અગત્યનું છે. શું રાખડી બાંધીને કોઈની રક્ષા ખરેખર થઈ શકે ખરી ? એ પ્રશ્નનો જવાબ આ રીતે રક્ષાબંધન ઉજવાય તો આપો આપ જ મળી જાય તેમ છે. ઉત્થાન પ્રોજેક્ટ અંતર્ગત બાળકોને વિવિધ ઉજવણી દ્વારા તહેવારો વિશે જાણવામાં ઉત્સાહ જાગે, શાળામાં આવી ઉજવણી થાય તો શિક્ષણમાં રસ જાગે અને શાળાનું વાતાવરણ ધમધમતું અને બાળકને ગમતું બને તે હેતુથી ઉજવણી કરવામાં આવી હતી. ઉત્થાન સહાયકોના માર્ગદર્શનમાં બાળકોએ 'ઇકો ફ્રેન્ડલી' રાખડીઓ બનાવવામાં આવી હતી. બાળકો પોતે સંપૂર્ણ રીતે તેમાં જોડાય અને તે પોતે રાખડી બનાવે તો તેનું મહત્વ ખુબ જ વધી જાય છે. બાળકનાં આવી પ્રવૃતિઓમાં જોડાવાથી તેમની વિચારશીલતા, સર્જનાત્મકતા અને સંવેદનશીલતા જેવા જરૂરી ગુણો વિકસે છે.

અદાણી ફાઉન્ડેશન ચોમાસામાં ટપકતી છત નીચે રહેતી આદિવાસી કન્યાઓની વ્હારે આવ્યું

અદાણી ફાઉન્ડેશન દ્વારા હજીરા વિસ્તારમાં ત્રણ મીઠા પાણીના તળાવો તૈયાર કરવામાં આવ્યાં

અકસ્માત નિવારણ માટે રેલીંગ, વૃક્ષારોપણ સહિત અનેક લોકોપયોગી કાર્યો થઈ રહ્યાં છે

અદાણી ફાઉન્ડેશને નેત્રંગ તાલુકાના અંતરિયાળ વિસ્તારમાં પુસ્તકાલયની સ્થાપના કરી

ખબરદાર પ્રતિનિધિ, વાગરા, તા. ૦૯

ગ્રામીણ વિસ્તારમાં સ્પર્ધાત્મક પરીક્ષાઓની તૈયારી કરતાં યુવાનોને ઘર આંગણે સુવિધા મળે એ આશયથી અદાણી ફાઉન્ડેશન, દહેજ દ્વારા ભરૂચના અંતરિયાળ થવા ગામમાં સંપૂર્ણ સુવિધાયુક્ત લાઈબ્રેરીની સ્થાપના કરી હતી. જેનું ઉદઘાટન હજીરા અને દહેજ અદાણી પોર્ટના સીઈઓ અનિલ કિશોર સિંહના હસ્તે સ્થાનિક આગેવાનોની હાજરીમાં કર્યું હતુ.નેત્રંગ તાલુકાના થવા અને આસપાસના ગામોના ૧૦૦થી વધુ વિદ્યાર્થીઓ સ્પર્ધાત્મક પરીક્ષામાં ભાગ લેતા હોય છે.પરંતુ આર્થિક સ્થિતિ અને વાંચન સામગ્રીની સુવિધાના અભાવે પરીક્ષાઓમાં ઉત્તમ પ્રદર્શન કરી શકતા ન હતા.જે બાબત ને ધ્યાને લઈ અદાણી ફાઉન્ડેશન દ્વારા સુવિધા સજ્જ લાયબ્રેરી

(તસવીર : ઝફર ગડીમલ)

બનાવવાનું નક્કી કરાયુ હતુ.ગામડાઓનું યુવાધન સ્પર્ધાત્મક પરીક્ષા ની તૈયારી સુપેરે કરી શકે એ માટે સંદર્ભ સાહિત્ય સાથે ની પુસ્તકાલયમાં ગુજરાતી,હિન્દી અને અંગ્રેજી ના પુસ્તકો ઉપલબ્ધ કરાવાયા છે.જેમાં અભ્યાસક્રમ ના પુસ્તકો ઉપરાંત જનરલ નોલેજ,મહાન વ્યક્તિઓના જીવનચરિત્ર, નવલકથાઓ અને અખબારો નો સમાવેશ કરાયો હતો.આજના લોકાર્પણ કાર્યક્રમ દરમિયાન અદાણી ફાઉન્ડેશન,દહેજ દ્વારા પુસ્તકાલયમાં વધુ પુસ્તકોની સાથે સમયાંતરે વિષય નિષ્ણાત વક્તા અને સલાહકારોની શિબિરનું પણ આયોજન કરવામાં આવશે ની જાહેરાત કરવામાં આવી હતી.અદાણી ફાઉન્ડેશનો ઉદ્દેશ્ય પરીક્ષાઓ પાસ કરનારા વિદ્યાર્થીઓને મદદરુપ થવાની સાથે સામાજિક સ્તર ઊંચું લાવવાનો છે.

Annexure – 4

AHMPL

DISTROMED KUTCHH SERVICES PVT. LTD.

MONTH : Sep-22

Date	Challan No.	BMW WASTE CATEGORIES				Total Kg.	Sign.
		Category Yellow Yellow Bag	Category Red Red Bag	Category Blue Blue Bag/*C.B.	Category White *PPC		
1							
2	8-7-8807	22,208	15,622	8,500	0,800	47.130	cp
3							
4							
5	8-7-89	22.200	18.080	11.920	0.500	51.800	cp
6							
7	8-7-9037	20.200	13.500	9.800	0.600	44.100	cp
8							
9	8-7-9146	15.600	13.200	6.080	0.500	35.380	cp
10							
11							
12	8-7-9263	33.500	16.800	15.600	0.600	66.500	cp
13							
14	8-7-9363	16.500	11.200	4.500	0.500	32.700	cp
15							
16	8-7-9483	15.200	11.200	9.080	0.300	35.780	cp
17							
18							
19	8-7-9603	33.600	15.600	17.500	1.800	68.500	cp
20							
21	8-7-9713	9.500	8.800	5800	0.800	24.900	cp
22							
23	8-7-9821	17,000	13,500	5,200	0,500	36,200	cp
24							
25							
26	8-7-9934	17.800	13.200	11.500	0.350	42.850	cp
27							
28	8-7-10036	15.200	12,200	5.200	1,500	34.100	cp
29							
30	8-7-10156	11.500	12.200	9.500	0.600	33.800	cp
31							
	Toteel	250.008	175.102	119.28	9.35	553.74	

*PPC : Puncture Proof Container

*C.B. : Cardboard Box

Annexure – 5

BMW AUTHORIZATION FORM-III(Rule 10)

Adani Hospitals Mundra Pvt Limited (387293)

Gujarat Pollution Control Board
Paryavaran Bhavan, Sector-10/A,
Gandhinagar - 382010
Tele :23222756

Under the Rule-10 of the Biomedical waste (Management and Handling) Rules, 2016 framed under the EPACT'86

Authorization for operating a facility for **Collection,Generation,Segregation,Storage** of biomedical wastes.

BMW AUTH NO :BMW-361121, VALID UPTO : 03/06/2027

PCB Id : 88120
BMW Id : 387293

Application Inward No : 87717 , Date: 10/05/2022

CCA No: BAWH-120894 (03/06/2027)

File No : KTCH-266,

No of Beds : 110, **Investment(in lakh) : 535.00,** **Act : B,A,W,H**
No of H.W : 1, **Water Consumption(klpd) : 25.00,** **Scale : M**

In exercise of power conferred by this Board and after scrutiny of above referred application, Superintendent / Incharge **of Adani Hospitals Mundra Pvt Limited at NEAR SAMUDRA COLONY,MUNDRA MPSEZ , MUNDRA MPSEZ Tal : Mundra Dist : Kutch East** is here by granted an Authorisation to operate Health Care facility for **Collection,Generation,Segregation,Storage** of biomedical wastes on the premises of **M/S. Distromed Kutchh Services Pvt. Ltd.** situated at **Survey No- 42/1/1,Kodki road, Ratia. Dist : KUTCHH** Under **CBWTF Reg. No : KTH-379, Valid Upto :**

1.The Authorisation is granted for **110** nos. of beds with generation of

Type of Waste Category (Kgs/Month)	YELLOW	WHITE (Translucent)	RED	BLUE
Qty permitted for Handling	500.00	20.00	300.00	300.00

category of biomedical wastes. **(Unit - Kgs/Month)**

2.This BMW Authorisation shall be in force **for a period of (5 year, Valid Upto 03/06/2027)**
This CCA Authorisation shall be in force **for a period of 5 year[up to 03/06/2027]**

3.This Authorisation is subject to the conditions stated in the Annexure-I attached here with and to such other conditions as may be specified in the Rules for the time being in force under the Environment (Protection) Act 1986.

4. The authorization shall comply with the provisions of the Environment (Protection) Act, 1986 and the rules made there under.

5. The authorization or its renewal shall be produced for inspection at the request of an officer authorised by the prescribed authority.

6. The person authorised shall not rent, lend, sell, transfer or otherwise transport the biomedical waste without obtainig prior permission of the prescribed authority.

7. Any unauthorised changes in personnel, equipment or working conditions as mentioned in the application by the person authorised shall constitute a breach of his authorisation.

8. It is the duty of the authorised person to take prior permission of the prescribed authority to close down the fecility and such other terms and conditions may be stipulated by the prescribed authority.

For & On behalf of
Gujarat Pollution Control Board

Grant date: 20/08/2022 16:31:02

BMW Head: Kutch East

TPAV # KQGUYNAR5S

Remark: Renewal authorization granted

Specific Condition :• Applicant shall have to comply with Standards for Treatment and Disposal of Bio-Medical wastes prescribed in Schedule-II of the Bio-Medical Waste Management Rules, 2016.

• HCF Shall either discharge domestic effluent in to terminal STP of Samudra Township only or provide STP at health care facility and operate it regularly and efficiently.

Encl.: Annexure-I

Issued to , Dr.G rao, Adani Hospitals Mundra Pvt Limited, NEAR SAMUDRA COLONY, MUNDRA MPSEZ , MUNDRA MPSEZ Tal :Mundra Dist :Kutch East (BMW Id: 387293)

Copy to Regional Office - Kutch East/ H.O
With a request to carry out periodically monitoring of above said hospital/clinic and submit the visit report to this Office.

Annexure – 6

GPCB

GUJARAT POLLUTION CONTROL BOARD

PARYAVARAN BHAVAN, SECTOR 10-A,
GANDHINAGAR - 382010,
(T) 079-23232152

By R.P.A.D

In exercise of the power conferred under section-25 of the Water (Prevention and Control of Pollution) Act-1974, under section-21 of the Air (Prevention and Control of Pollution)-1981 and Authorization under rule 6(2) of the Hazardous and Other Waste (Management and Transboundary) Rules, 2016 framed under the Environmental (Protection) Act-1986

And whereas Board has received consolidated consent application **inward No.259977** dated **27/07/2022** for the **Renewal of Consolidated Consent and Authorization (CC&A)** of this Board under the provisions / rules of the aforesaid Acts. Consents & Authorization are hereby granted as under:

CONSENTS AND AUTHORISATION:
(Under the provisions /rules of the aforesaid environmental acts)

To,
M/s. Adani Mundra SEZ Infrastructure Pvt. Ltd., (ID-10602)
Survey no. 141 (Part),
Vill: Mundra,
Tal: Mundra,
Dist: Kutch – 370 421

1. **Consent Order No. AWH-121264 Date of issue: 06/09/2022.**
2. The consents shall be **valid upto 02/09/2027** for the use of outlet for the discharge of trade effluent and emission due to operation of STP of Samudra Township (cap: 2.5 MLD), in the nearby SEZ at Survey no. 141 (Part), Vill: Mundra, Dist: Kutch for.
   1. Reception, treatment & disposal of effluent (1 MLD) sewage through underground pipeline from Mundra town to Samudra Township STP for treatment & ultimate disposal.
   2. Reception of primary treated effluent (25 KLD) from Adani Multispecialty Hospital, to STP Samudra Township for treatment & conveyance of treated sewage (150 KLD) to Adani Multispecialty Hospital.
   3. For the use of outlet for discharge of trade effluent & emission due to operation of STP of Samudra Township (Cap: 2.5 MLD) located at nearby SEZ at Survey no. 141 (Part), Vill: Mundra, Dist: Kutch.

Subject to specific condition:

1. Industry shall comply with all conditions of Environment Clearance granted to APSEZ by MoEF & CC vide order no. 10-138/2008-IA.III dated 15/07/2014.
2. Unit shall obtain fresh water from valid source having permission of the competent authority.
3. Industry shall not withdrawal ground water without prior NOC of CGWA as per order of Hon. National Green Tribunal order.
4. Industry shall comply with circular of the Board dated 27/08/2021 regarding retrofitting of emission control/ equipment in D.G. Set of capacity 125 KVA and above as per system & procedure for emission compliance testing of Retrofit Emission Control

Devices (RECD) for D.G. Set issued by CPCB dated 01/02/2022 at the earliest and submit compliance.

5. Industry shall manage Solid Wastes generated from industrial activities as per Solid Waste Management Rules-2016 (solid waste as defined in Rule-3(46)).

3. CONDITIONS UNDER THE WATER ACT:

3.1. Source of Water: Desalination Plant of APSEZ & GWIL.

3.2. The total quantity of sewage received at STP shall not exceed 2.5 MLD.

3.3. The total quantity of sewage generation shall not exceed 1475 KLD.

3.4. The total quantity of sewage received from Mundra town shall not exceed 1 MLD.

3.5. The quantity of primary treated effluent received from Adani Multispecialty Hospital shall not exceed 25 KLD.

3.6. Industry shall receive primary treated effluent from Adani Multispecialty Hospital as per the Bio-Medical Waste management rules.

3.7. Industry shall provide fixed pipeline with the flow meter for reception of sewage from Mundra town and Adani Multispecialty Hospital.

3.8. Industry shall maintain daily logbook for operation of STP including complete records of effluent conveyed by Mundra town and Adani Multispecialty Hospital.

3.9 Industry shall operate STP adequately to comply following norms

PARAMETERS	PERMISSIBLE LIMIT
pH	6.5 to 9.0
BOD (5 days at 27 C)	30 mg/L
Suspended Solids	100 mg/L
Fecal Coliform	<1000 MPN/100 ml

3.10. Treated sewage confirming to above norms, partially (150 KLD) conveyed to Adani Hospital for greenbelt development & in the hospital premises & remaining (2350 KLD) shall be discharged on land for green belt development within premises.

3.11. Industry shall provide fixed pipeline with flow meter for conveyance of treated effluent to Adani Hospital & maintain its record.

3.12. Industry shall provide fixed pipeline network with flow meter for even distribution of treated effluent for gardening & plantation and maintain its record.

3.13. Disposal system for storm water shall be provided separately. In no circumstances storm water shall be mixed with the industrial effluent.

4. Conditions under the Air Act-1981:

4.1. The following shall be used as a fuel in D.G. Sets;

Sr. No.	Name of Fuel	Quantity
1	Diesel	38 Lit/Hr

4.2. The applicant shall install & operate air pollution control system efficiently in order to achieve prescribed norms.

4.3. The flue gas emission through stack attached to D.G. Sets shall conform to the following standards.

Sr. no.	Stack attached to	Stack height	APCM	Parameter	Permissible limit
1.	D.G. Set (125 KVA)	11 m	Adequate Stack Height	PM	150 mg/NM^3
				SO_2	100 ppm
				NO_x	50 ppm

2.	D.G. Set (25 KVA)	11 m	Adequate Stack Height	PM SO_2 NO_x	150 mg/NM^3 100 ppm 50 ppm

4.4. There shall be no process gas emission from manufacturing process and other ancillary operations.

4.5. The concentration of the following parameters in the ambient air within the premises of the industry shall not exceed the limits specified hereunder as per National Ambient Air Quality Standards issued by MoEF & CC dated 18th November-2009.In addition to following parameters Industry shall also carry out AAQ monitoring of all other applicable parameter as per MoEF notification dated 18/11/2009 and submit the report to the Board.

Sr. No.	Pollutant	Time Weighted Average	Concentration in Ambient air in µg/M^3
1.	Sulphur Dioxide (SO_2)	Annual	50
		24 Hours	80
2.	Nitrogen Dioxide (NO_2)	Annual	40
		24 Hours	80
3	Particulate Matter (Size less than 10 µm) or PM_{10}	Annual	60
		24 Hours	100
4.	Particulate Matter (Size less than 2.5 µm) or $PM_{2.5}$	Annual	40
		24 Hours	60

4.6. The applicant shall provide portholes, ladder, platform etc at chimney(s) for monitoring the air emissions and the same shall be open for inspection to/and for use of Board's staff. The chimney(s) vents attached to various sources of emission shall be designed by numbers such as S-1, S-2, etc. and these shall be painted/displayed to facilitate identification.

4.7. The industry shall take adequate measures for control of noise levels from its own sources within the premises so as to maintain ambient air quality standards in respect of noise to less than 75dB(A) during day time and70 dB (A) during night time. Daytime is reckoned in between 6a.m. and10 p.m. and nighttime is reckoned between 10 p.m. and 6 a.m.

4.8. <u>D.G. Sets Conditions</u>

The D.G. Set shall have acoustic enclosure and shall comply with the standards specified at Sr. no. 95 of Schedule-I of the rule-3 of E.P. Rules -1986 and Noise pollution level as per the Air Act-1981.

D.G. Sets standards:-

The flue gas emission through stack attached to D.G. Sets shall conform to the following standards.

a) The minimum height of stack to be provided with each of the generator set shall be H=h + 0.2 (KVA) 1/2, where H= Total stack height in meter, h= height of the building in meters where or by the side of which the generator set is installed.

b) Noise from DG set shall be controlled by providing an acoustic enclosure or by treating the room acoustically, at the users end.

c) The acoustic enclosure or acoustic treatment of the room shall be designed for minimum 25 dB (A) insertion loss or for meeting the ambient noise standards, whichever is on the higher side (if the actual ambient noise is on the higher side, it may not be possible to check the performance of the acoustic enclosure/ acoustic treatment. Such circumstances the performance may be checked for noise reduction up to actual ambient noise level, preferably, in the night time). The measurement for insertion loss may be done at different points at 0.5 m from the acoustic enclosure/room, and the averaged.

d) The D.G. Set shall be provided with proper exhaust muffler with insertion loss of minimum 25 dB (A).

e) All efforts shall be made to bring down the noise level due to the D.G. Set, outside the premises, within the ambient noise requirements by proper siting and control measures.

f) Installation of a D.G. Sets must be strictly in compliance with the recommendations of the D.G. Set manufacturer.

g) A proper routine and preventive maintenance procedure for the D.G. Set should be set and followed in consultation with the DG Set manufacture which would help prevent noise levels of the DG Set from deteriorating with use.

5. AUTHORIZATION as per HAZARDOUS AND OTHER WASTE (MANAGEMENT AND TRANSBOUNDARY) RULES, 2016 Form-2 [See rule 6 (2)]

5.1 Authorization order no:-**AWH-121264** Date of issue: 06/09/2022.

5.2 **M/s. Adani Mundra SEZ Infrastructure Pvt. Ltd.**, is hereby granted an authorization based on the enclosed signed inspection report for generation, collection, treatment, storage, transport of hazardous waste on the premises situated at Survey no. 141, Vill: Mundra, Tal: Mundra, Dist: Kutch.

Sr. No.	Waste	Quantity per Annum	Schedule & Category	Facility
1	Used Oil	0.01 MT	I-5.1	Collection, storage, transportation and disposal by selling to registered recyclers.

5.3 The authorization shall be valid up to **02/09/2027.**

5.4 The authorization is subject to the conditions stated below and such other conditions as may be specified in the rules from time to time under the Environment (Protection) Act-1986.

5.5 The authorization is granted to operate a facility for collection, storage within factory premises transportation and ultimate disposal of Hazardous wastes as per condition no 5.2 to the industry having valid CCA of this Board.

5.6 **TERMS AND CONDITIONS OF AUTHORISATION**

1. The applicant shall comply with the provisions of the Environment (Protection) Act-1986 and the rules made there under.
2. The authorization or its renewal shall be produced for inspection at the request of an officer authorized by the Gujarat Pollution Control Board.

3. The persons authorized shall not rent, lend, sell, and transfer or otherwise transport the hazardous wastes without obtaining prior permission of the Gujarat Pollution Control Board.
4. Any unauthorized change in personnel, equipment or working conditions as mentioned in the authorization order by the persons authorized shall constitute a beach of this authorization.
5. The person authorized shall implement Emergency Response Procedure (ERP) for which this authorization is being granted considering all site specific possible scenarios such as spillages, leakages, fire etc. and their possible impacts and also carry out mock drill in this regard at regular interval of time;
6. The person authorized shall comply with the provisions outlined in the Central Pollution Control Board guidelines on "Implementing Liabilities for Environmental Damages due to Handling and Disposal of Hazardous Wastes and Penalty"
7. It is the duty of the authorized person to take prior permission of the Gujarat Pollution Control Board to close down the facility.
8. An application for the renewal of an authorization shall be made as laid down in rules 6(2) under Hazardous and Other Waste Rules, 2016.
9. The imported hazardous and other wastes shall be fully insured for transit as well as for any accidental occurrence and its clean-up operation.
10. The record of consumption and fate of the imported hazardous and other wastes shall be maintained.
11. The hazardous and other wastes which gets generated during recycling or reuse or recovery or pre-processing or utilization of imported hazardous or other wastes shall be treated and disposed of as per specific conditions of authorization.
12. The importer or exporter shall bear the cost of import or export and mitigation of damages if any.
13. Any other conditions for compliance as per the Guidelines issued by the Ministry of Environment, Forest and Climate Change or Central Pollution Control Board from time to time.
14. The waste generator shall be totally responsible for (i.e. collection, storage, transportation and ultimate disposal) the wastes generated.
15. Records of waste generation, its management and annual return shall be submitted to Gujarat Pollution Control Board in Form-4 by 30th day of June of every year for the preceding period April to March.
16. In case of any accident, details of the same shall be submitted on Form-11 to Gujarat Pollution Control Board
17. As per "Public Liability Insurance Act-91" company shall get Insurance Policy, if applicable.
18. Empty drums and containers of toxic and hazard material shall be treated as per guideline published for "Management & Handling of discarded containers". Records of the same shall be maintained and forwarded to Gujarat Pollution Control Board regularly.

19. In case of transport of hazardous wastes to a facility for (i.e. treatment, storage and disposal) existing in a State other than the State where hazardous wastes are generated, the occupier shall obtain 'No Objection Certificate' from the State Pollution Control Board or Committee of the concerned State of Union Territory Administration where the facility exists.
20. Unit shall take all concrete measures to show tangible results in waste generation, reduction, avoidance, reuse and recycle. Actions taken in this regard shall be submitted within three months and also along with Form-4.
21. Industry shall have to display the relevant information with regards to hazardous waste as indicated in the Hon. Supreme Court's Order in W.P. No.657 of 1995 dated 14th October, 2003.
22. Industry shall have to display on-line data outside the main factory gate with regard to quantity and nature of hazardous chemicals being handled in the plant, including wastewater and air emissions and solid hazardous wastes generated within the factory premises.

6. **SPECIFIC CONDITIONS:-**

6.1 The authorized actual user of hazardous and other wastes shall maintain records of hazardous and other wastes purchased in a passbook issued by the State Pollution Control Board along with the authorization.

6.2 Handling over of the hazardous and other wastes to the authorized actual user shall be only after making the entry in the passbook of the actual user.

6.3 In case of renewal of authorization, a self-certified compliance report in respect of effluent, emission standards and the conditions specified in the authorization for hazardous and other wastes shall be submitted to SPCB.

6.4 The occupier of the facility shall comply Standard operating procedure/guidelines published by MOEF&CC or CPCB or GPCB from time to time.

6.5 Unit shall comply provisions of E-Waste Management Rules-2016.

6.6 The disposal of Hazardous Waste shall be carried out as per the waste Management hierarchy.

6.7 The occupiers of facilities shall not store the hazardous and other wastes for a period not exceeding **ninety days**. Prior permission of the Board shall be obtained for extension of the storage period.

6.8 The occupier shall maintain the records of generation, sale, storage, transport, recycling, co processing and disposal of hazardous waste and make available during the inspection.

6.9 The transportation of the hazardous waste shall be carried out in GPS mounted dedicated vehicles.

7. **GENERAL CONDITIONS: -**

7.1 Any change in personnel, equipment or working conditions as mentioned in the consents form/order should immediately be intimated to this Board.

7.2 Applicant shall also comply with the general conditions given in annexure I.

7.3 Whenever due to accident or other unforeseen act or ever, such emissions occur or is apprehended to occur in excess of standards laid down such information shall be forthwith reported to Board, concerned Police Station Office of Directorate of Health Service, Department of Explosives, Inspectorate of Factories and local body.

7.4 In case of failure of pollution control equipments, the production process connected to it shall be stopped. Remedial actions/measures shall be implemented immediately to bring entire situation normal.

7.5 The Environmental Management Unit/Cell shall be setup to ensure implementation on and monitoring of environmental safeguards and other conditions stipulated by statutory authorities. The Environmental Management Cell/Unit shall directly report to the Chief Executive of the organization and shall work as a focal point for internalizing environmental issues. These cells/units also coordinate the exercise of environmental audit and preparation of environmental statements.

7.6 The Environmental audit shall be carried out yearly and the environmental statements pertaining to the previous year shall be submitting to this State Board latest by 30th September every year.

7.7 The Board reserves the right to review and/or revoke the consent and/or make variations in the conditions, which the Board deems, fit in accordance with Section 27 of the Act.

7.8 In case of change of ownership/management the name and address of the new owners/ partners/directors/proprietor should immediately be intimated to the Board.

7.9 Industry shall have to display the relevant information with regard to hazardous waste as indicated in the Hon. Supreme order in w.p. no. 657 of 1995 dated 14th October 2003.

For and on behalf of
GUJARAT POLLUTION CONTROL BOARD

(Smt. U.K. Upadhyay)
Senior Environment Engineer

NO: GPCB/CCA-Kutch-805(3)/ID-10602/ **Date:-**

Issued to:
M/s. Adani Mundra SEZ Infrastructure Pvt. Ltd.,
Survey no. 141 (Part),
Vill: Mundra,
Tal: Mundra,
Dist: Kutch – 370 421

Annexure – 7

Details of Greenbelt Development at APSEZ, Mundra

Total Green Zone Detail Till Up to September – 2022					
LOCATION	**Area (In Ha.)**	**Trees (Nos.)**	**Palm (Nos.)**	**Shrubs (SQM)**	**Lawn (SQM)**
SV COLONY	71.66	34920.00	7962.00	69696.00	100646.00
PORT & NON SEZ	81.61	149359.00	19220.00	75061.78	62966.38
SEZ	116.60	227120.00	20489.00	220583.60	28162.03
MITAP	2.52	8168.00	33.00	3340.00	4036.00
WEST PORT	109.37	258252.00	70831.00	24612.00	22854.15
AGRI PARK	8.94	17244.00	1332.00	5400.00	2121.44
SOUTH PORT	14.45	27530.00	3470.00	3882.00	3327.26
SAMUDRA TOWNSHIP	57.27	63722.00	11834.00	23908.89	47520.07
PRODUCTIVE FARMING (VADALA FARM)	23.79	27976.00	0.00	0.00	0.00
TOTAL (APSEZL)	**486.19**	**814291.00**	**135171.00**	**426484.27**	**271633.33**
		Total Saplings: 949462.00 Nos.			

Annexure – 8

DETAILED ENERGY AUDIT REPORT

AT

Adani Ports & Special Economic Zone Ltd (Samudra Township)
Mundra,
Gujarat-392130, India

Prepared by

Eco Energy Solution

49, Sector 2, Sarika Society, Samrat Nagar, Isanpur,
Ahmedabad – 382443, Gujarat, INDIA

Feb 2022

ACKNOWLEDEMENT

We are grateful to the management of Adani Ports & Special Economic Zone Ltd for giving us an opportunity to contribute in their efforts towards efficient energy management by undertaking this Energy Audit study exercise.
Eco Energy Solution acknowledges with thanks the co-operation and support extended by management and operating personnel at Adani Ports & Special Economic Zone Ltd during the audit exercise. Detailed discussions and interaction were held with plant personnel throughout the course of the audit and awareness of energy conservation was noted as exemplary. We would also like to place on record our sincere thanks and appreciation for all plant executives. Our special thanks are to,

- Mr. D. Varu - Associate Manager
- Mr. G.Pavar - Assistant Manager
- Mr. J.Nandaya - Senior Engineer
- Mr. D.Joshi - Senior Engineer
- Mr. S.Trivedi - Senior Engineer

We are also thankful to the other staff members who were actively involved while collecting the data and conducting the field studies. We take this opportunity to also thank all the team members at various departments associated with this study of energy audit for extending cooperation during collection of on-site data.

We trust that the findings of this study will help plant management in improving the equipment performance thereby giving optimum energy consumption at Adani Ports & Special Economic Zone Ltd.

We have prepared this Energy Audit report document Adani Ports & Special Economic Zone Ltd, on a best judgment basis.

While all reasonable care has been taken in its preparation, details contained in this report have been compiled in good faith based on information provided and measurements undertaken at the facility.

For ECO ENERGY SOLUTION

Krunal Shah Lead Auditor (Partner)

Pushkar Khanna AEA 0260 (Partner)

Company Profile

Adani Ports and Special Economic Zone Limited (APSEZ) is the largest commercial ports operator in India accounting for nearly one-fourth of the cargo movement in the country. Its presence across 13 domestic ports in seven maritime states of Gujarat, Maharashtra, Goa, Kerala, Andhra Pradesh, Tamil Nadu and Odisha presents the most widespread national footprint with deepened hinterland connectivity. The port facilities are equipped with the latest cargo-handling infrastructure which is not only best-in-class, but also capable of handling the largest vessels calling at Indian shores. Our ports are equipped to handle diverse cargos, from dry cargo, liquid cargo, crude to containers.

Through its subsidiary Adani Logistics Ltd., APSEZ operates three logistics parks located at Patli in Haryana, Kila-Raipur in Punjab and Kishangarh in Rajasthan. With the ability to handle 500,000 twenty foot equivalent units (TEUs) annually, the Adani logistics business is growing at a rapid pace.

Over the years, APSEZ has evolved into a provider of integrated port infrastructure services, of which the Mundra SEZ in Gujarat is a landmark validation. Spanning over 8,000 hectares, the Mundra Economic Hub offers investment options as the largest multi-product SEZ, Free Trade and Warehousing Zone (FTWZ) and Domestic Industrial Zone.

The Company's integrated services across three verticals, i.e. Ports, Logistics and SEZ, has enabled it to forge alliances with leading Indian businesses making APSEZ an undisputed leader in the Indian port sector.

Along with its expertise in providing end-to-end logistics solutions, operational excellence, low-cost operations and synergies through acquisitions, APSEZ was also certified as a Great Place to Work in FY 2021-22. The Company is backed by a young and dynamic workforce that propels it to greater heights.

In order to reduce increasing energy costs, Adani Ports and Special Economic Zone Limited (APSEZ) approached ECO ENERGY SOLUTION for conduct of energy audit for their Mundra Plant at APSEZ, Mundra, Gujarat. This proposal was approved by plant vide its purchase order no 5702004681 dated 06.02.2022.

This energy audit report for APSEZ Mundra Port presents the analysis of the data collected, observations made and field trials undertaken from 18th to 20th Jan 2022. It is governed by the objectives, scope of work, and methodology discussed in ensuing report sections.

Key Result Areas for Energy Savings & Estimated Potential along with Broad Cost Benefit Analysis

Sr. No	Key Savings Areas	Remarks	Savings in power or Fuel	Annual Savings potential	Approx Investment cost	Simple payback period
			kWh or MT	Rs Lakh	Rs Lakh	Months
Short Term Areas						
1	Install M.D Controller to save penalty charges	Save Penalty Charges	1564779.6	19.56	2	1.22
2	Replace Main Irrigation Tank Submersible Pump by new Energy Efficient Pump	New Energy Efficient Pump to improve performance	12514.14	0.65	0.6	11.06
3	Savings Potential to optimized Pressure of STP Air Compressor	Reduction of pressure 2 kg/cm2	3888	0.21	Nil	Immediate
4	Savings potential to improve Efficiency of STP Samundra township Blowers	Improve performance of STP Blower	21546	1.12	0.3	3.2
Long Term Area						
5	Replace old 2 star to 5 star rated Energy Efficient AC's	New energy efficient 5 star rated AC	593750	30.88	105	40.8
6	Replace Conventional to Energy Efficient BLDC Fan	BLDC Fan Replacement	207360	10.78	48	53
	Total Electricity Savings	kWh	2403837.74	63.20	155.9	29.60

Intangible Savings:

AC'S:

- **Replacement with Inverter ACs**
  - Digital Inverter technology maintains precise control of room temperature and creates a comfortable environment. In conventional split Air Conditioners, the compressor switches off once the set temperature is reached, and switches on again after temperature drops. The time it takes for the Split Air Conditioner to switch on and off causes the room temperature to greatly fluctuate. With Digital Inverter, the inverter control reduces the compressor power once the desired temperature has been reached, but continues operating at a reduced state to maintain a stable room temperature with minimal fluctuations. By putting an end to on/off compressor operation, the inverter technology also allows Digital Inverter to significantly reduce noise levels; Superior reliability has been achieved, due to the reduction of the compressor ON/OFF cycles. Digital DC Inverter Air Conditioners provide this benefit to consumers, helping them to achieve various benefits such as saving of at least 25% of their energy costs. These air conditioners are much quieter and offer higher levels of efficiency as their noisier counterparts. The average AC power consumption as recorded during winter (present time) is about 55 KW. This is likely to be 30 to 35% higher during hot season. The average consumption could be put at 60 KW/month over year. The power savings with digital inverter type AC units would at 20% would be 12 KW/month. The annual energy conservation potential of this intervention is: 94,000 kWh/year.

- **Overhaul of Refrigerant Piping Insulation & Filter Maintenance**

  - The Gas pipe insulation was found to be damaged at various points on the AC units. Mending / replacement of insulation would improve the performance of AC units. Cleaning of filters of all indoor units and cleaning of condenser fins by jet pumps. Average life of typical Split Units is considered to be 10 years in dry climates without corrosive pollutants.
  - Using all Units at Specific Set Points can greatly reduce HVAC energy consumption. It was observed that the set-point for ACs was generally at 19 Deg C in the offices. All AC units may be set at 23/24 ^{0}C for optimum power consumption. The annual energy conservation potential of this intervention is: 28,500 kWh/year

- **Building-Envelope & Air-Conditioned Space Insulation**

  - Weather-Stripping of All Doors, especially the main entrance doors into all building cavities. Use of Air curtain on Ground Floor Entrance to curtail infiltration losses: Frequenting clients on Ground Floor through main entrance incurs losses due to infiltration. These could be curtailed using Air Curtains. The advantage would be more prominent during summa

- **Enhanced Use of Natural Lighting**

- Natural lighting available at the premises through the existing glass facades needs to be exploited to reduce the lighting load exerted. Currently, most of the glass facades are shielded using vertical-blinds and artificial lighting is used even in areas in the vicinity of glass panes. This intervention has the twin beneficial impact of reducing manufacturing related LCA impacts of lighting fixtures as well as reduced energy consumption. Some green architecture guidelines specify design lighting loads in the vicinity of 7.5 W/sq.m. For building occupancy of 10 hours/day, the average annual electricity conservation and GHG emissions mitigation per sq. m of naturally lit space relative to conventionally lit space is estimated to be 27 kWh/sq.m and 24 kgCO2e/sq. m.

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Chapter – 1
Introduction

General Information

Name of the Industry	**:** Adani Ports and Special Economic Zone Ltd (APSEZ) Samudra Township
Address	**:** PO Box No.1, Mundra, Kutch 370 421, Gujarat
Contact Person	**:** Mr. Jagmal Nandaniya Dy. Manager- Engineering Services
Industry Sector	**:** Township
Business Activity	**:** Township
Year of Establishment	:
Type of Work	: Detailed Energy Audit
Annual Electricity consumption	: 46,23,450 kWh (Feb-21 to Jan-22)
Address of the Auditors	: M/s Eco Energy Solution ECO HOUSE 49/2, Sarika Society, Samrat Nagar, Isanpur, Ahmedabad 382443 Gujarat, India
Energy Audit Team Members	: 1) Mr. Pushkar Khanna (AEA-0260) 2) Mr. Krunal Shah (Lead Auditor) 3) Mr. Nainesh Patel (Sr. Engineer) 4 Mr. Hadik Rabari (Engineer) 5) Mr. Anand Shah (Field Engineer) 6) Mr. Saif (Engineer) 7) Mr. Shiv Patel (Field Engineer)

1 Introduction

1.1 Preamble

- Adani Ports and Special Economic Zone Limited (APSEZ) is the largest commercial ports operator in India accounting for nearly one-fourth of the cargo movement in the country. Its presence across 13 domestic ports in seven maritime states of Gujarat, Maharashtra, Goa, Kerala, Andhra Pradesh, Tamil Nadu and Odisha presents the most widespread national footprint with deepened hinterland connectivity. The port facilities are equipped with the latest cargo-handling infrastructure which is not only best-in-class, but also capable of handling the largest vessels calling at Indian shores. Our ports are equipped to handle diverse cargos, from dry cargo, liquid cargo, crude to containers.

- Through its subsidiary Adani Logistics Ltd., APSEZ operates three logistics parks located at Patli in Haryana, Kila-Raipur in Punjab and Kishangarh in Rajasthan. With the ability to handle 500,000 twenty foot equivalent units (TEUs) annually, the Adani logistics business is growing at a rapid pace.
- Over the years, APSEZ has evolved into a provider of integrated port infrastructure services, of which the Mundra SEZ in Gujarat is a landmark validation. Spanning over 8,000 hectares, the Mundra Economic Hub offers investment options as the largest multi-product SEZ, Free Trade and Warehousing Zone (FTWZ) and Domestic Industrial Zone.
- The Company's integrated services across three verticals, i.e. Ports, Logistics and SEZ, has enabled it to forge alliances with leading Indian businesses making APSEZ an undisputed leader in the Indian port sector.
- Average annual Electricity bill is in the range of Rs. 2.45 Cr. (Feb-21 to Jan-22) for APSEZ Samundra Township.
- In order to reduce increasing energy costs, APSEZ approached Eco Energy Solution for conduct of energy audit. Eco Energy Solution has submitted proposal. This proposal was accepted by APSEZ vide its Purchase order no. 5702004681 dated 06.01.2022. This energy audit report for Adani Ports and Special Economic Zone Limited (APSEZ) presents the analysis of the data collected, observations made and field trials undertaken by EES. It is governed by the objectives, scope of work, and methodology discussed in ensuing paragraphs.

1.2 Objectives

- To undertake an energy audit so as to identify areas for energy saving, both without and with investment.

- To prioritize distinct areas identified for energy savings depending upon saving potential, skills, and time frame for execution, investment cost, paybacks etc.

1.3 Scope of Work

- To correlate monthly data of production with electricity, fuels & water consumption, for a period of 12 months of normal operation to establish bench mark values for energy consumption.

- To study electrical energy metering, monitoring and control system existing at the plant and to recommend a suitable system for future monitoring.
- To study monthly power factor, maximum demand, working hours, load factor etc. for the reference period along with monthly electricity consumption and establish scope for MD control through possible optimization of load factor and through detailed load management study.
- To undertake a detailed motor load study on major continuously operating motors equal to and above 10 HP with the help of a clamp on multi-meter to identify instantaneous motor parameters like kW, KVA, P.F., A, V, frequency etc.
- Based on above, to evaluate the possibility of replacing major motors with energy efficient motors. To provide cost benefit analysis for the replacement policy.
- To study compressed air distribution system in the plant, in terms of compressor type, make, capacity, loading, motor type / size / loading etc. and to undertake output efficiency test for the operating compressors.
- To study existing requirements of energy provisions at present locations and to identify distinct possibilities of rationalization / savings.
- To study operation of utilities with the help of operating records kept and spot measurements taken during the field study and identify specific energy consumption of equipment in usage and identify scope for optimization through improved operating / maintenance practices.
- To study existing maintenance practices for utility systems and recommend areas for improvement in energy efficiency / savings.
- To identify, evaluate and prioritise energy saving opportunities into short, mid and long-term time spans depending upon investments, quantum of savings, skills and time required for implementation, etc.
- To recommend a time-bound action plan for implementation of accepted measures.
- To prepare draft energy audit report, present to management, undertake necessary modifications based on presentation meeting and submit the final report.

1.4 Methodology

- Eco Energy Solution deputed following team of experts for conducting the study and worked in close association with unit personnel.

  - Mr. Pushkar Khanna, Accredited Energy Auditor from BEE
  - Mr. Krunal Shah, Lead Auditor- Energy Management System
  - Mr. Nainesh Patel, Sr. Engineer
  - Mr. Anand Shah, Field Engineer
  - Mr. Hardik Rabari, Engineer
  - Mr. Saif, Engineer
  - Mr. Shiv Patel, Field Engineer

- Eco Energy Solution submitted an execution work plan for the assignment for which APSEZ personnel provided relevant data support.
- APSEZ Unit personnel nominated specific persons from engg. / Maintenance sections along with a coordinator of senior managerial level for this audit.
- Eco Energy Solution undertook an "Orientation Meeting" with management / engg. / Maintenance personnel prior to start of the audit.
- EES's team conducted all necessary field trials and measurements.
- EES provided all the instruments necessary for conducting the field trials.
- Following instruments were used by EES team.

Table 1 : Instrument Used by Audit Team

Sr. No.	Instrument Name	Specification
1.	Demand Analyzer	Suitable for 1φ, 3φ. 156 electrical parameters like voltage, current, frequency, harmonics, active & reactive power, power factor etc.
2.	Clamp-on Power Meter	0 - 1200 kW 0 - 600 Voltage, AC 0 - 800 Voltage, DC 0 - 2000 A, Current, AC / DC
3.	Power Quality Analyzer	3 Ph 4 Wire Recording Parameters: Voltage, Current, Frequency, Harmonics/ Inter harmonics up to 50th, THD of V, I and KW with K Factor, Transients, Voltage Sag- Swells, All Power Parameters, Inrush current, Load Unbalance, Flicker Recording etc. enabling graphical, vectorial, numerical representation, trending of data, monitoring of events etc.
4.	Lux Meter	0 - 50,000 lux level Non Contact Type
5.	Digital Thermo Anemometer	0 - 45 m / sec. ± 3%
6.	Relative Humidity and Temperature Indicator	RH – 10% to 95% Temp. – 0 – 100 °C Handheld unit
7.	Infrared Thermometers	40 ^{0}C to 500 ^{0}C
8.	Portable Temperature Indicator	50 ^{0}C to 1200 ^{0}C
9.	Ultrasonic Water Flow Meter	0 – 15 m/sec 25 – 5000 mm homogeneous liquids without gas bubbles +/- 0.5 %
10.	Stop Watch	--
11.	Flue gas Analyser	Flue gas analysis, %CO_2, O_2, CO, NOx, SOx, temp.
12.	Digital Pitot Tube	Air flow differential pressure for flow

Chapter 2
Energy Scene of the Plant

2 Energy Flow

2.1 Energy Scene

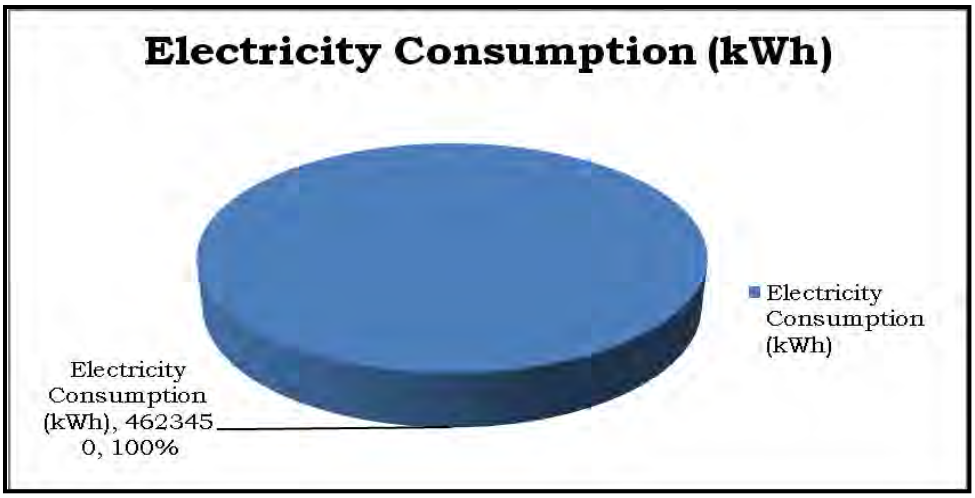
- Primary energy sources for the plant are Electricity. The primary energy sources are consumed for running of utilities and production equipment. Electricity is used for residential utility, STP and lighting system etc.

Table 2 : Overall Annual consumption of primary sources

Energy Consumption by Fuel Medium	Units
Electricity Consumption (kWh)	4623450

All Source of energy Consumption Conversion in kWh.

Figure 1 : Annual Energy consumption as per Energy Media



2.2 Energy: Sources & Utilisation

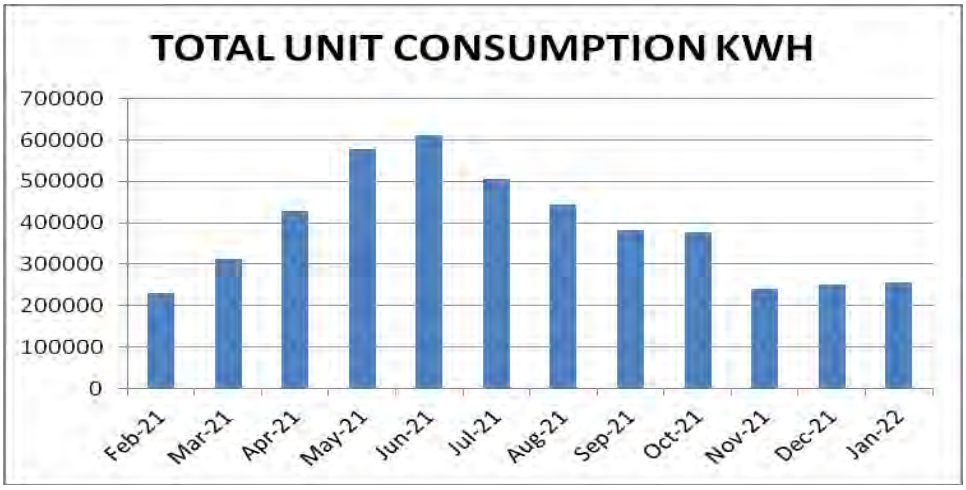
- Energy sources for the plant are Imported Electricity. These sources are consumed for the various running of utilities like Pump, Blower, Air compressor etc. Electricity is also used township, home utility, admin & substation applications, air conditioners and lighting system.
- Electricity and water have been used in the township.

- Average monthly grid unit consumption and billed demand registered are 385287.5 kWh and 844.63 kVA, respectively.
- After fixed department deducted Average unit cost of power is Rs 5.28/kWh. For review of payback period of energy saving measures report has considered electricity energy costs at Rs 5 /kWh.
- Overall bill Average unit cost of power is Rs. 5.28/kWh.
- Average Power factor is 0.999 and is maintained satisfactorily.

Table 3 : Monthly Electricity Consumption

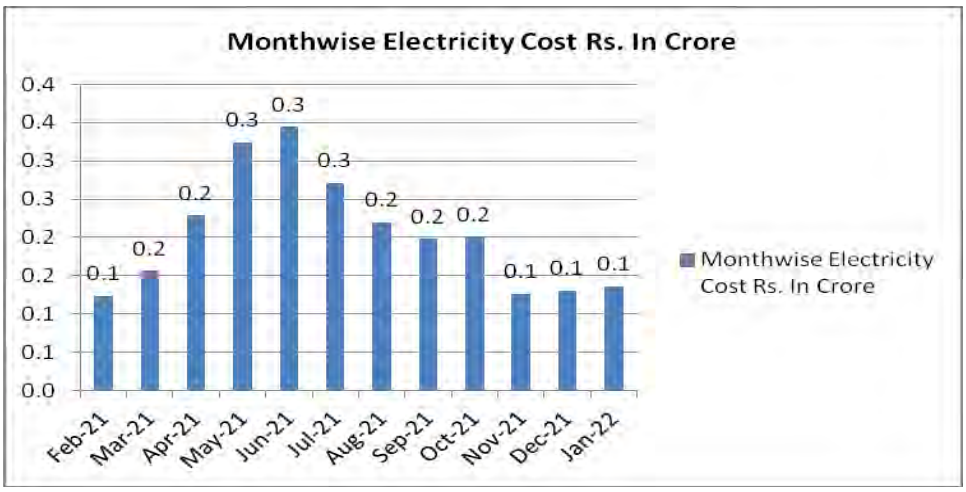
Sr. No	Months	Contract demand (kVA)	Actual demand (kVA)	Billing demand (kVA)	Total unit consumption (kWh)	Fixed charge (Rs.)	TOU unit consumption on (kWh)	Total bill of the month (Rs.)	P.F	P.F rebate (Rs.)	Overall rate (Rs/kWh)	Excess demand kVA	Excess kWh	Excess charges paid Rs.
1	Feb-21	900	972.5	765	231450	3785560	77100	1237234	1	-4860	5.35	0	0	0
2	Mar-21	900	970.5	765	312000	426870	104100	1561325	1	-6552	5.00	0	0	0
3	Apr-21	900	1056	900	427800	486000	142500	2286617	1	-8984	5.35	156	112320	140400
4	May-21	900	1410	900	579000	502200	193050	3242952	1	-12159	5.60	510	379440	474300
5	Jun-21	900	1534.5	900	610800	486000	203550	3443930	0.99	-11178	5.64	634.5	452271.6	565339.5
6	Jul-21	900	1300.5	900	506700	502200	168900	2706781	1	-10641	5.34	400.4	297972	372465
7	Aug-21	900	1020	900	445050	502200	148350	2199836	1	-9346	4.94	120	89280	111600
8	Sep-21	900	1029	900	383100	486000	127800	1978424	1	-8045	5.16	129	92880	116100
9	Oct-21	900	1089	900	378150	502200	126000	2005571	1	-7941	5.30	189	140616	175770
10	Nov-21	900	570	765	241800	413100	80550	1258944	1	-5078	5.21			0
11	Dec-21	900	702	765	250200	426870	83400	1302011	1	-5254	5.20	0	0	0
12	Jan-22	900	775.5	775.5	257400	432729	85800	1361692	1	-5405	5.29	0	0	0
TOTAL			**12429**	**10135.5**	**4623450**	**8951929**	**1541100**	**24585318**		**-95443**	**63.39**	**2138.9**	**1564779**	**1955974**
AVERAGE			**1035.7**	**844.63**	**385287.5**	**745994**	**128425.00**	**2048776.5**	**0.99**	**-7953.6**	**5.28**	**194.4**	**142252.6**	**162997.8**

Figure 2 : Month wise Energy Consumption at APSEZ (kWh)



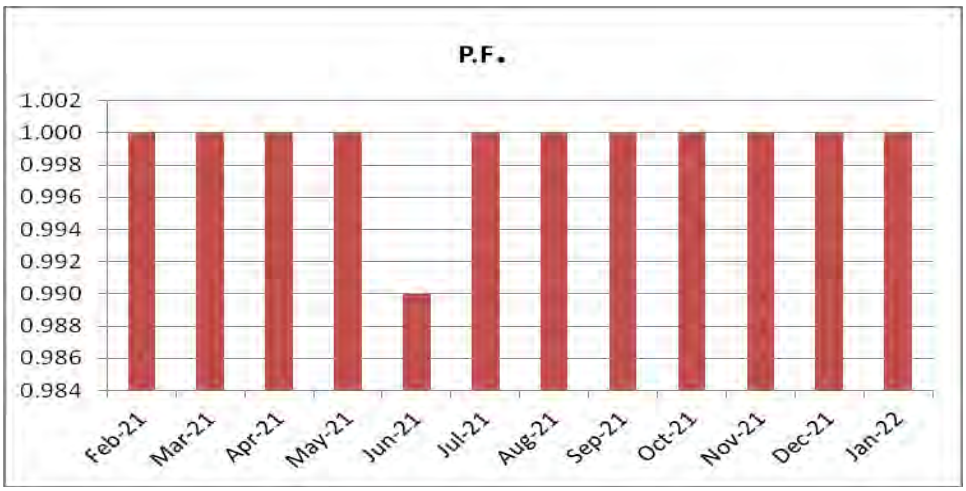
Total unit consumption higher found in month of Jun-21

Figure 3 : Month wise electricity cost at APSEZ



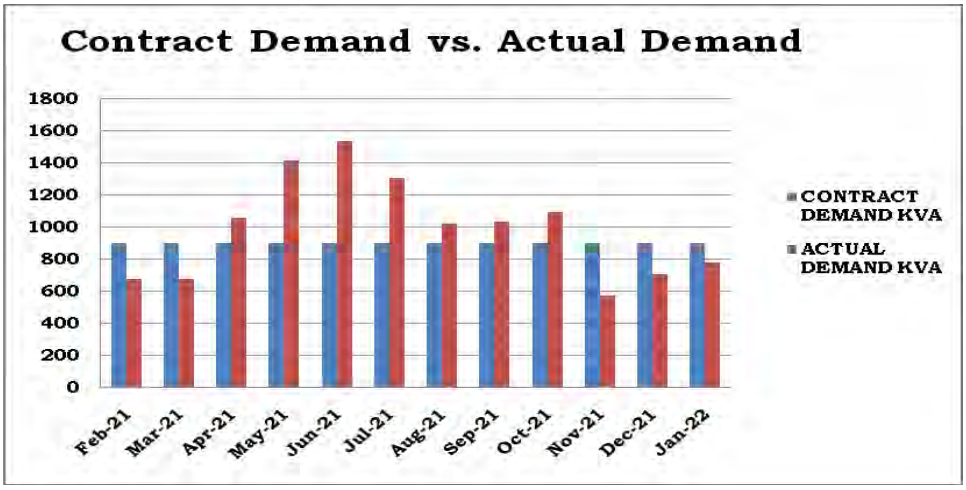
Total Bill Electricity cost higher found in month of Jun-21

Figure 4 : Month wise power factor at APSEZ



Lowest P.F Found in Month of Jun-21

Figure 5 : Month wise Maximum Demand (kVA) at APSEZ



During Bill analysis observe that Month of Apr-21 to Oct-21 is Actual Demand cross the Contract Demand, Actual Pick demand in the month of Apr-21 is 156 kVA, May-21 is 510 kVA. Jun-21 is 634.5 kVA, July-21 is 400.5 kVA Aug-21 is 120 kVA, Sep-21 is 129 kVA and Oct-21 is 189 kVA. Actual demand is more than contract demand in the months of May, June, July, August, September and October. This may be because of additional cooling requirement in summer season.

2.3 Install M.D Controller to Save Penalty Charges

Background

- It noted that during last one year M.D. has crossed contract demand of 900 kVA seven times in a year.
  Due to this Rs. 19.55 Lakh has been paid as penalty charges during last one year.

Table 4 : M.D Controller to Save Penalty Charges

SR NO.	MONTHS	Excess Demand kVA	Excess kWh	Excess charges paid Rs.
1	21-Apr	156	112320	140400
2	21-May	510	379440	474300
3	21-Jun	634.5	452271.6	565339.5
4	21-Jul	400.45	297972	372465
5	21-Aug	120	89280	111600
6	21-Sep	129	92880	116100
7	21-Oct	189	140616	175770
TOTAL		**2138.95**	**1564779.6**	**1955974.5**

Proposed Measure:

- It is proposed to co-ordinate production planning in a way that energy demands do not shoot all of a sudden. This happens particularly during shift change when all machines are started same time. Co-ordination between production and utility sections for staggered operation / production planning will help to avoid exceeding maximum demand.
- Installation of a maximum demand controller which will help to monitor demand and also give alarm in case of exceeding setpoint values of maximum demand.
- Looking into further expansion and to prevent Penalty in future, it is recommended to install a M.D. Controller.
- However if in future demand is going to increase, Contract demand may be increased to avoid penalty.

Savings Anticipated

- By doing as per above and considering maximum 7 times exceeding of M.D.,
- Savings anticipated will be Rs. 19.55 lakh for penalty (and reduction of 0.5% cable losses)

Investment Required

- Budgetary allocation of Rs. 2 lakh for maximum demand controller and a SCADA based integration of real time demand monitoring is considered.

Pay Back Period

Simple payback period is 1.22 months.

2.4 Energy Metering, Monitoring & Control System - Existing Status

Electricity

- Electrical energy consumption at the plant is measured on the main tri-vector meter provided at plant MCC & PCC on daily basis. Plant wise energy monitoring system is recorded in excel format for easy analysis.
- Adequate instrumentation was observed for voltage, current, power, power factor.
- Demand controller is not installed with alarm system.
- Adequate instrumentation observed for HVAC parameters monitoring and recording.
- Data management and analysis are appreciable of the working staff.

WATER

- Water supply mainly incoming source is Borewell. Analog flow meter installed in system.
- Water measurement is done by plant at various areas like Harvesting Pump, STP Pump, and Borewell Pumps.
- Water is available from Narmada canal through water supply authority of MUPL and it is utilised for two major purposes. 1. Residential purpose, 2. Horticulture.
- Proper metering and totalizers are installed at the pump line.
- Daily record of water consumption is maintained by Samudra Township.

2.5 Energy Metering, Monitoring & Control System - Existing Status

- Housekeeping is observed in line & maintenance is also observed in good condition.
- Using of natural lighting whenever possible during day time for office use was seen at some places.
- Air conditioners with inverters are not installed in Samudra township.
- Streetlight with LED fixtures has been fitted for reduction of lighting power.
- Based on geographical time zone, timers for turning on/off streetlights have been installed in street lighting.

Suggestions: -

- During Audit 11 KV HT Side Meters not working condition to repair, so daily HT to LT Side looses Find out.
- Open a scheme for obtaining suggestions for conserving energy.
- Display regularly the usage of energy, energy cost & consumption of all departments / Township Area.
- ESR System installs level measurements system to save power & water.

Chapter – 3
Performance Assessment of utilities (Observations, Field Trials, Analysis, Energy Savings)

3 Performance Assessment of Utilities

- The study of plant operations, data collection, observations, field trials and analysis of various areas was undertaken, keeping in view the energy scene at the unit, focus areas elaborated in the previous chapter and with a view to identity energy conservation opportunities in the same. The basis for this is the orientation visit, discussions with the plant personnel and the agreed plan for data collection and field trials. All these trials were undertaken at normal operating conditions.

3.1 Electrical Energy

- As explained earlier, the source of outside power for the plant is from MPSEZ grid at 11 KV. The power received is further stepped down to 11 KV through a transformer.
- As described earlier, the source of electric power for the township is from MPSEZ grid at incoming at 11 KV. The power received is further stepped down to 433V through an eight transformers at various locations and is further distributed in Samudra Township.
- During audit period performance is tested by measuring electrical parameters for each Transformer under operation.
- Installation and performance of transformers is as under.
- Performances of transformers are as under.

Table 5 : Transformer Installation Details

List of Township Transformers Location wise.

Location	Rated kVA	Voltage (HV/LV) V	Current Amp (HV/LV)	Make	Cooling	Frequency
CSS Transformer for A18 Samundra Colony		11000/433	157/4000	Voltamp	ONAN	50
CSS TR for S A32 Samundra Colony		11000/433	157/4001	Voltamp	ONAN	50
Samundra Township B15 TR	1000	11000/433		CSS	ONAN	50
Samundra Township B67 TR	1000	11000/433		CSS	ONAN	50
CSS TR for Solar B24		11000/433	157/4004	Voltamp	ONAN	50
TR for C1 Block		11000/433	157/4005	Voltamp	ONAN	50
CSS TR for C35		11000/433	157/4006	Voltamp	ONAN	50
Samundra Township TR for STP	315	11000/433	16.55/420	Universal	ONAN	50

- Power measurement of transformers was conducted which included monitoring of variation in voltage, load, power factor, Current, harmonics and other

incidental parameters. The detailed 1-minute interval data logging is available separately in chart and Load cycle as shown below.

- Efficiency test on nos. of transformer efficiency. Following table describe the details.

Table 6 : Transformer Loading & Efficiency

Rated Specifications	CSS Transformer for A18 Samudra Colony	CSS TR for S A32 Samudra Colony	Samudra Township B15 TR	Samudra Township B67 TR	CSS TR for Solar B24	TR for C1 Block	CSS TR for C35	Samudra Township TR for STP
Rated kVA			1000	1000				315
Voltage (HV/LV) V	11000/433	11000/433	11000/433	11000/433	11000/433	11000/433	11000/433	11000/433
Current Amp (HV/LV)	157/4000	157/4001			157/4004	157/4005	157/4006	16.55/420
Make	Voltamp	Voltamp	CSS	CSS	Voltamp	Voltamp	Voltamp	Universal
Cooling	ONAN	ONAN	ONAN	ONAN	ONAN	ONAN	ONAN	ONAN
Frequency	50	50	50	50	50	50	50	50
Location								
Serial No.								
Manufacturing Year								2007
Transformer Rating in KVA	2500	2500	1000	1000	2500	2500	2500	315
%Z								
Avg.Load in KVA	156.80	54.20	127.50	62.80	241.40	25.50	11.30	67.20
Present % Loading	6.27	2.17	12.75	6.28	9.66	1.02	0.45	21.33
Rated Full Load Losses of Transformer (kW)			13.30	13.30				
Total Losses of Transformer(kW)			1.80	1.80				
Operating Power Factor	1.000	1.000	1.000	0.900	0.900	1.000	1.000	0.800
No Load Loss (KVA)	2.34	2.34	1.80	2.00	2.60	2.34	2.34	2.93
Total Losses= Load Losses+N.L. Losses	3.33	2.68	3.00	2.59	4.13	2.50	2.41	6.30

Rated Specifications	CSS Transformer for A18 Samudra Colony	CSS TR for S A32 Samudra Colony	Samudra Township B15 TR	Samudra Township B67 TR	CSS TR for Solar B24	TR for C1 Block	CSS TR for C35	Samudra Township TR for STP
Transformer Efficiency, %			97.64	95.87				
Avg. Load in KW	155.10	53.20	124.90	59.20	236.70	25.00	11.00	52.70
Max load, kW	251.80	106.60	211.00	101.30	534.00	65.60	22.50	75.00
Min load, kW	59.80	14.00	81.40	32.50	-0.30	12.40	3.10	29.80
Voltage Unbalance %	0.95	2.54	1.45	1.42	0.20	0.40	0.70	0.30
Current Unbalance %					0.70	36.40		9.20
Voltage THD Avg.	2.30	2.30	2.40	2.30	1.60	1.40	1.60	2.20
Current THD Avg.	8.20	18.80	15.40	32.60	16.20	18.40	18.00	10.60

3.1.1 Main Incomer 66/11 kV 18th to 19th January 2022 Logging

- The 24 hr. power measurement at the 11 KVA Main Incomer was conducted. This included monitoring of variation in voltage, load, power factor, Current, harmonics and other incidental parameters. The detailed 1 minute interval data logging is available separately in chart and Load cycle in below.
- The brief summary charts for variation in voltage, Current, Demand & P.F. is presented below.
- Power quality data as recorded at Transformer incomer is presented in table below. Overall PF values are within satisfactory limits.

Table 7 : 66/11 kV Main Incomer Data Recordings, 18th to 19th January

Location - Samundra Township 11 KV Main Incomer			
Date -18/01/2022 to 19/01/2022		Time -03:05:00 PM to 03:03:00 PM	
Parameters	**Minimum**	**Average**	**Maximum**
Voltage (V)			
U12 rms	11180	11333.1	11480
U23 rms	11140	11282	11410
U31 rms	11170	11301	11440
Voltage (V)			
V1 rms	6370	6439.2	6570
V2 rms	6530	7555.3	7660
V3 rms	5660	5767.9	6570
Current			
L1 (A)	9.2	17.3	32.6
L2 (A)	13.5	26.5	57.2
L3 (A)	9.5	18.2	36.5
Active Power			
Total (KW)	206.8	409.3	831
Reactive Power			
Total (KVAR)	-57.4	2.5	87.5
Apparent Power			
Total (KVA)	217.8	418.1	847.7
Voltage Unbalance			
Total Uunb (IEEE 112)	0.2	14.7	15.5
Ampere Unbalance			
Total Aunb (IEEE 112)	17.9	27.8	38.3

Location - Samundra Township 11 KV Main Incomer			
Power Factor			
Total	0.9	1	1
Harmonics			
Voltage THD %	2.1	7.2	7.9
Current THD%	5.1	10.9	15.8

Remarks: Phase wise Load unbalance found. Suggest single phase load balance properly. Average 27.8 % load unbalance found.

Figure 6 : Voltage Profile of Samundra Township 11 KV Main Incomer (Logging on 18th & 19th Jan 2022)

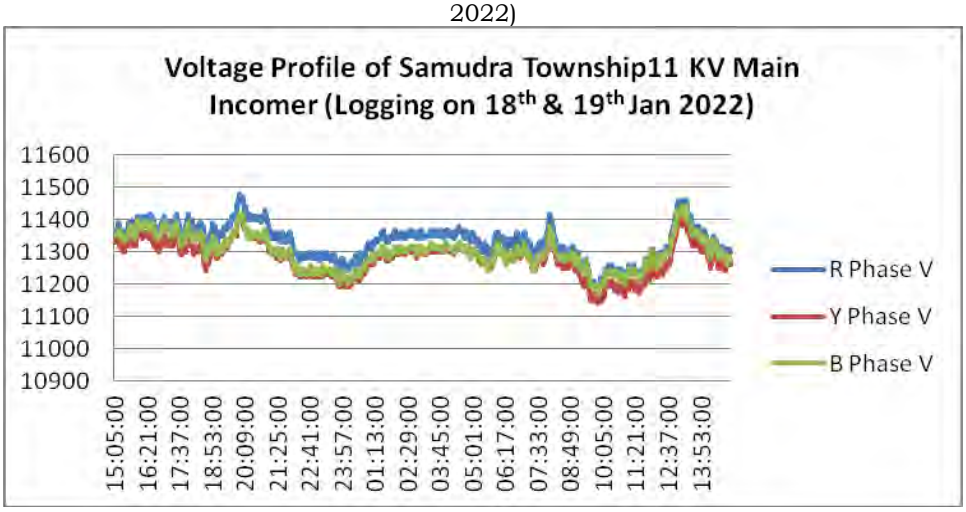


Figure 7 : %Voltage Harmonics Profile of Samundra Township 11 KV Main Incomer (Logging on 18th & 19th Jan 2022)

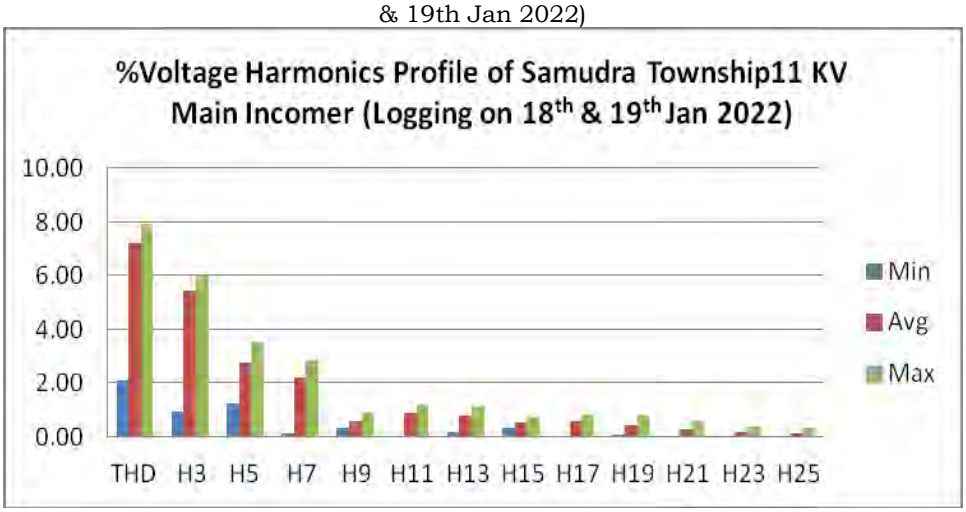


Figure 8 : Ampere Profile of Samundra Township 11 KV Main Incomer (Logging on 18th & 19th Jan 2022)

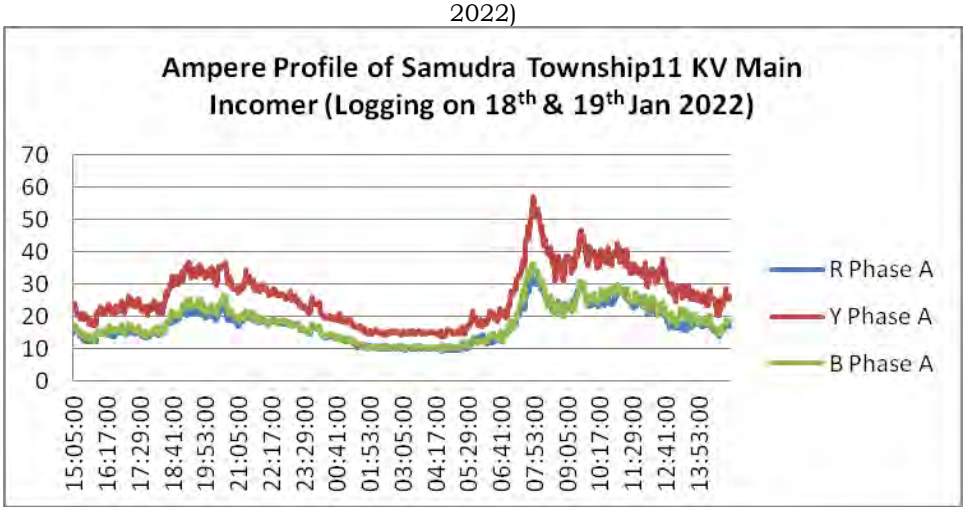


Figure 9 : %Ampere Harmonics Profile of Samundra Township 11 KV Main Incomer (Logging on 18th & 19th Jan 2022)

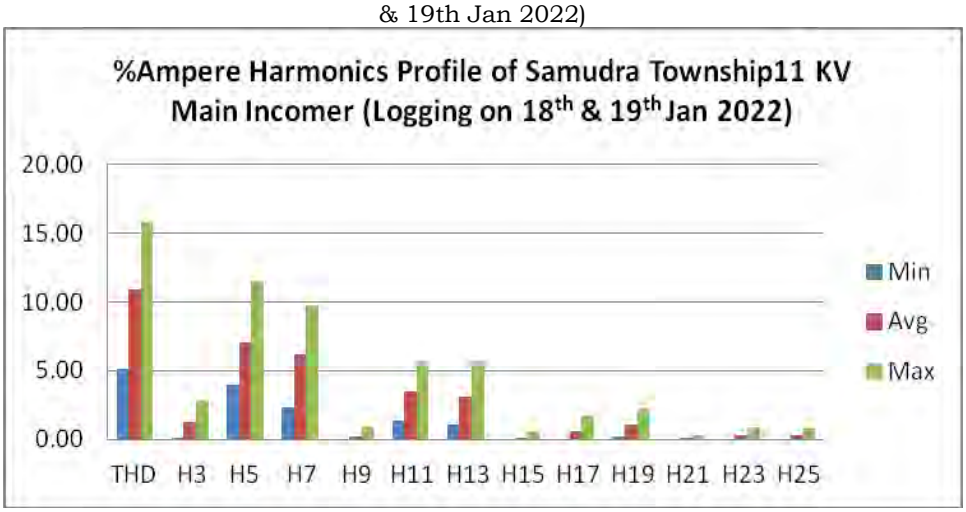


Figure 10 : kW Profile of Samundra Township 11 KV Main Incomer (Logging on 18th & 19th Jan 2022)

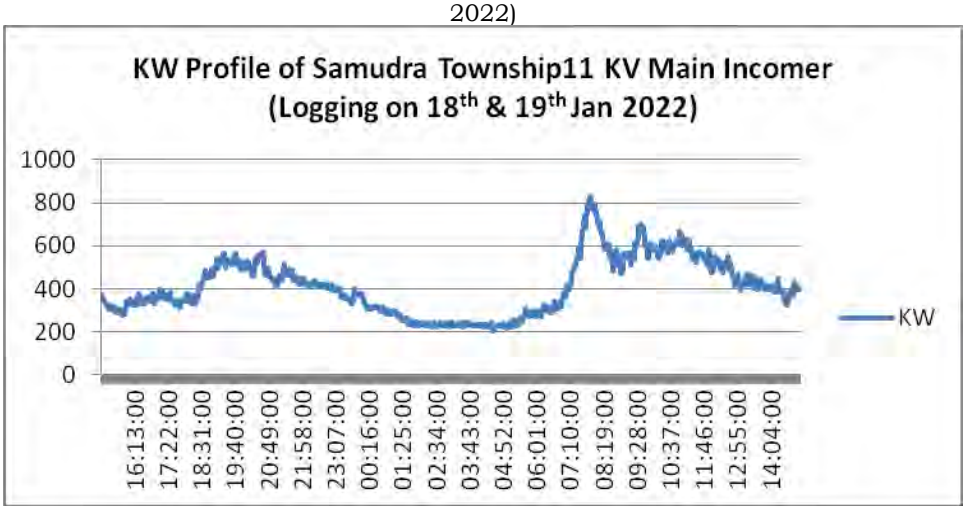


Figure 11 : PF Profile of Samudra Township 11 KV Main Incomer (Logging on 18th & 19th Jan 2022)

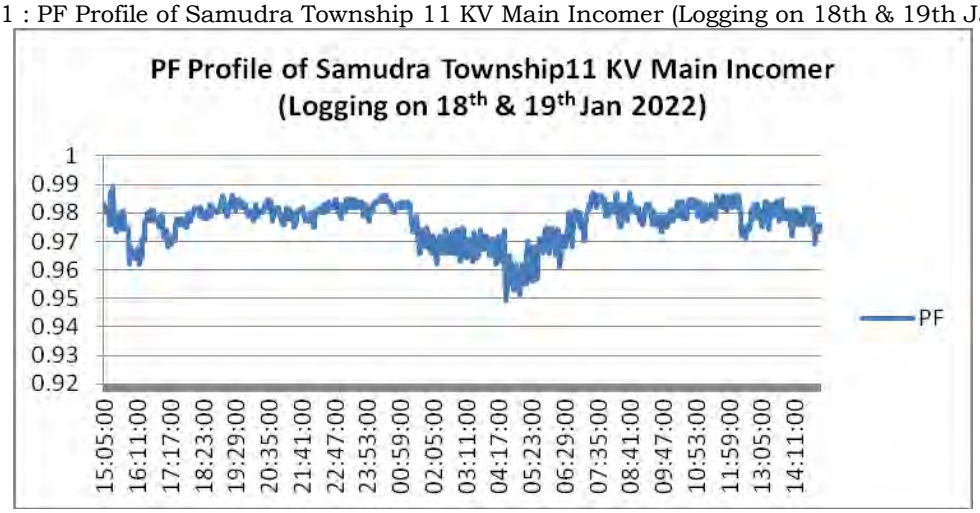
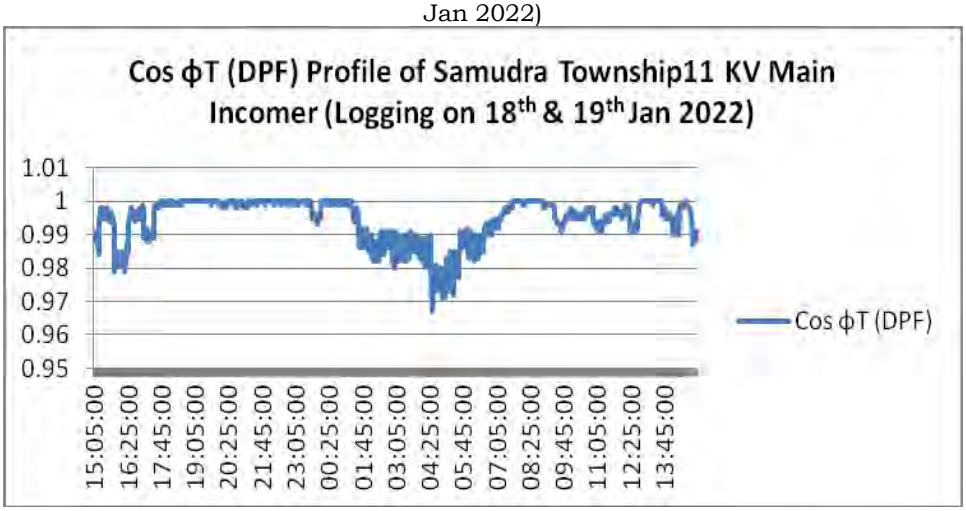


Figure 12 : Cos φT (DPF) Profile of Samudra Township 11 KV Main Incomer (Logging on 18th & 19th Jan 2022)



Location - Samudra Township CSS Transformer for Solar B24			
Date -19/01/2022		Time -02:55:00 PM to 06:36:00 PM	
Parameters	**Minimum**	**Average**	**Maximum**
Voltage (V)			
U12 rms	422.6	425.2	428.1
U23 rms	422.1	424.3	426.8
U31 rms	423.4	425.7	428.2
Voltage (V)			
V1 rms	244.3	245.7	247.3
V2 rms	244.1	245.4	247
V3 rms	243.7	245	246.3
Current			
L1 (A)	13.2	327.6	725.1

Location - Samudra Township CSS Transformer for Solar B24			
L2 (A)	12.5	329.1	729.9
L3 (A)	12	328	727.6
Active Power			
Total (KW)	-0.3	236.7	534
Reactive Power			
Total (KVAR)	8.6	20.9	23.6
Apparent Power			
Total (KVA)	9.3	241.4	534.9
Voltage Unbalance			
Total Uunb (IEEE 112)	0.1	0.2	0.3
Ampere Unbalance			
Total Aunb (IEEE 112)	0	0.7	5.7
Power Factor			
Total	0	0.9	1
Harmonics			
Voltage THD %	1.2	1.6	1.9
Current THD%	2.1	16.2	66.5

Remarks: % Ampere Harmonics Noted 16.2%.

Figure 13 : Voltage Profile of CSS Transformer for Solar A32 Main Incomer (Logging on 19th Jan 2022)

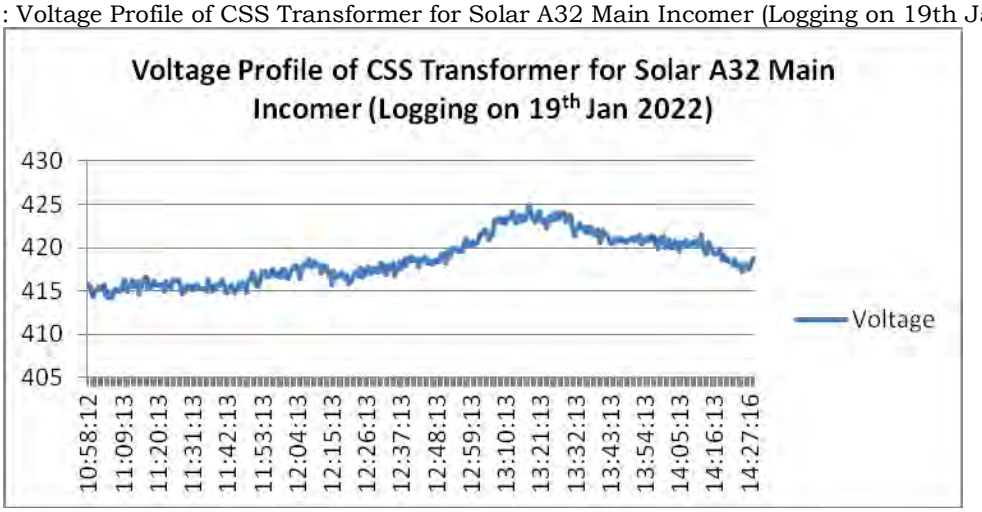


Figure 14 : %Voltage Harmonics Profile of CSS Transformer for Solar A32 Main Incomer (Logging on 19th Jan 2022)

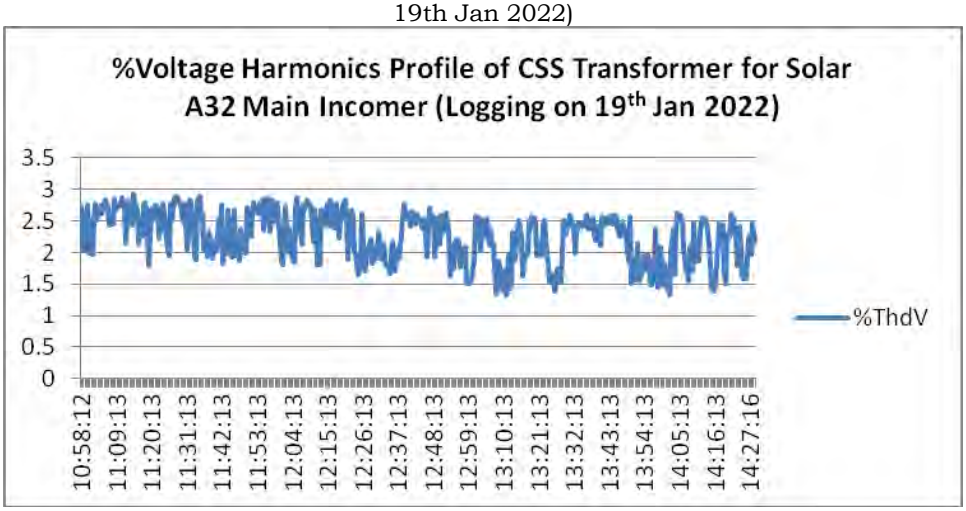


Figure 15 : Ampere Profile of CSS Transformer for Solar A32 Main Incomer (Logging on 19th Jan 2022)

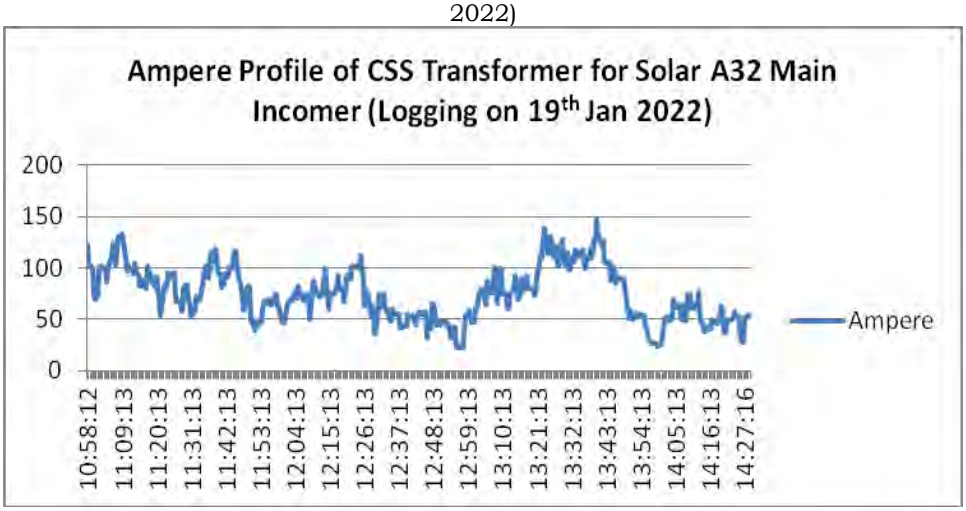


Figure 16 : %Ampere Harmonics Profile of CSS Transformer for Solar A32 Main Incomer (Logging on 19th Jan 2022)

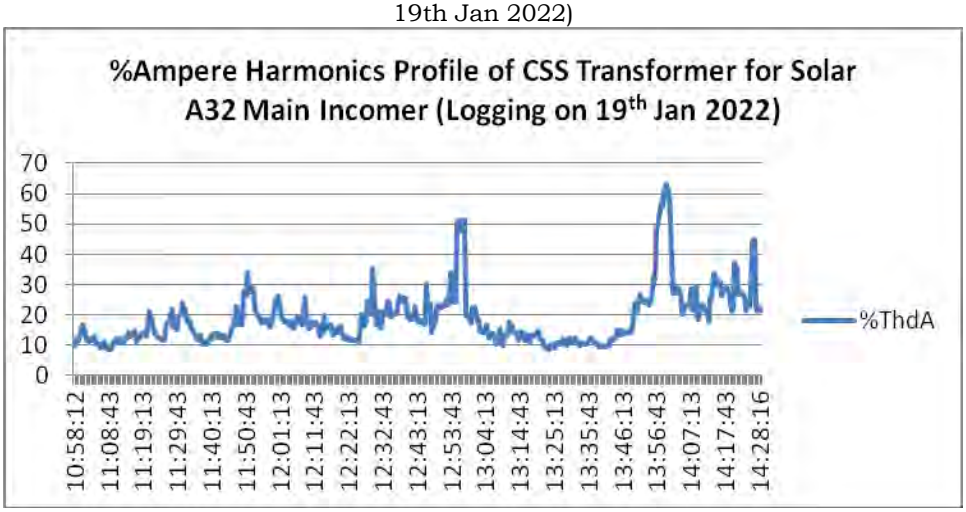


Figure 17 : kW Profile of CSS Transformer for Solar A32 Main Incomer (Logging on 19th Jan 2022)

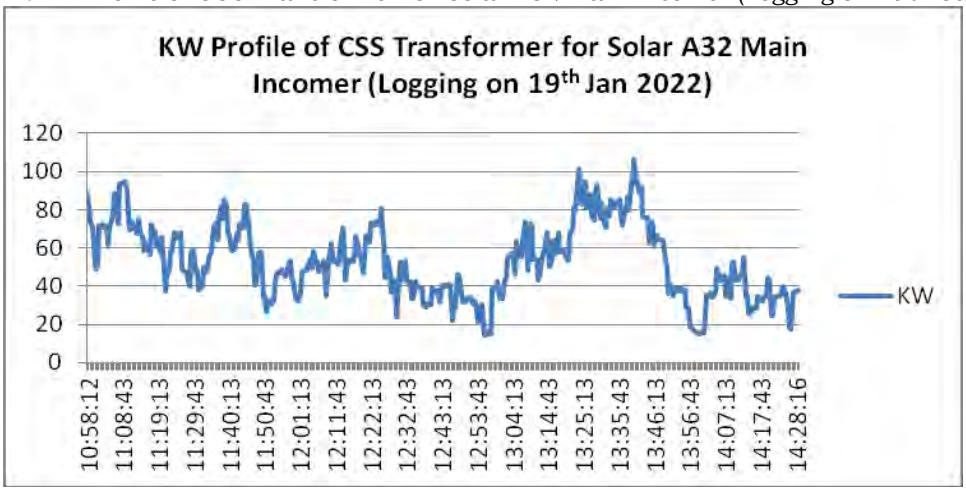
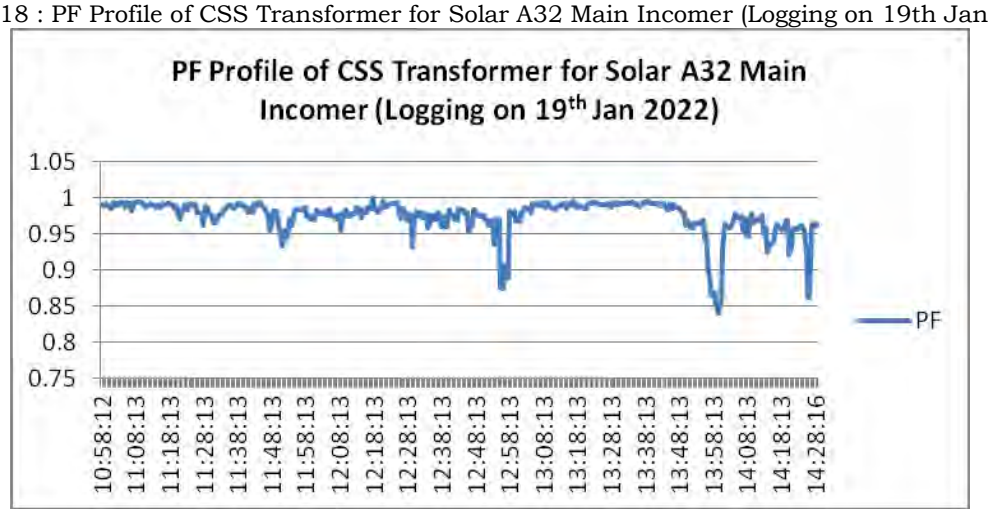


Figure 18 : PF Profile of CSS Transformer for Solar A32 Main Incomer (Logging on 19th Jan 2022)



Location - Samundra Township Transformer B15 (1000 KVA)			
Date -18/01/2022		Time -01:05:00 PM to 02:47:00 PM	
Parameters	**Minimum**	**Average**	**Maximum**
Voltage (V)			
U12 rms	440.1	443.3	446.6
Voltage (V)			
V1 rms	254.33	256.24	258.15
Current			
L1 (A)	109.9	166.1	276.7
Active Power			
Total (KW)	81.4	124.9	211
Reactive Power			
Total (KVAR)	12.4	24.7	31
Apparent Power			

Total (KVA)	84	127.5	212.5
Power Factor			
Total	0.9	1	1
Harmonics			
Voltage THD %	1.7	2.4	3.6
Current THD%	8.8	15.4	22.3

Remarks: This Transformer operate very low load condition during Audit.

Figure 19 : Voltage Profile of Transformer for Block B15 Main Incomer (Logging on 18th Jan 2022)

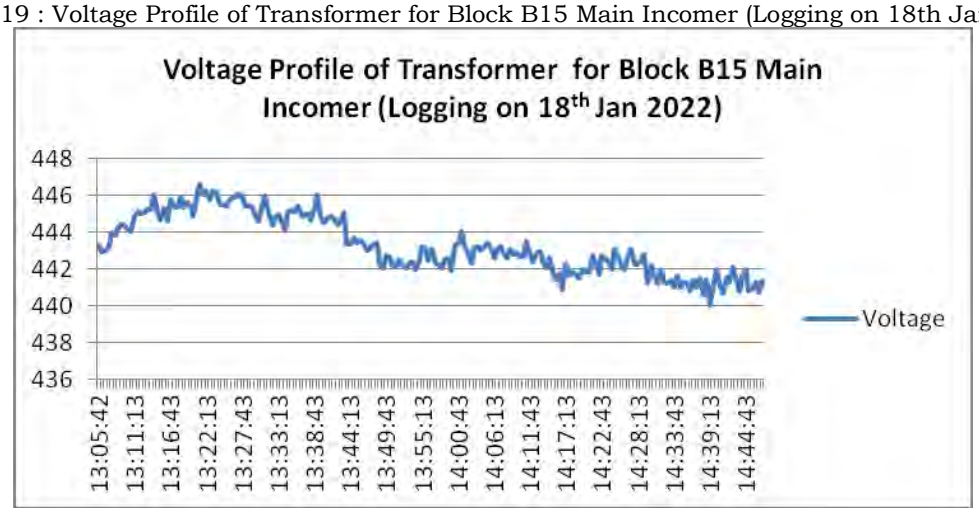


Figure 20 %Voltage Harmonics Profile of Transformer for Block B15 Main Incomer (Logging on 18th Jan 2022)

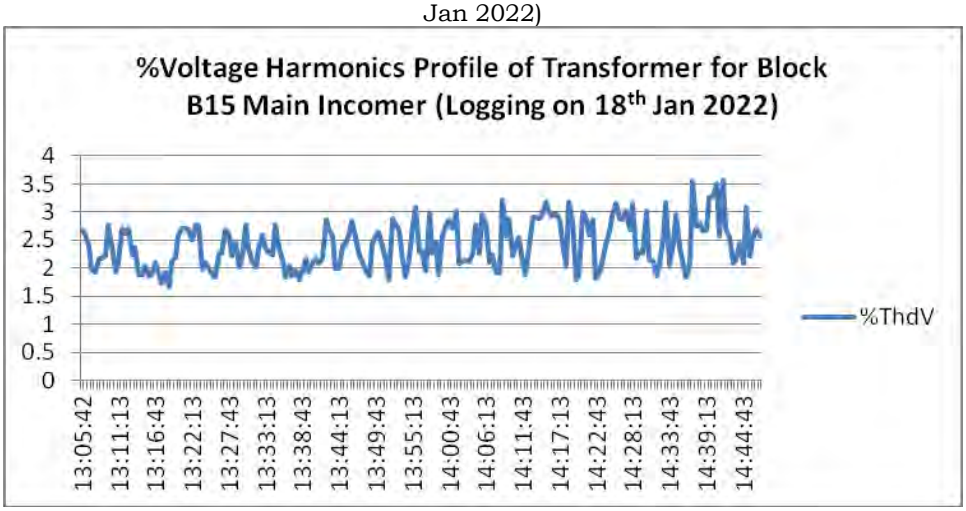


Figure 21 : Ampere Profile of Transformer for Block B15 Main Incomer (Logging on 18th Jan 2022)

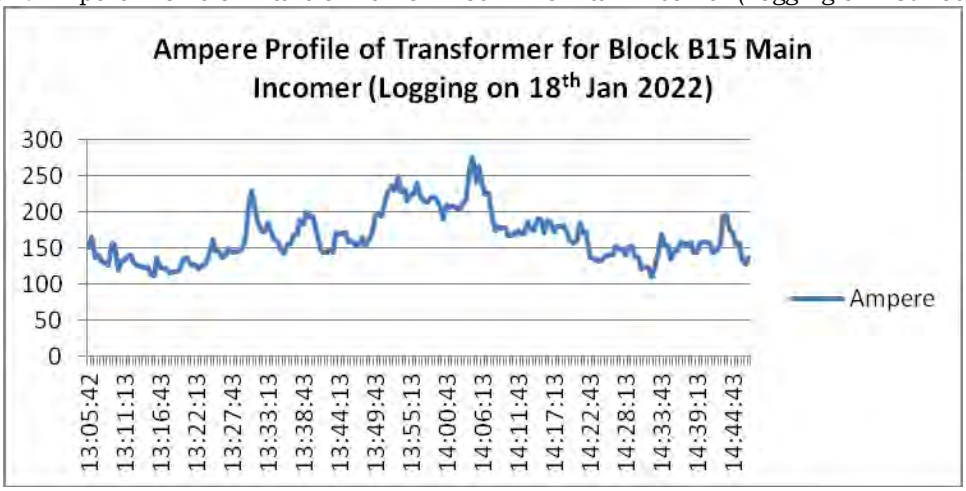


Figure 22 %Ampere Harmonics Profile of Transformer for Block B15 Main Incomer (Logging on 18th Jan 2022)

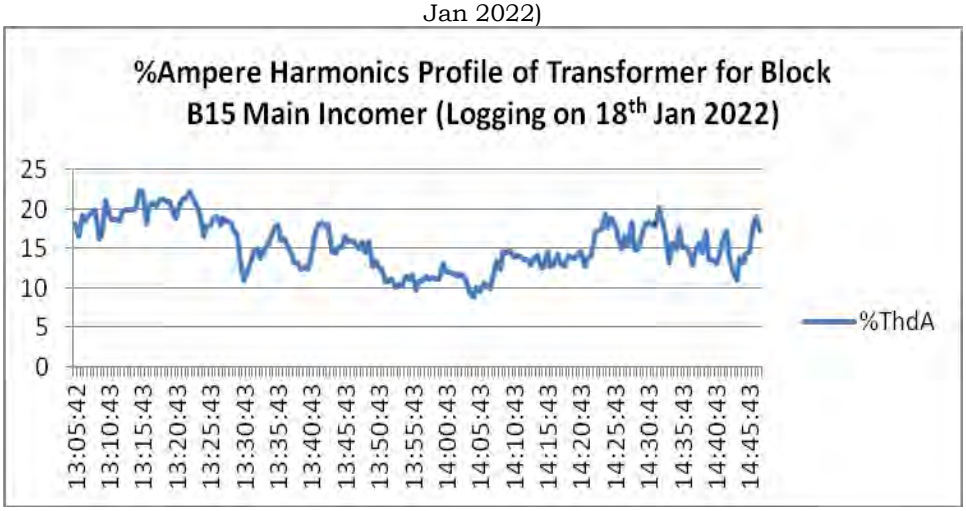


Figure 23 KW Profile of Transformer for Block B15 Main Incomer (Logging on 18th Jan 2022)

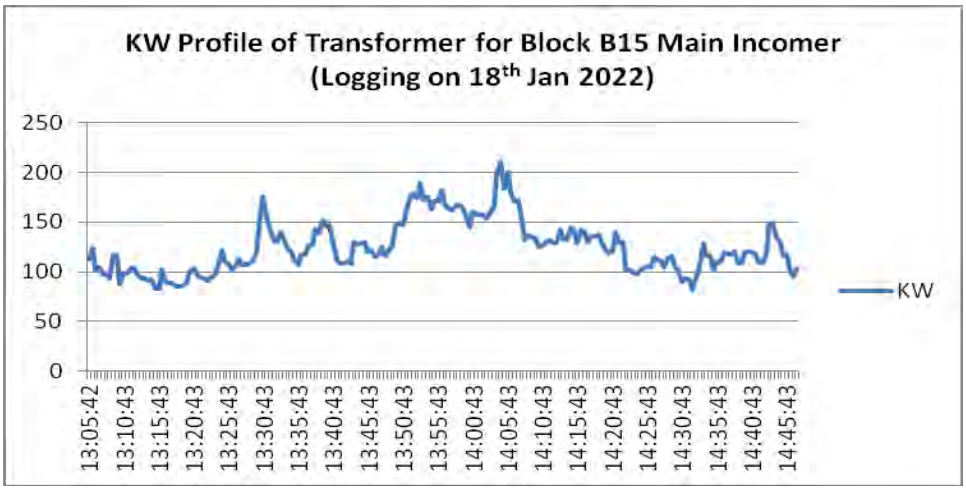
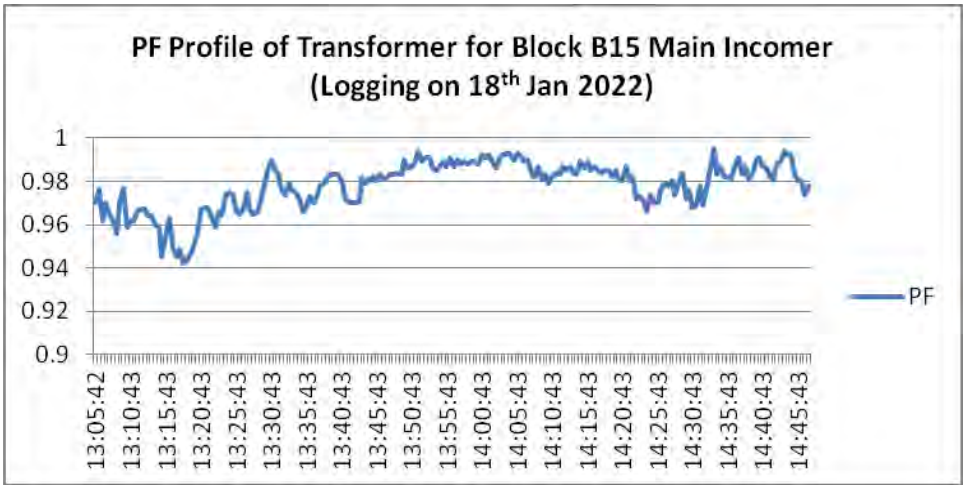


Figure 24 PF Profile of Transformer for Block B15 Main Incomer (Logging on 18th Jan 2022)



Location - Samundra Township Transformer B67 (1000 KVA)			
Date -18/01/2022		Time -05:06:00 PM to 07:04:00 PM	
Parameters	**Minimum**	**Average**	**Maximum**
Voltage (V)			
U12 rms	414	418	420
Voltage (V)			
V1 rms	239	241.6	242.7
Current			
L1 (A)	52.8	86.7	143.2
Active Power			
Total (KW)	32.5	59.2	101.3
Reactive Power			
Total (KVAR)	17.5	20.4	25
Apparent Power			
Total (KVA)	38.3	62.8	103.7
Power Factor			
Total	0.8	0.9	1
Harmonics			
Voltage THD %	1.7	2.3	3
Current THD%	18.5	32.6	51.7

Figure 25 Voltage Profile of Transformer for Block B67 Main Incomer (Logging on 18th Jan 2022)

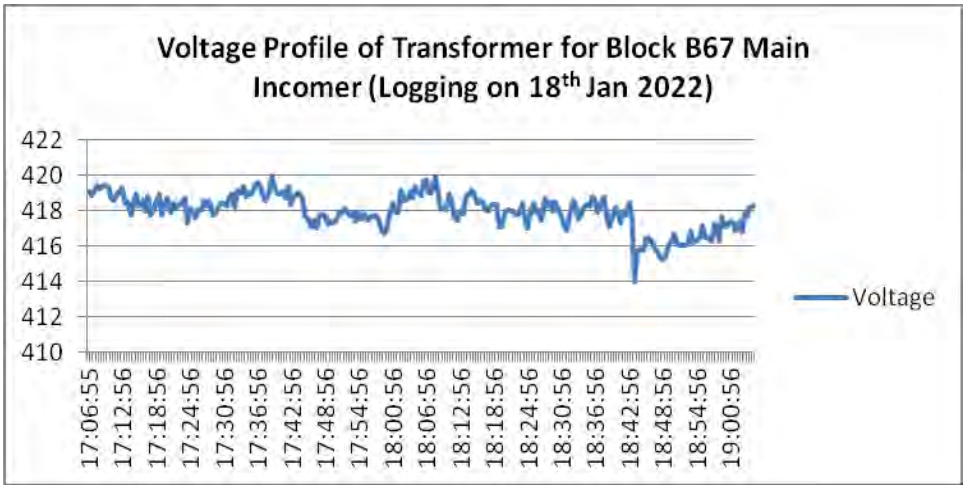


Figure 26 %Voltage Harmonics Profile of Transformer for Block B67 Main Incomer (Logging on 18th Jan 2022)

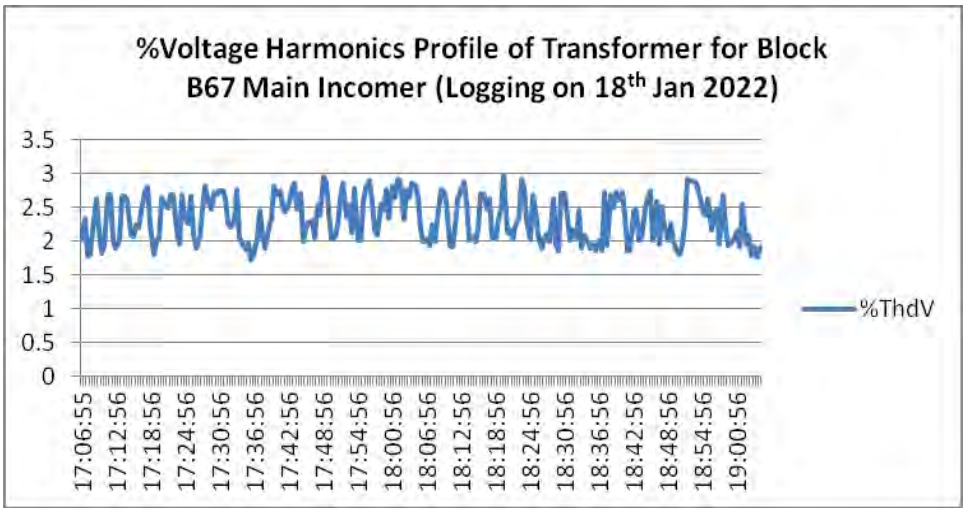


Figure 27 Ampere Profile of Transformer for Block B67 Main Incomer (Logging on 18th Jan 2022)

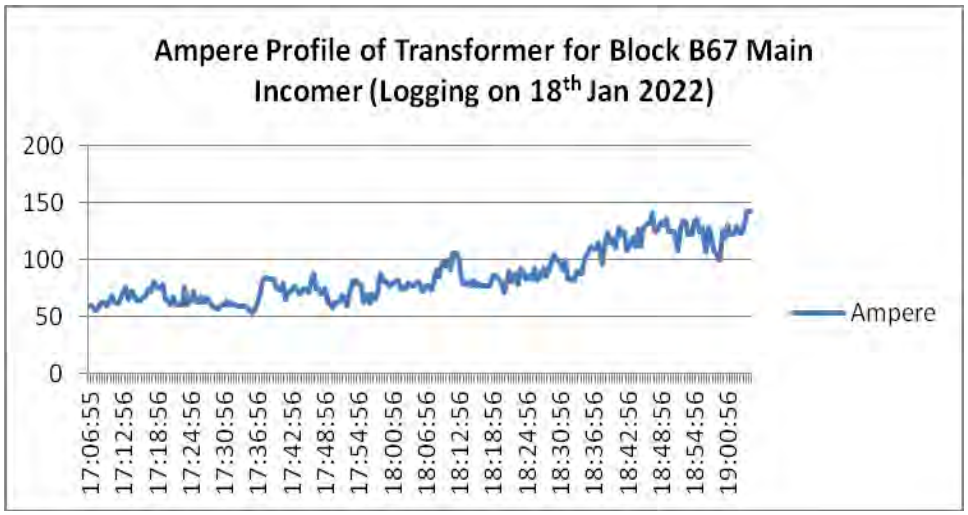


Figure 28 %Ampere Harmonics Profile of Transformer for Block B67 Main Incomer (Logging on 18th Jan 2022)

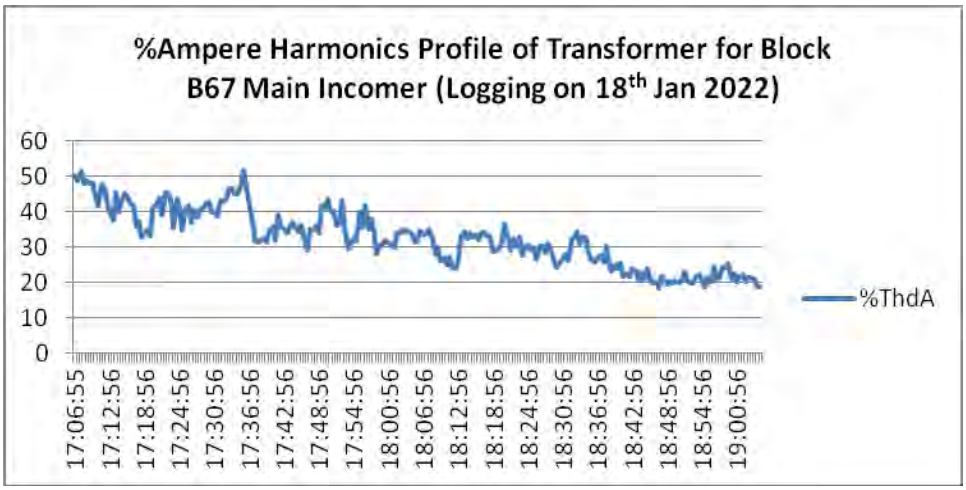


Figure 29 kW Profile of Transformer for Block B67 Main Incomer (Logging on 18th Jan 2022)

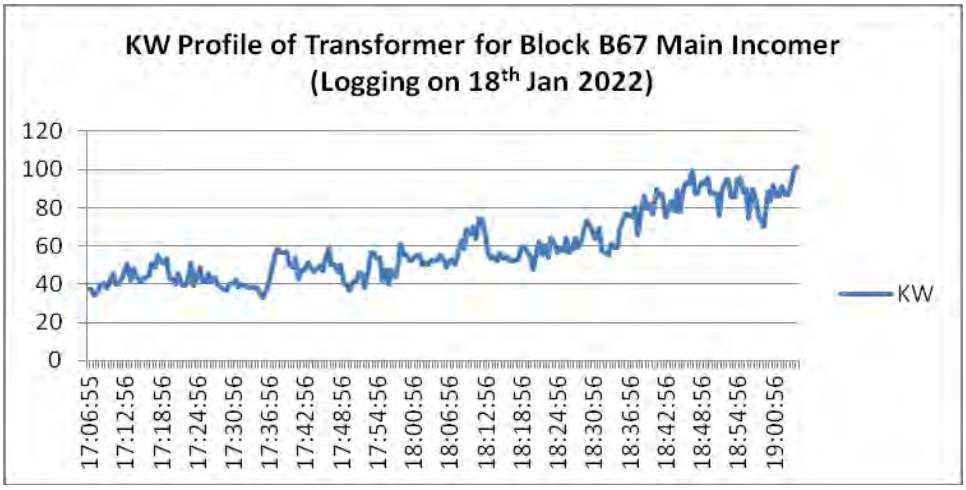
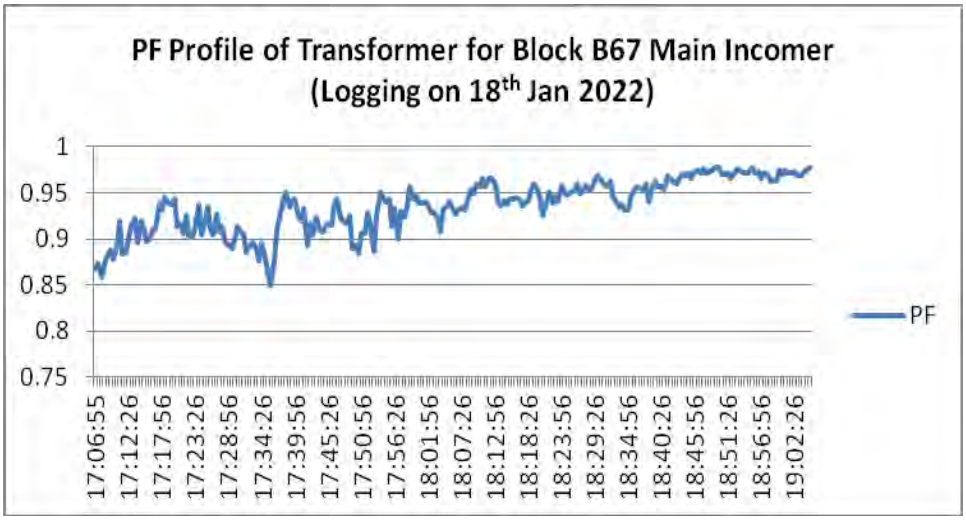


Figure 30 PF Profile of Transformer for Block B67 Main Incomer (Logging on 18th Jan 2022)



Location - CSS Transformer for A18 Samundra Colony			
Date -19/01/2022		Time -03:49:00 PM to 17:14:00 PM	
Parameters	**Minimum**	**Average**	**Maximum**
Voltage (V)			
U12 rms	434.9	437	439.1
Voltage (V)			
V1 rms	251.38	252.6	253.8
Current			
L1 (A)	83.5	207.2	334.5
Active Power			
Total (KW)	59.8	155.1	251.8
Reactive Power			
Total (KVAR)	14.7	21.1	27.3
Apparent Power			
Total (KVA)	63.3	156.8	252.5
Power Factor			
Total	0.9	1	1
Harmonics			
Voltage THD %	1.6	2.3	3.1
Current THD%	1.6	8.2	17.2

Remarks: Average current harmonic is 8.2 %.

Figure 31 Voltage Profile of CSS Transformer for A18 Main Incomer (Logging on 19th Jan 2022)

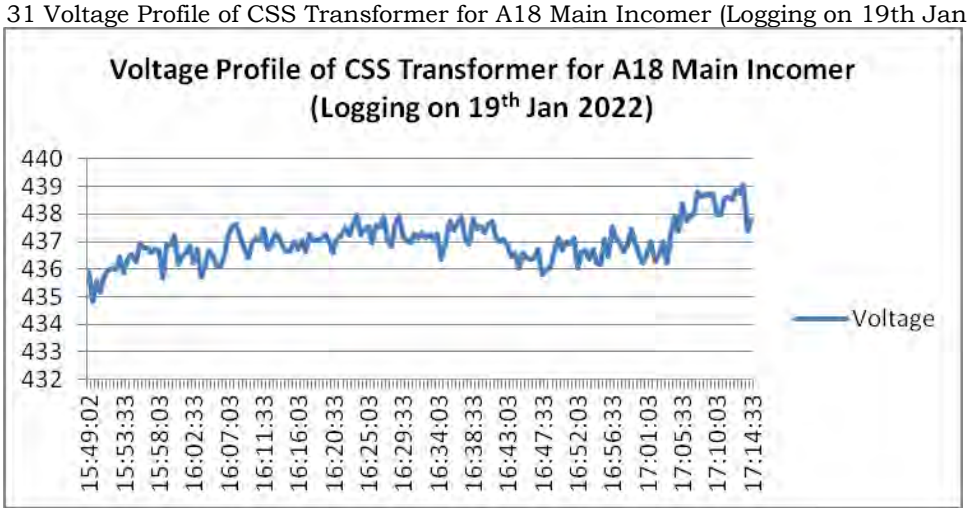


Figure 32 %Voltage Harmonics Profile of CSS Transformer for A18 Main Incomer (Logging on 19th Jan 2022)

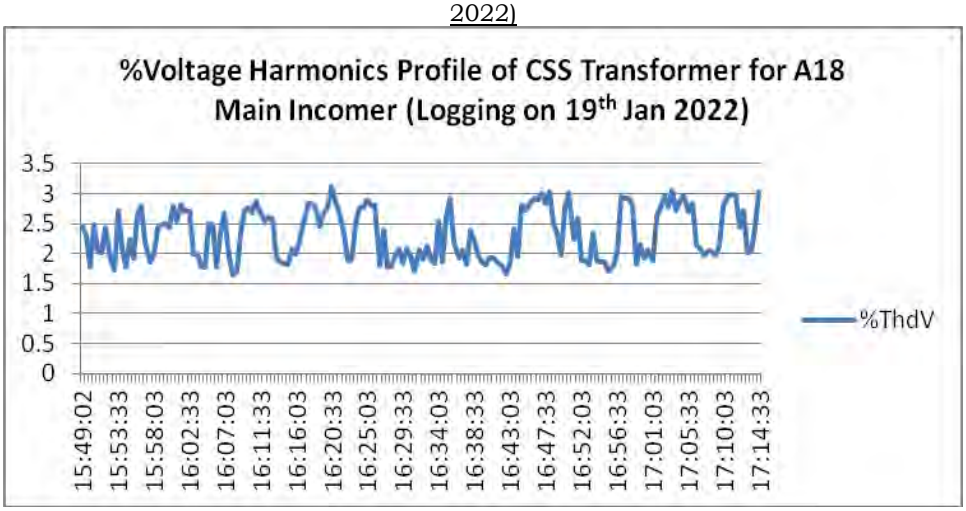


Figure 33 Ampere Profile of CSS Transformer for A18 Main Incomer (Logging on 19th Jan 2022)

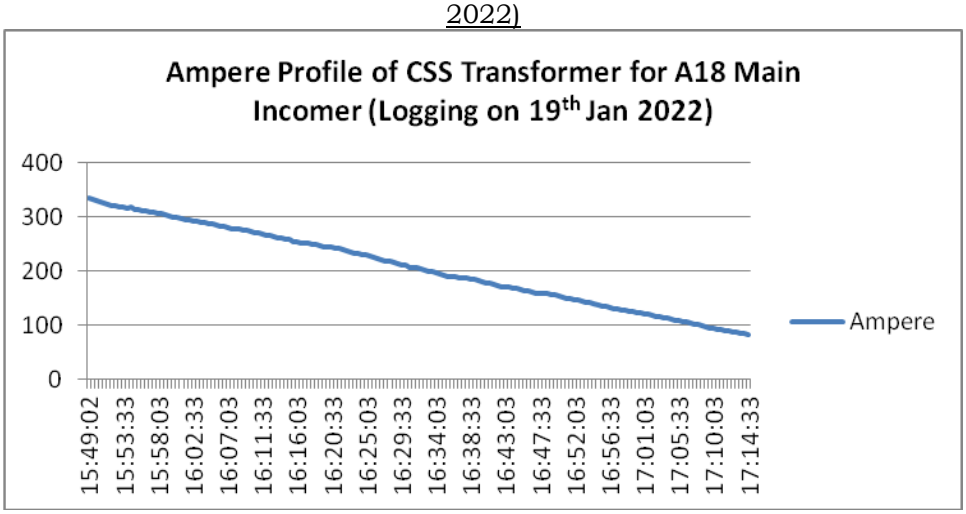
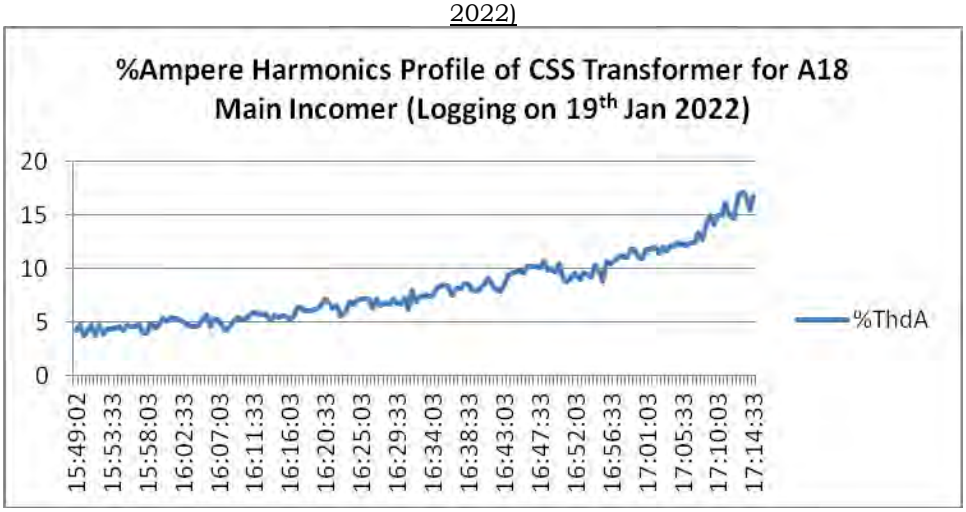


Figure 34 %Ampere Harmonics Profile of CSS Transformer for A18 Main Incomer (Logging on 19th Jan 2022)



Ampere Load decrease with respect % Ampere Harmonics Increase in systems.

Figure 35 kW Profile of CSS Transformer for A18 Main Incomer (Logging on 19th Jan 2022)

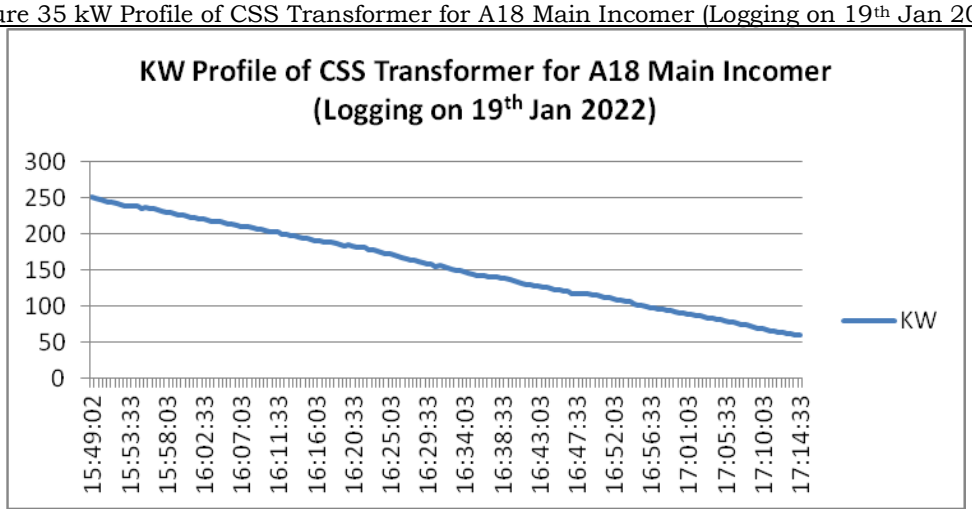
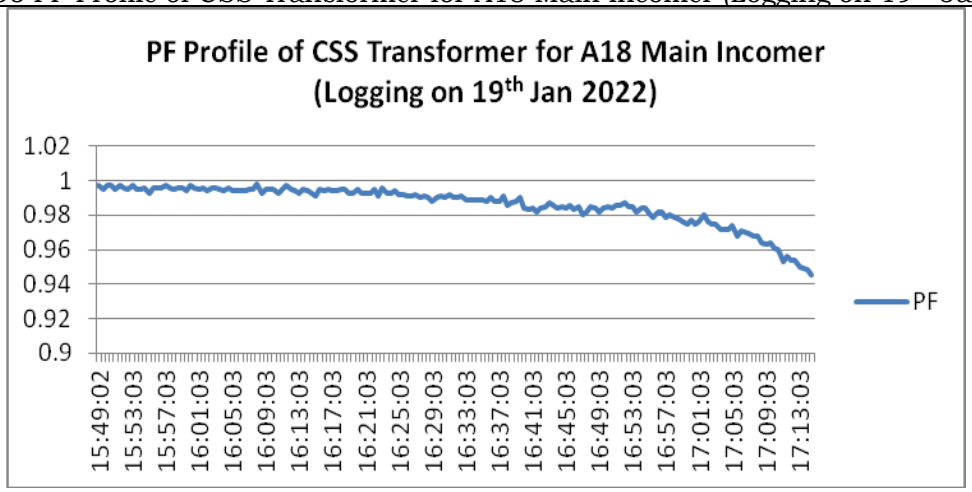


Figure 36 PF Profile of CSS Transformer for A18 Main Incomer (Logging on 19th Jan 2022)



Location - CSS Transformer for Solar A32 Samudra Colony			
Date -19/01/2022		Time -10:58:00 AM to 02:28:00 PM	
Parameters	**Minimum**	**Average**	**Maximum**
Voltage (V)			
U12 rms	414.2	418.7	425
Voltage (V)			
V1 rms	239.4	242	245.6
Current			
L1 (A)	22	74.8	147.3
Active Power			
Total (KW)	14	53.2	106.6
Reactive Power			

Location - CSS Transformer for Solar A32 Samudra Colony			
Total (KVAR)	0	9.7	13.9
Apparent Power			
Total (KVA)	16	54.2	107.3
Power Factor			
Total	0.8	1	1
Harmonics			
Voltage THD %	1.3	2.3	2.9
Current THD%	8.5	18.8	63.1

Remarks: Average % Ampere Harmonics is 18.8 %.

Figure 37 Voltage Profile of CSS Transformer for Solar A32 Main Incomer (Logging on 19th Jan 2022)

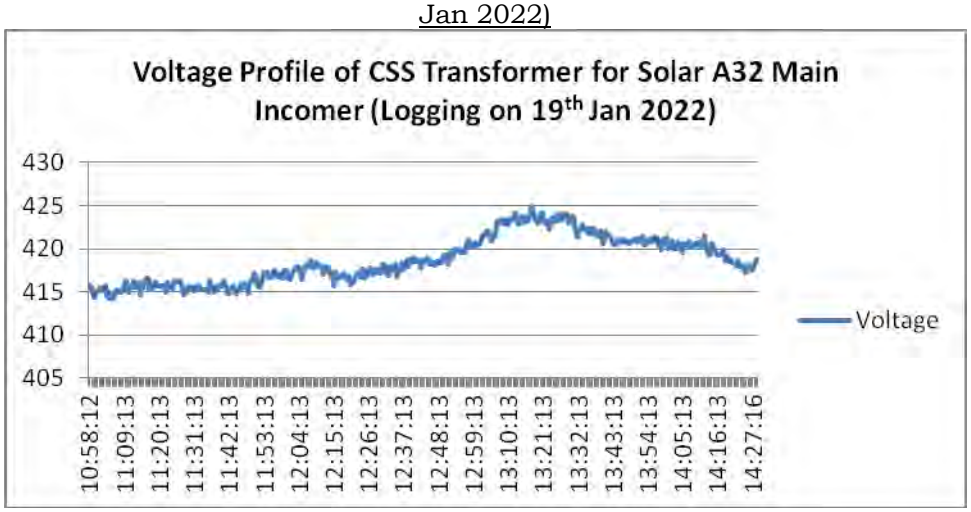


Figure 38 %Voltage Harmonics Profile of CSS Transformer for Solar A32 Main Incomer (Logging on 19th Jan 2022)

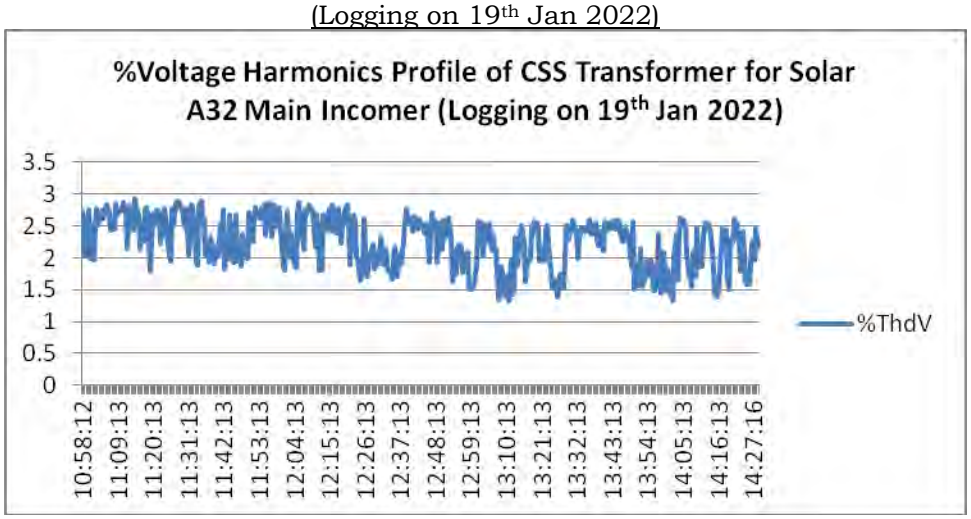


Figure 39 Ampere Profile of CSS Transformer for Solar A32 Main Incomer (Logging on 19th Jan 2022)

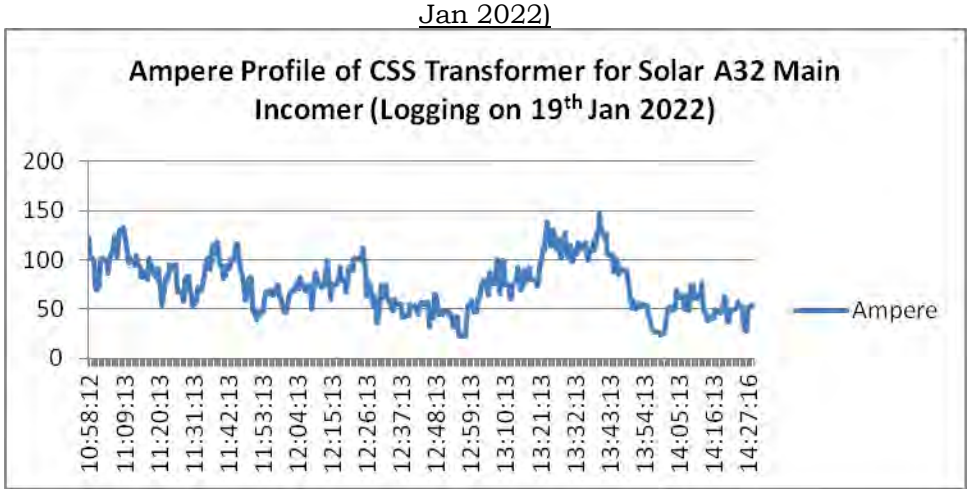


Figure 40 %Ampere Harmonics Profile of CSS Transformer for Solar A32 Main Incomer (Logging on 19th Jan 2022)

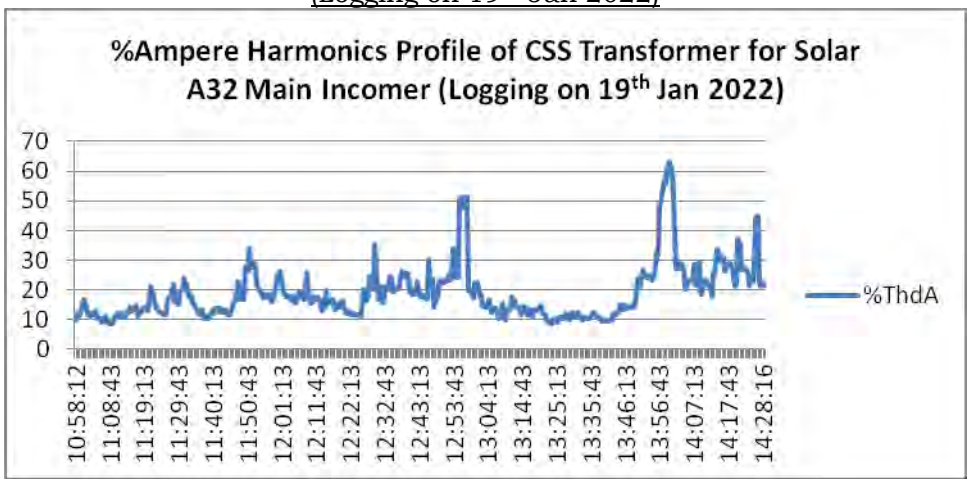


Figure 41 KW Profile of CSS Transformer for Solar A32 Main Incomer (Logging on 19th Jan 2022)

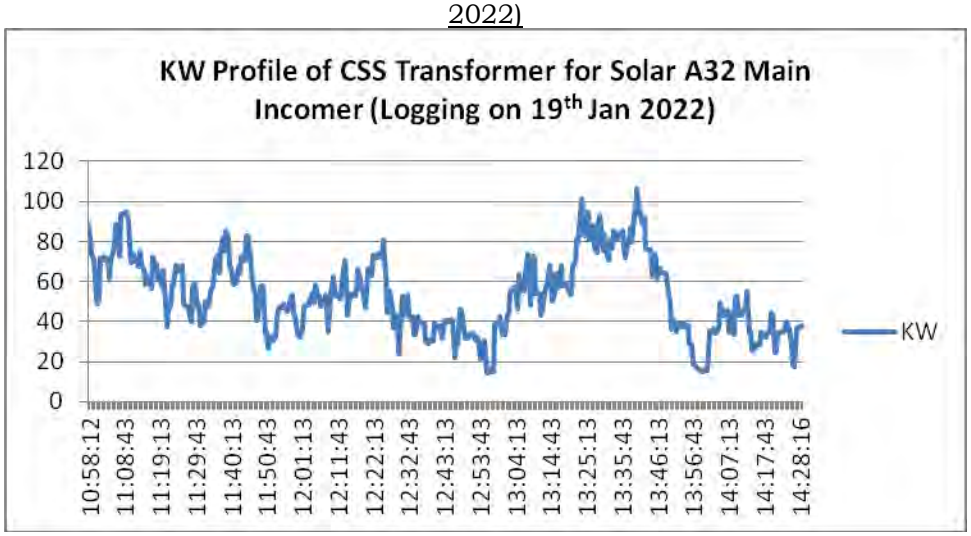
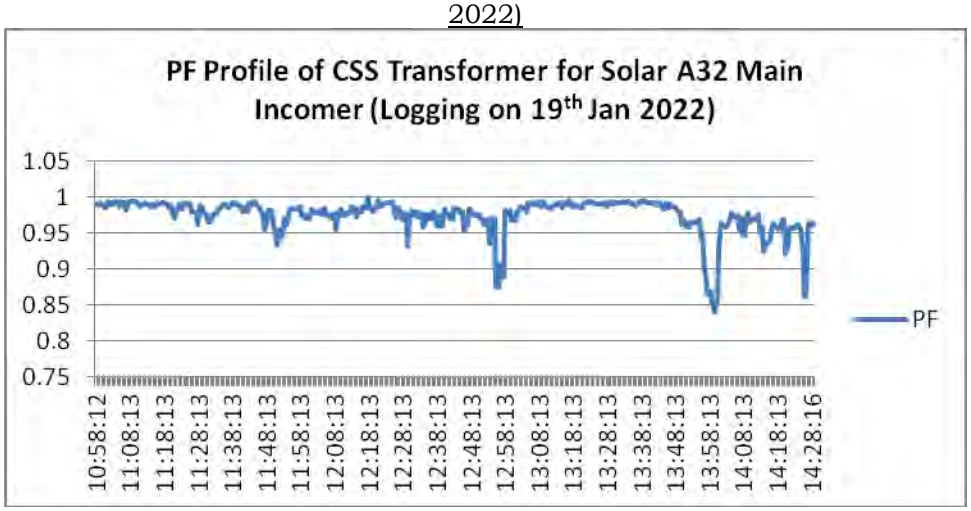


Figure 42 PF Profile of CSS Transformer for Solar A32 Main Incomer (Logging on 19th Jan 2022)



Location - Samundra Township CSS Transformer for Solar B24			
Date -19/01/2022		Time -02:55:00 PM to 06:36:00 PM	
Parameters	**Minimum**	**Average**	**Maximum**
Voltage (V)			
U12 rms	422.6	425.2	428.1
U23 rms	422.1	424.3	426.8
U31 rms	423.4	425.7	428.2
Voltage (V)			
V1 rms	244.3	245.7	247.3
V2 rms	244.1	245.4	247
V3 rms	243.7	245	246.3
Current			
L1 (A)	13.2	327.6	725.1
L2 (A)	12.5	329.1	729.9
L3 (A)	12	328	727.6
Active Power			
Total (KW)	-0.3	236.7	534
Reactive Power			
Total (KVAR)	8.6	20.9	23.6
Apparent Power			
Total (KVA)	9.3	241.4	534.9
Voltage Unbalance			
Total Uunb (IEEE 112)	0.1	0.2	0.3

Ampere Unbalance			
Total Aunb (IEEE 112)	0	0.7	5.7
Power Factor			
Total	0	0.9	1
Harmonics			
Voltage THD %	1.2	1.6	1.9
Current THD%	2.1	16.2	66.5

Remarks: Average % Ampere Harmonics is 16.2%. when solar generation decrease that time ampere harmonics increase

Figure 43 Voltage Profile of CSS Transformer for Solar B24 Main Incomer (Logging on 19th Jan 2022)

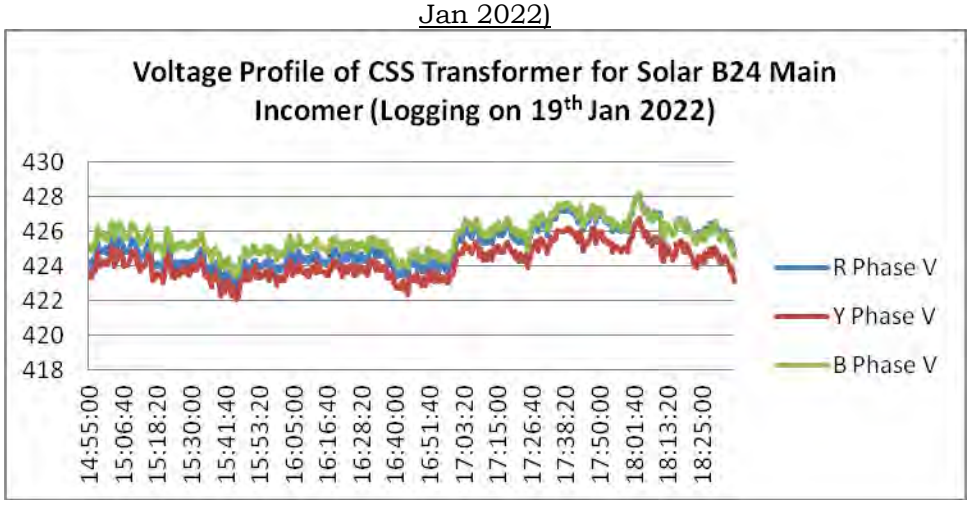


Figure 44 %Voltage Harmonics Profile of CSS Transformer for Solar B24 Main Incomer (Logging on 19th Jan 2022)

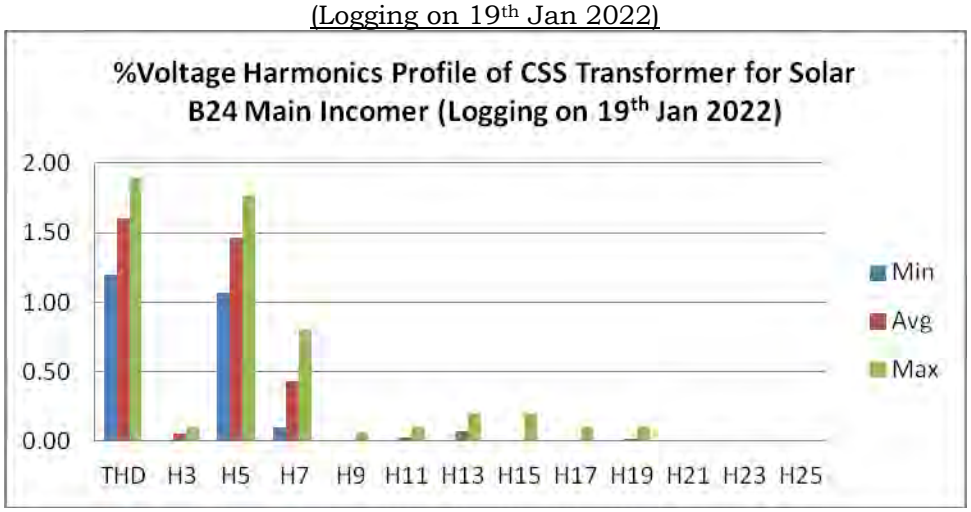


Figure 45 Ampere Profile of CSS Transformer for Solar B24 Main Incomer (Logging on 19th Jan 2022)

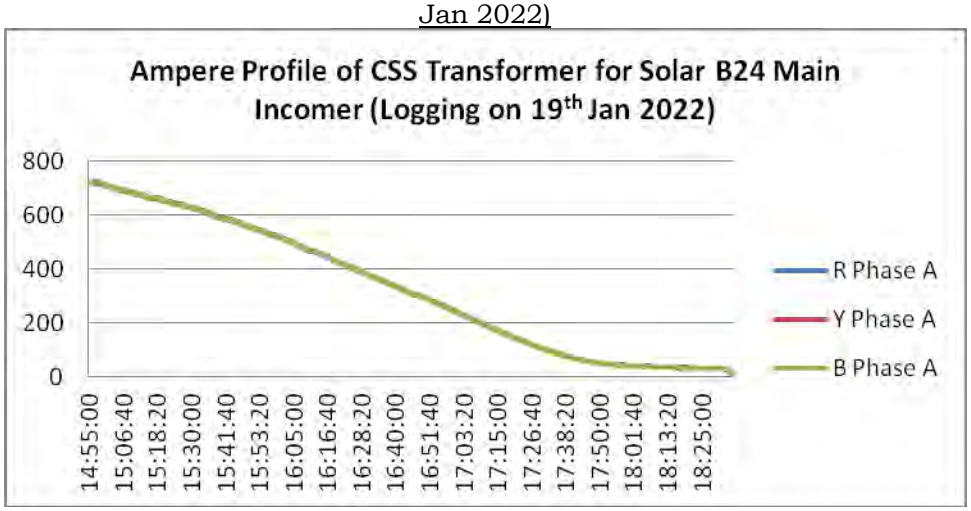


Figure 46 %Ampere Harmonics Profile of CSS Transformer for Solar B24 Main Incomer (Logging on 19th Jan 2022)

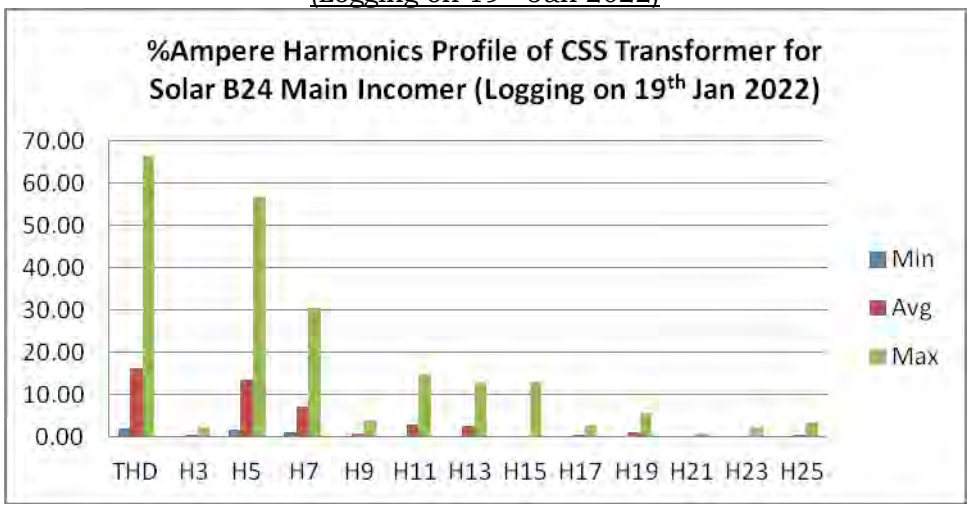


Figure 47 KW Profile of CSS Transformer for Solar B24 Main Incomer (Logging on 19th Jan 2022)

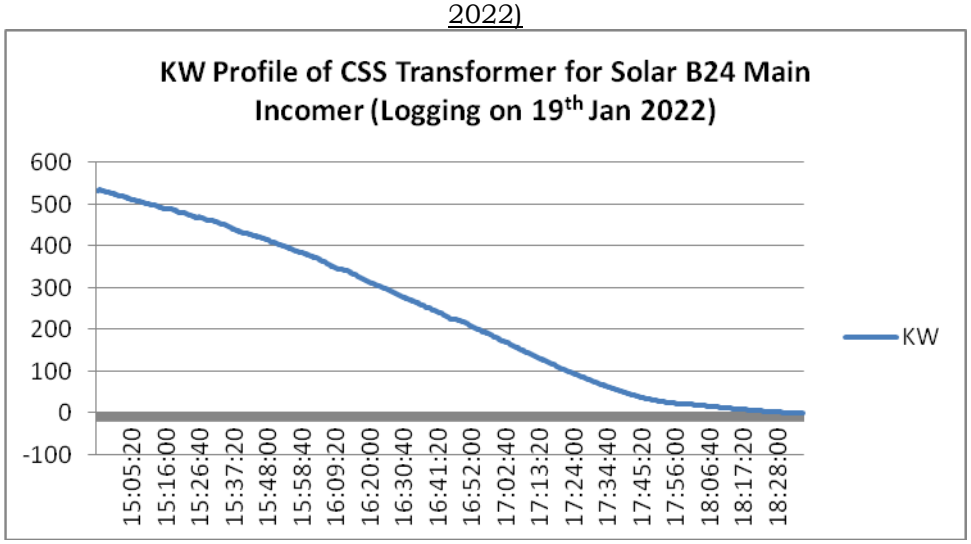


Figure 48 PF Profile of CSS Transformer for Solar B24 Main Incomer (Logging on 19th Jan 2022)

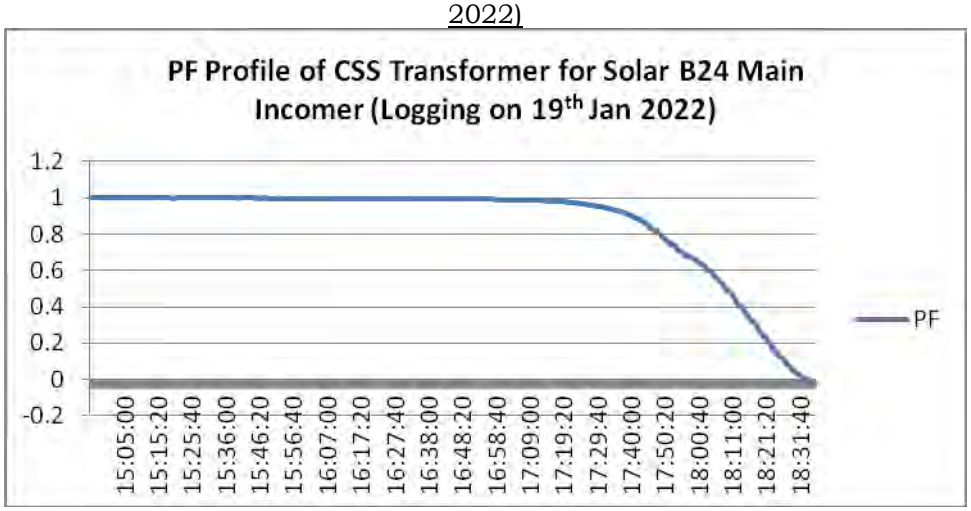
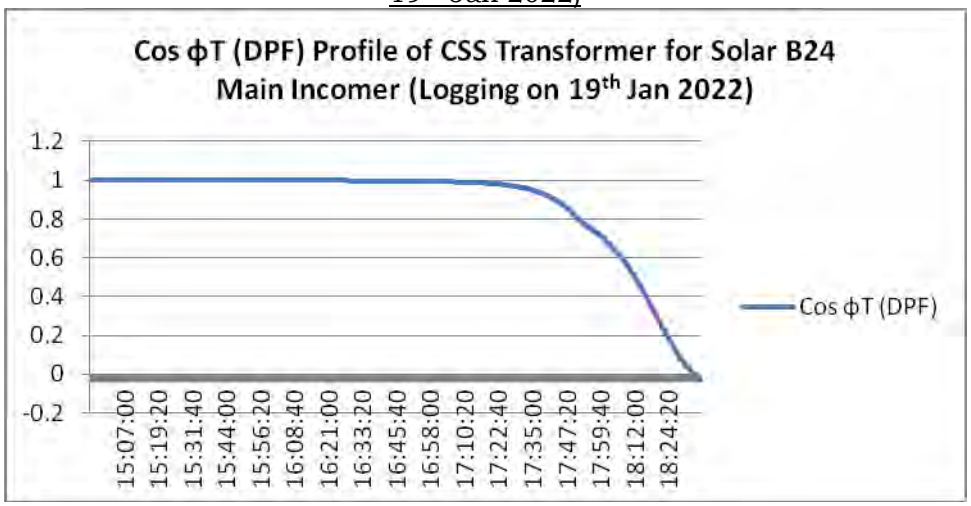


Figure 49 Cos φT (DPF) Profile of CSS Transformer for Solar B24 Main Incomer (Logging on 19th Jan 2022)



Location - Samudra Township Transformer for C1 Block			
Date -18/01/2022 to 19/01/2022		Time -07:42:00 PM to 10:10:00 AM	
Parameters	**Minimum**	**Average**	**Maximum**
Voltage (V)			
U12 rms	409.6	415.3	420.6
U23 rms	411.3	415.8	421
U31 rms	408.8	413.6	418.3
Voltage (V)			
V1 rms	235.7	238.8	241.6
V2 rms	237.3	240.5	243.6
V3 rms	236.9	239.3	242.1
Current			

Location - Samudra Township Transformer for C1 Block			
L1 (A)	23.1	42.7	160.6
L2 (A)	11	24.6	79.6
L3 (A)	17.5	39	97.2
Active Power			
Total (KW)	12.4	25	65.6
Reactive Power			
Total (KVAR)	-3.2	-0.9	5
Apparent Power			
Total (KVA)	13.2	25.5	65.9
Voltage Unbalance			
Total Uunb (IEEE 112)	0.3	0.4	0.5
Ampere Unbalance			
Total Aunb (IEEE 112)	1.1	36.4	90.8
Power Factor			
Total	0.9	1	1
Harmonics			
Voltage THD %	1.1	1.4	2.1
Current THD%	5.2	18.4	36.4

Remarks: Phase wise Load unbalance found. Suggest single phase load balance properly. Average 36.4 % load unbalance found.
Average % Ampere Harmonics is 18.4 %.

Figure 50 Voltage Profile of C1 Block Transformer (Day Time) Main Incomer (Logging on 18th Jan 2022)

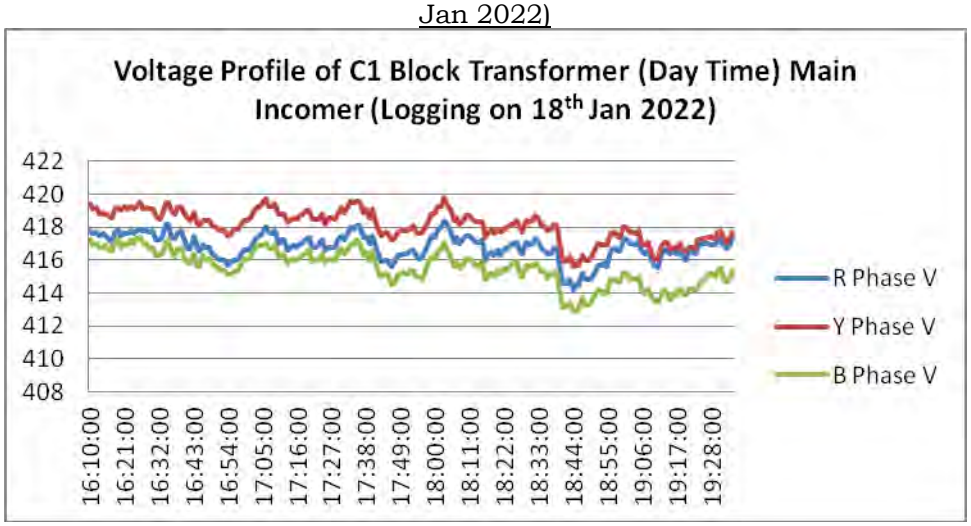


Figure 51 %Voltage Harmonics Profile of C1 Block Transformer (Day Time) Main Incomer (Logging on 18th Jan 2022)

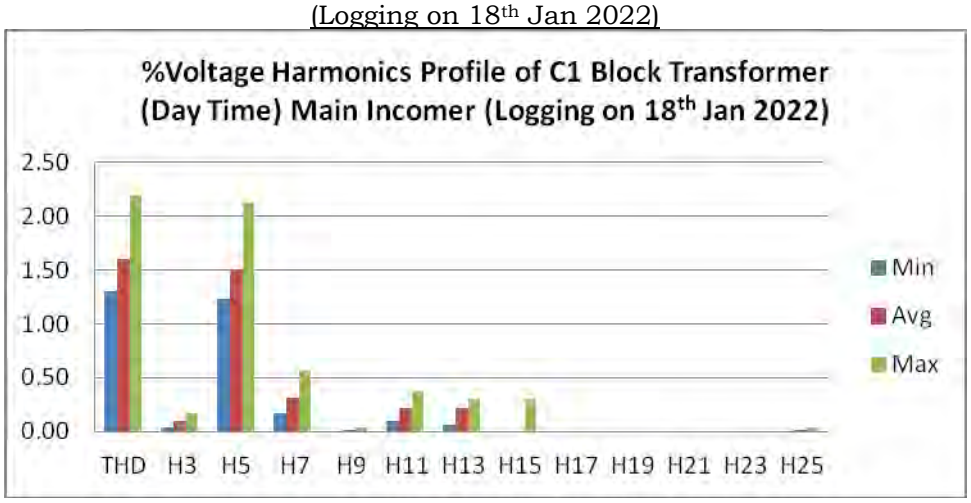


Figure 52 Ampere Profile of C1 Block Transformer (Day Time) Main Incomer (Logging on 18th Jan 2022)

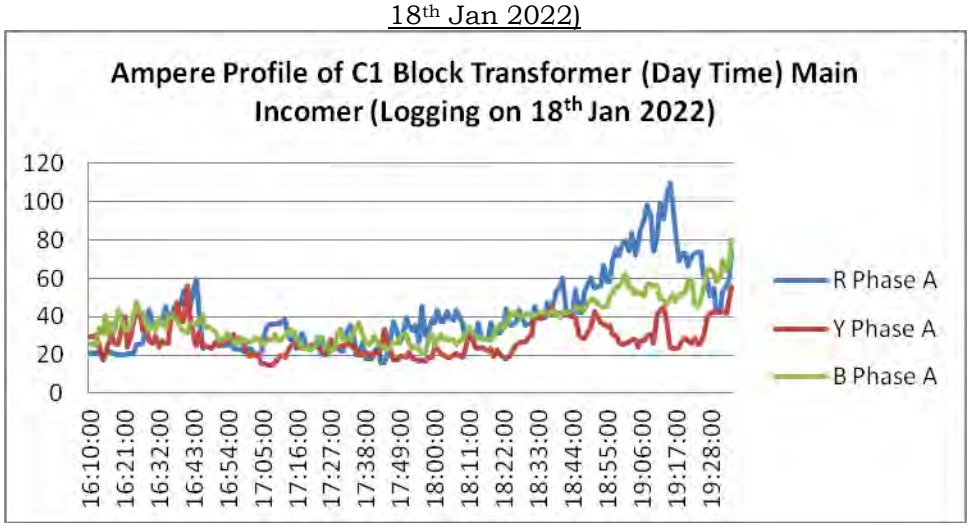


Figure 53 %Ampere Harmonics Profile of C1 Block Transformer (Day Time) Main Incomer (Logging on 18th Jan 2022)

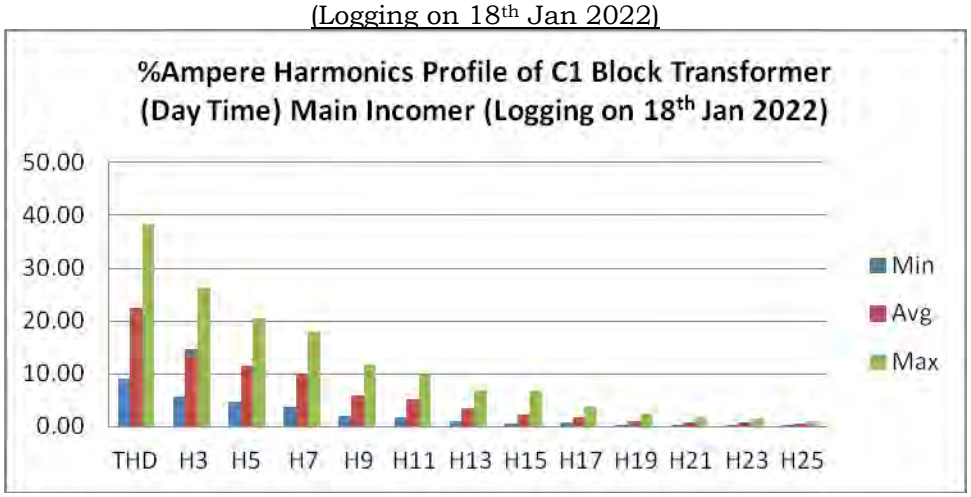


Figure 54 KW Profile of C1 Block Transformer (Day Time) Main Incomer (Logging on 18th Jan 2022)

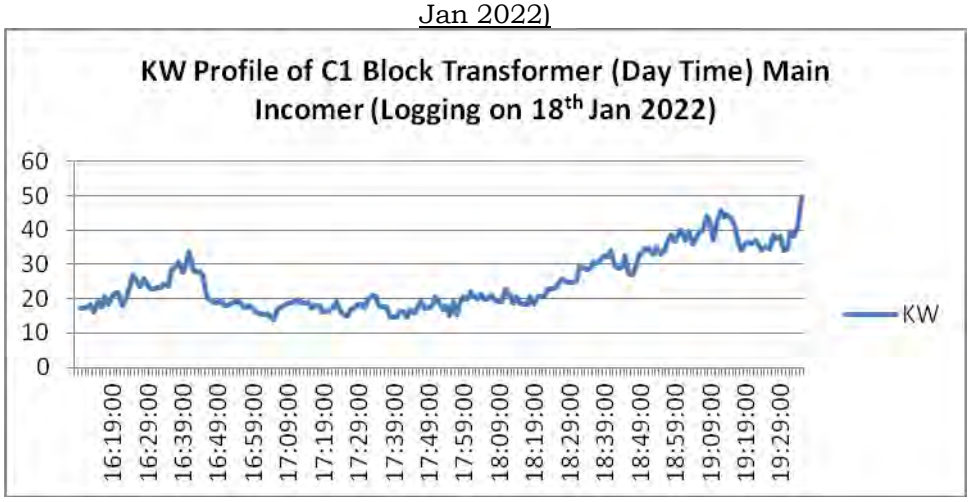


Figure 55 PF Profile of C1 Block Transformer (Day Time) Main Incomer (Logging on 18th Jan 2022)

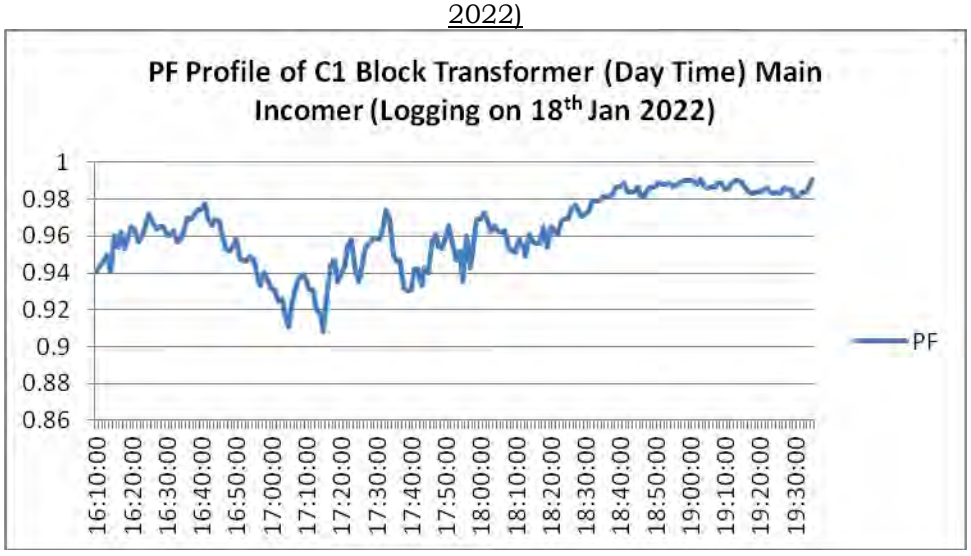


Figure 56 Cos φT (DPF) Profile of C1 Block Transformer (Day Time) Main Incomer (Logging on 18th Jan 2022)

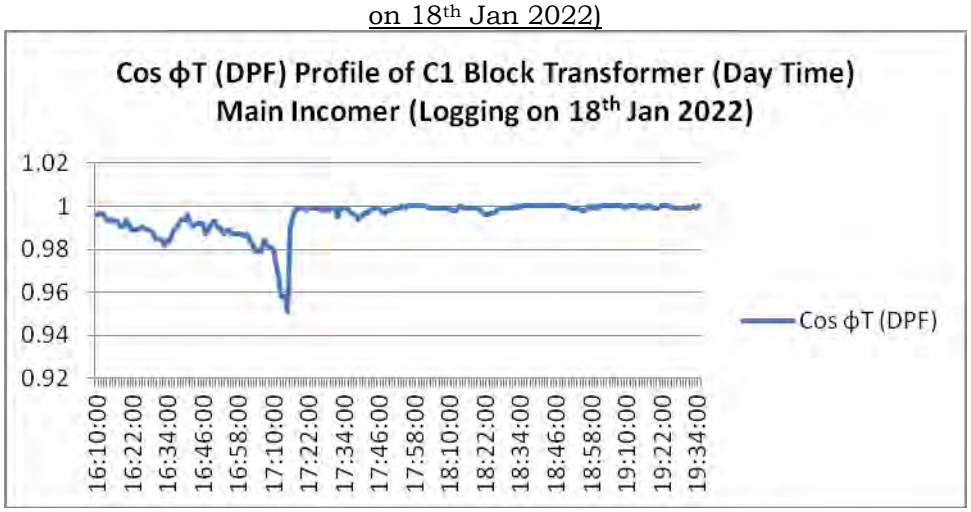


Figure 57 Voltage Profile of C1 Block Transformer (Night Time) Main Incomer (Logging on 18th & 19th Jan 2022)

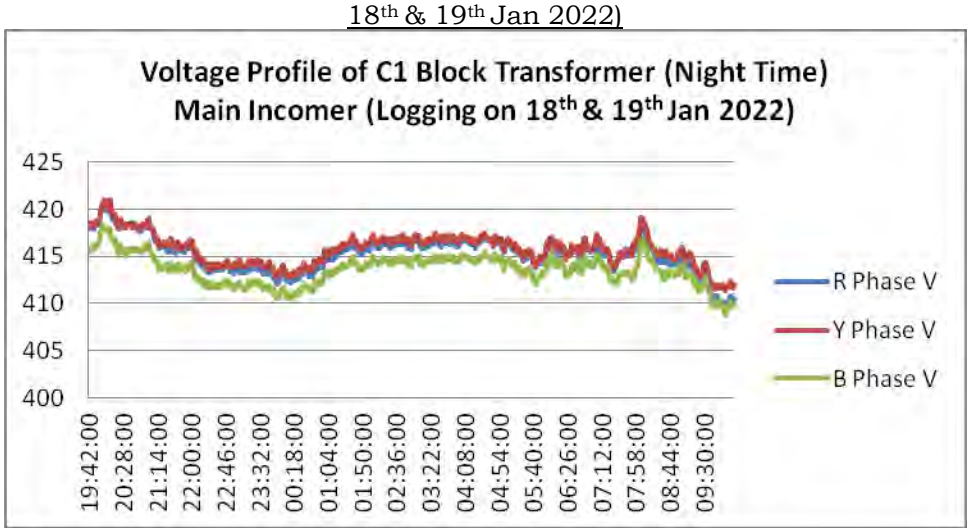


Figure 58 %Voltage Harmonics Profile of C1 Block Transformer (Night Time) Main Incomer (Logging on 18th & 19th Jan 2022)

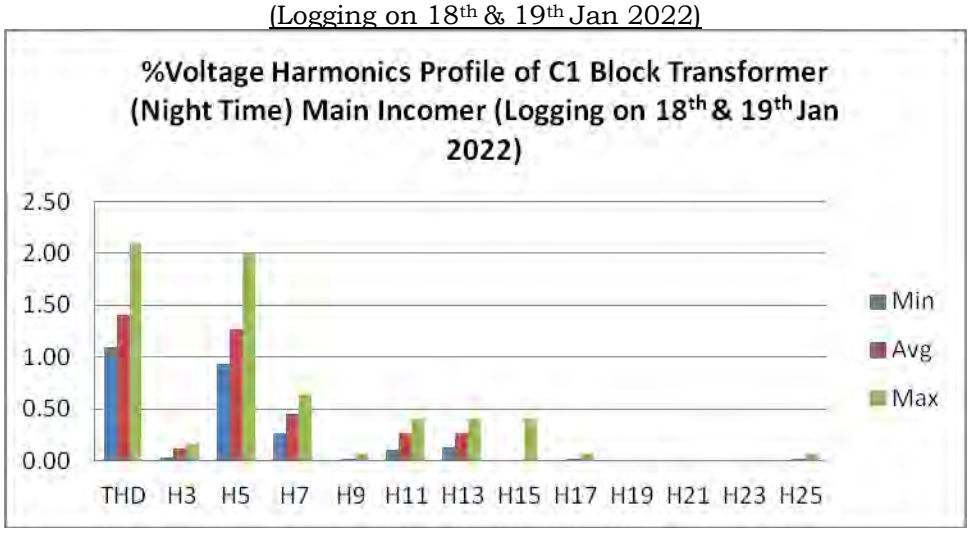


Figure 59 Ampere Profile of C1 Block Transformer (Night Time) Main Incomer (Logging on 18th & 19th Jan 2022)

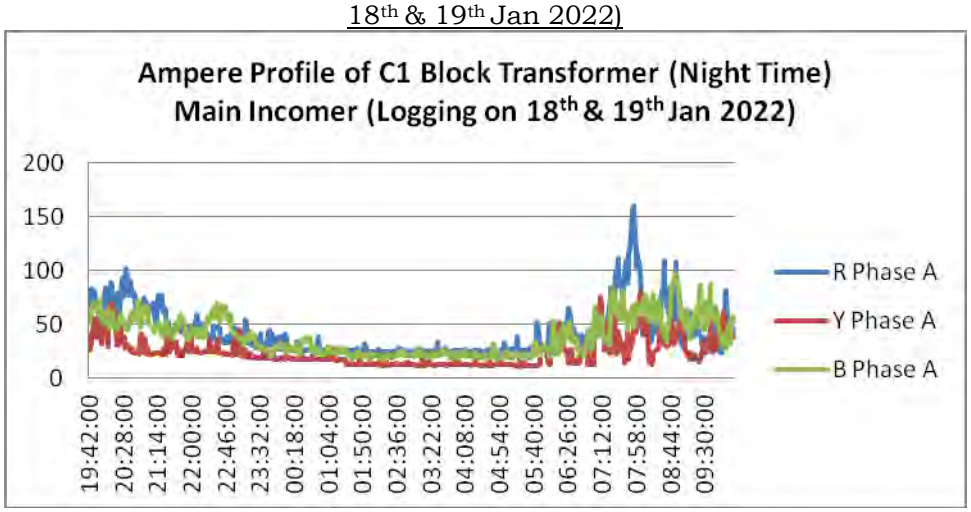


Figure 60 %Ampere Harmonics Profile of C1 Block Transformer (Night Time) Main Incomer (Logging on 18th & 19th Jan 2022)

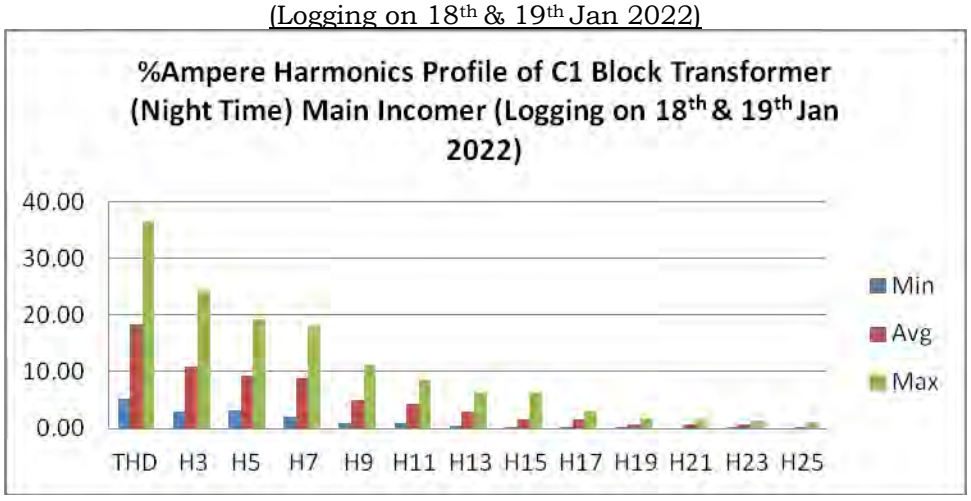


Figure 61 KW Profile of C1 Block Transformer (Night Time) Main Incomer (Logging on 18th & 19th Jan 2022)

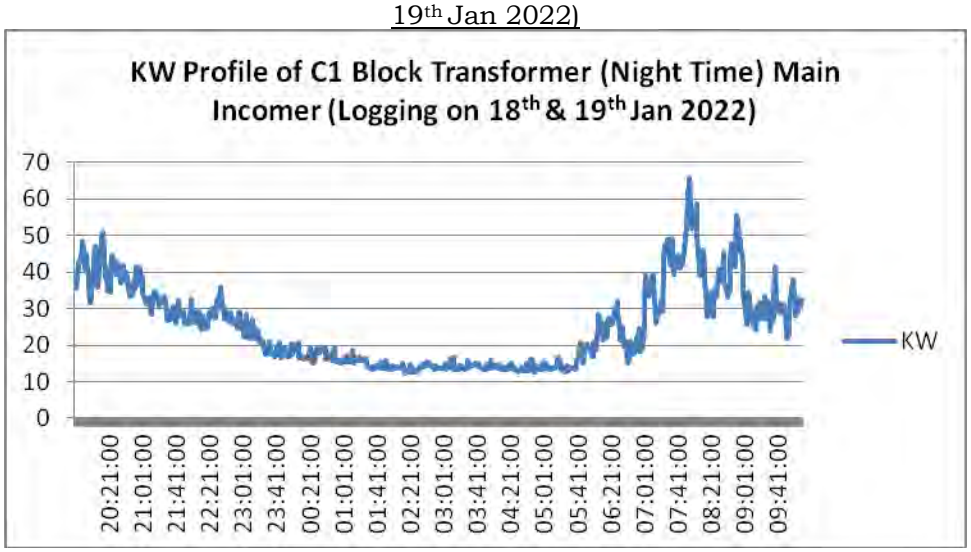


Figure 62 PF Profile of C1 Block Transformer (Night Time) Main Incomer (Logging on 18th & 19th Jan 2022)

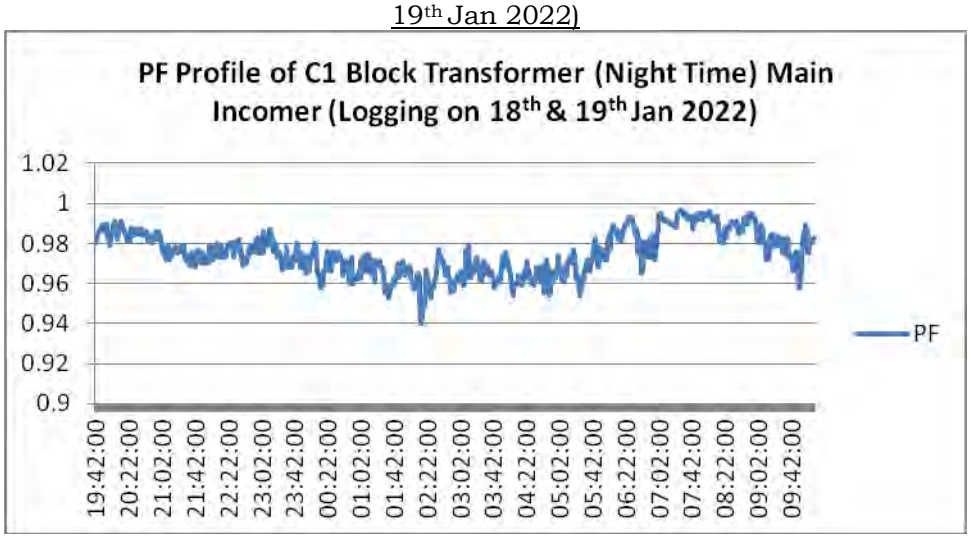
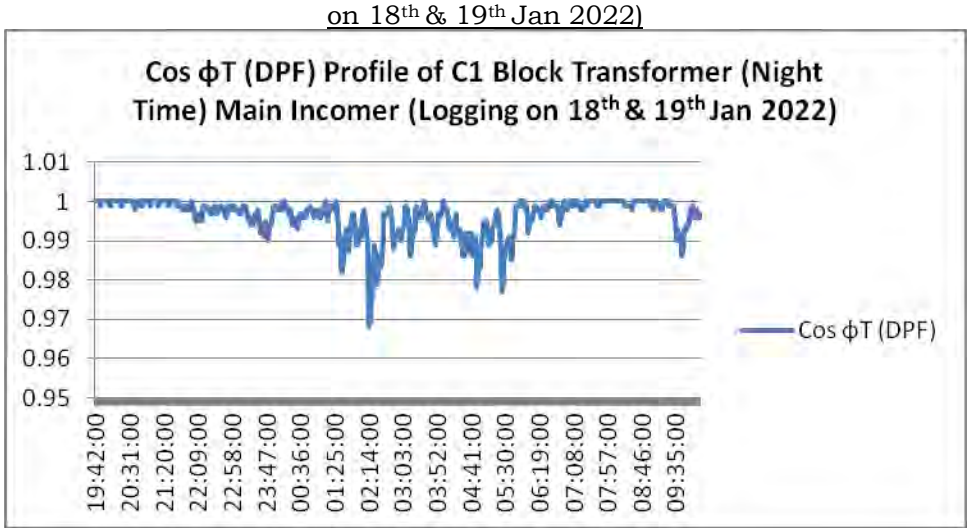


Figure 63 Cos φT (DPF) Profile of C1 Block Transformer (Night Time) Main Incomer (Logging on 18th & 19th Jan 2022)



Location - Samundra Township CSS TR for C35			
Date -19/01/2022		Time -11:20:00 AM to 01:31:00 PM	
Parameters	**Minimum**	**Average**	**Maximum**
Voltage (V)			
U12 rms	415.8	420.2	425.8
U23 rms	412.5	416.7	421.9
U31 rms	412.9	417.2	423
Voltage (V)			
V1 rms	238.7	241.2	244.5
V2 rms	240.4	242.9	246.1
V3 rms	237.3	239.8	243
Current			
L1 (A)	14.5	47.2	96.7
Active Power			
Total (KW)	3.1	11	22.5
Reactive Power			
Total (KVAR)	-0.5	1.4	4.9
Apparent Power			
Total (KVA)	3.5	11.3	23
Power Factor			
Total	0.9	1	1
Harmonics			

Voltage THD %	1.1	1.6	2
Current THD%	6.3	18	51.1

Remarks: Average % Ampere Harmonics is 18 %.

Figure 64 Voltage Profile of CSS Transformer for C35 Main Incomer (Logging on 19th Jan 2022)

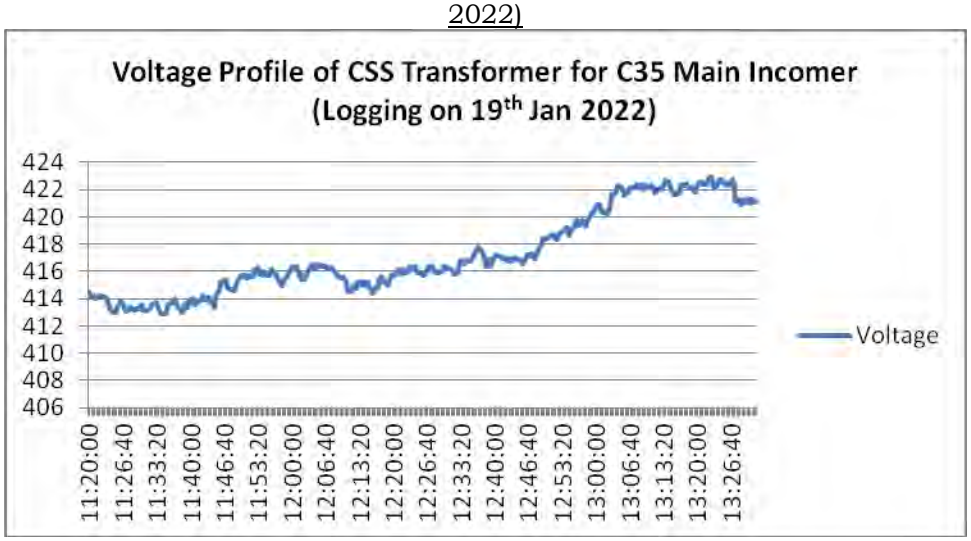


Figure 65 %Voltage Harmonics Profile of CSS Transformer for C35 Main Incomer (Logging on 19th Jan 2022)

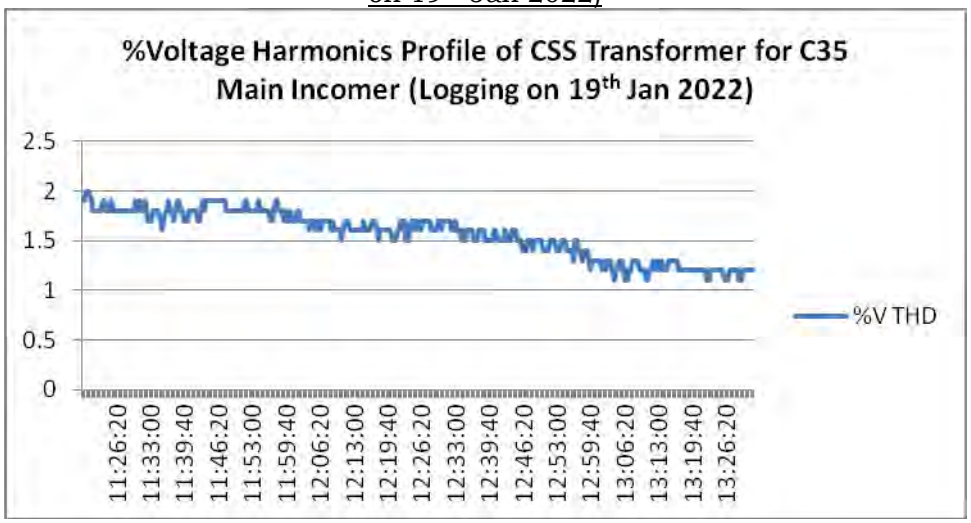


Figure 66 Ampere Profile of CSS Transformer for C35 Main Incomer (Logging on 19th Jan 2022)

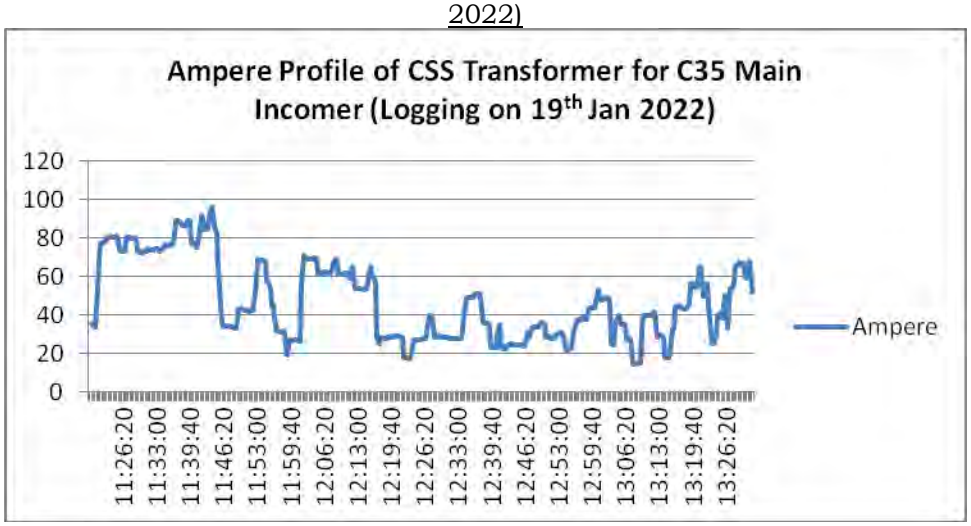


Figure 67 %Ampere Harmonics Profile of CSS Transformer for C35 Main Incomer (Logging on 19th Jan 2022)

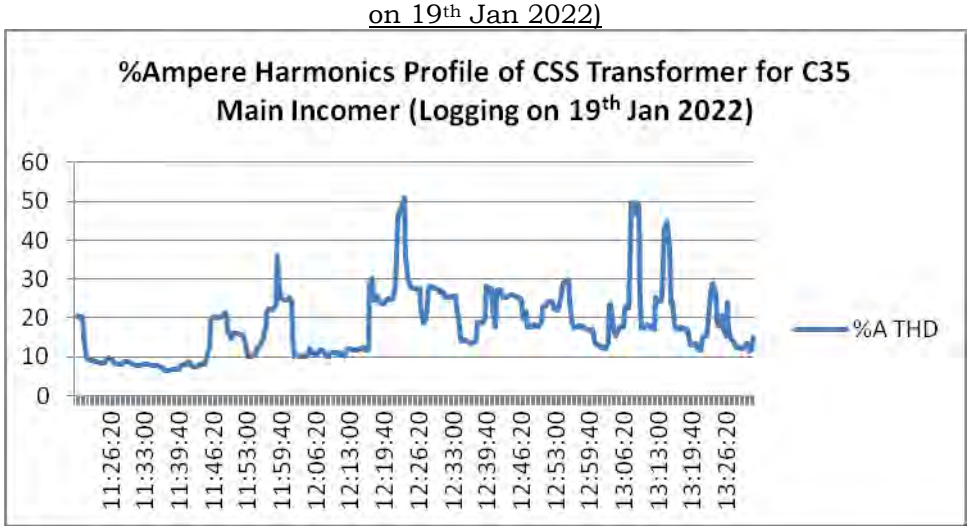


Figure 68 KW Profile of CSS Transformer for C35 Main Incomer (Logging on 19th Jan 2022)

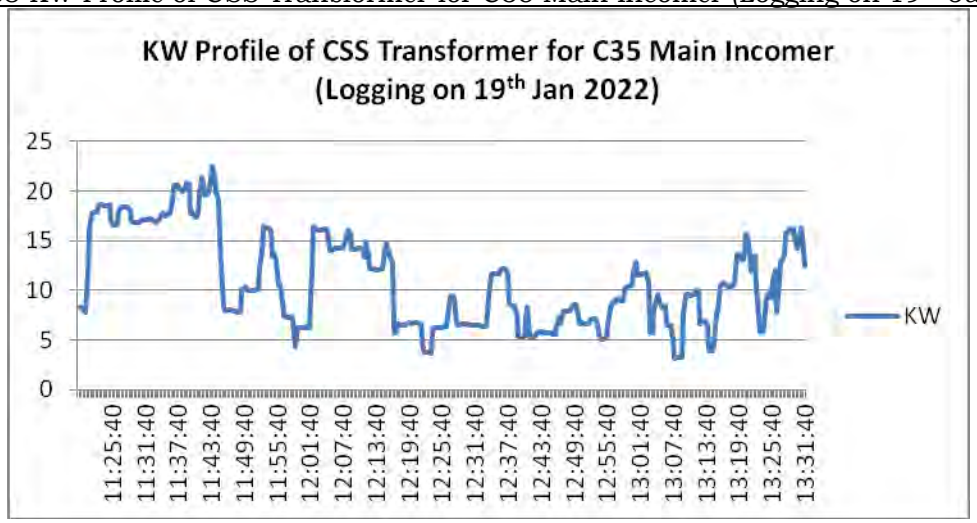


Figure 69 PF Profile of CSS Transformer for C35 Main Incomer (Logging on 19th Jan 2022)

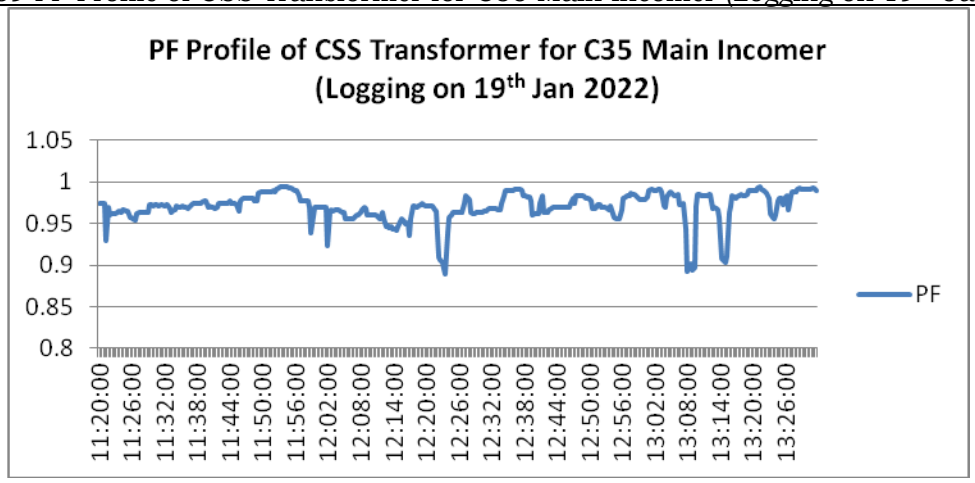
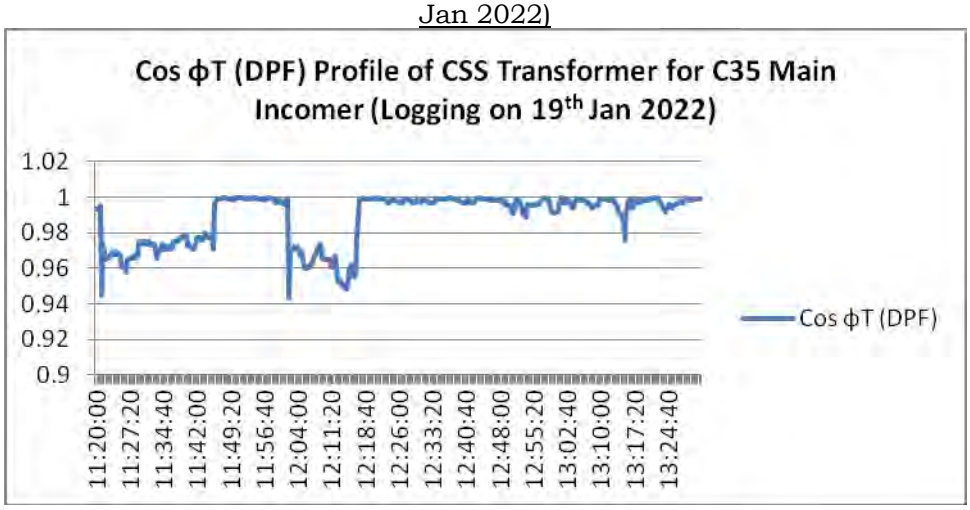


Figure 70 Cos φT (DPF) Profile of CSS Transformer for C35 Main Incomer (Logging on 19th Jan 2022)



Location - Samundra Township TR for STP			
Date -20/01/2022		Time -11:03:00 AM to 01:05:00 PM	
Parameters	**Minimum**	**Average**	**Maximum**
Voltage (V)			
U12 rms	415.8	418.5	425.6
U23 rms	417.4	420.3	427.5
U31 rms	415.5	418.3	425.6
Voltage (V)			
V1 rms	239.5	241.2	245.4
V2 rms	240	241.8	246
V3 rms	241.4	242.7	246.8
Current			
L1 (A)	54.3	87.6	123.8

Location - Samundra Township TR for STP			
L2 (A)	71.4	100.1	128.6
L3 (A)	55.4	90.2	127.3
Active Power			
Total (KW)	29.8	52.7	75
Reactive Power			
Total (KVAR)	31.4	39.6	48.9
Apparent Power			
Total (KVA)	44.2	67.2	90.9
Voltage Unbalance			
Total Uunb (IEEE 112)	0.3	0.3	0.4
Ampere Unbalance			
Total Aunb (IEEE 112)	1.4	9.2	18.5
Power Factor			
Total	0.7	0.8	0.8
Harmonics			
Voltage THD %	1.3	2.2	3
Current THD%	1.3	10.6	20.3

Remarks: Average % Ampere Harmonics is 10.6 %.

Figure 71 Voltage Profile of Samudra Township STP Transformer (315 KVA) Main Incomer (Logging on 20th Jan 2022)

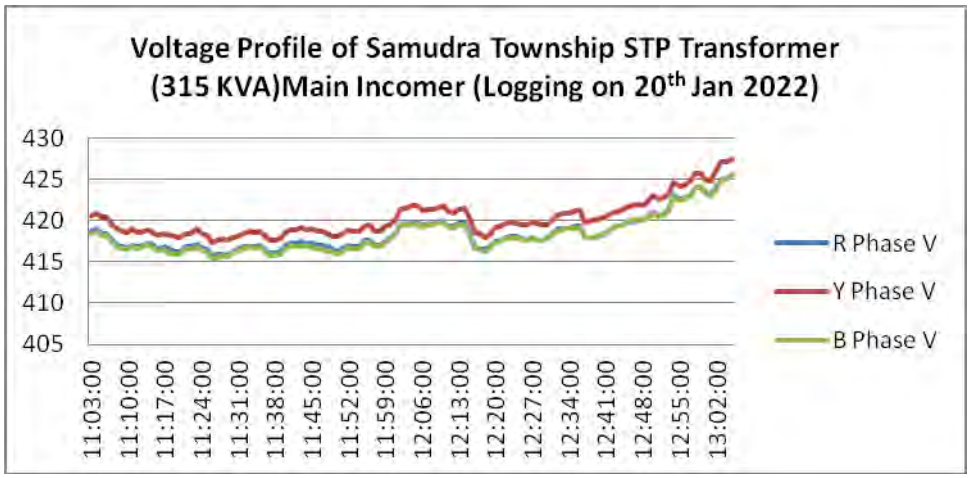


Figure 72 %Voltage Harmonics Profile of Samudra Township STP Transformer (315 KVA) Main Incomer (Logging on 20th Jan 2022)

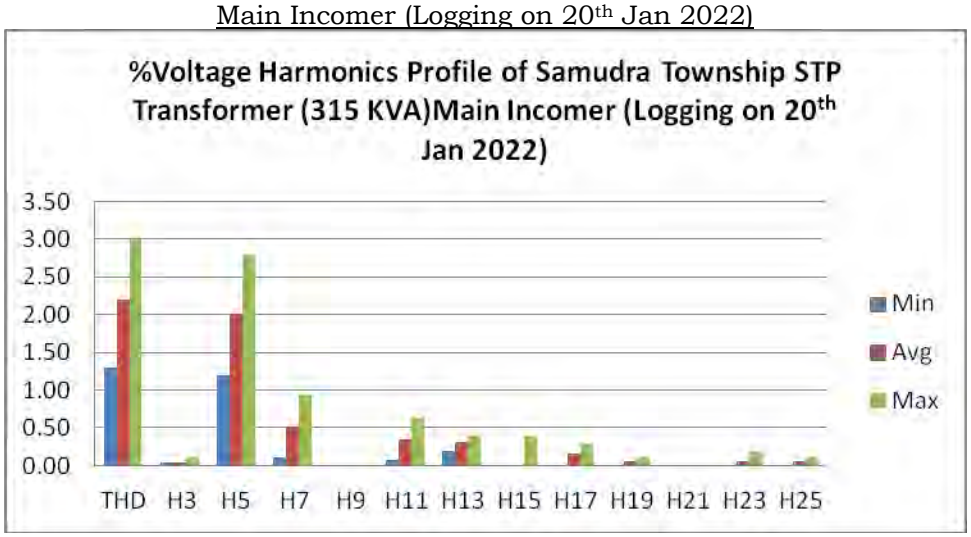


Figure 73 Ampere Profile of Samudra Township STP Transformer (315 KVA) Main Incomer (Logging on 20th Jan 2022)

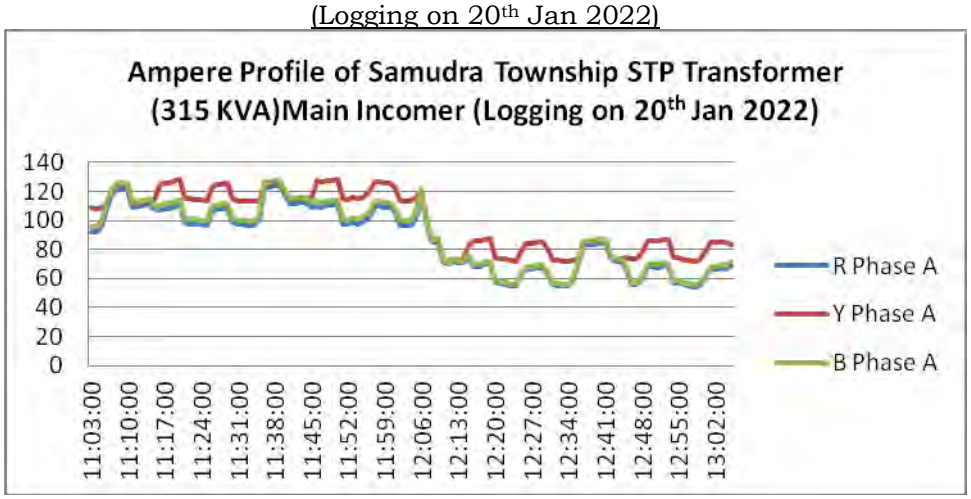


Figure 74 %Ampere Harmonics Profile of Samudra Township STP Transformer (315 KVA) Main Incomer (Logging on 20th Jan 2022)

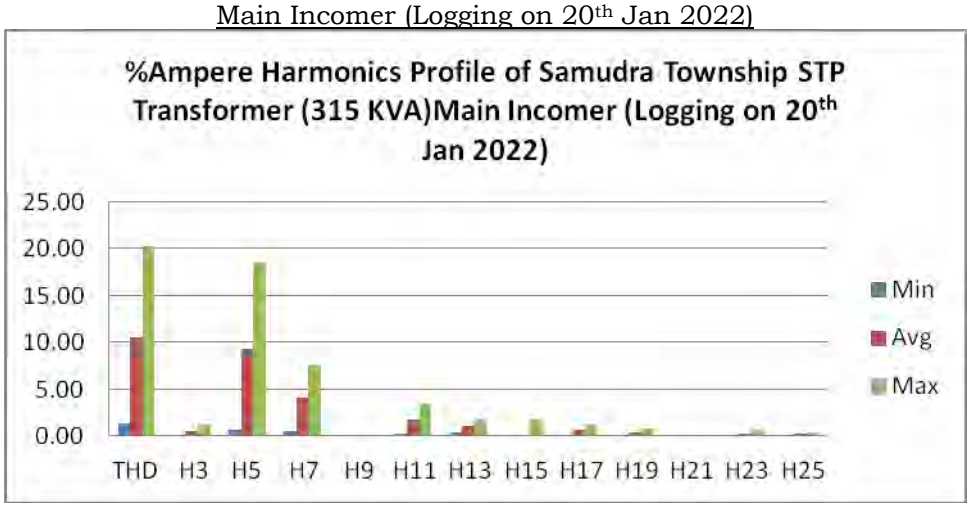


Figure 75 KW Profile of Samudra Township STP Transformer (315 KVA) Main Incomer (Logging on 20th Jan 2022)

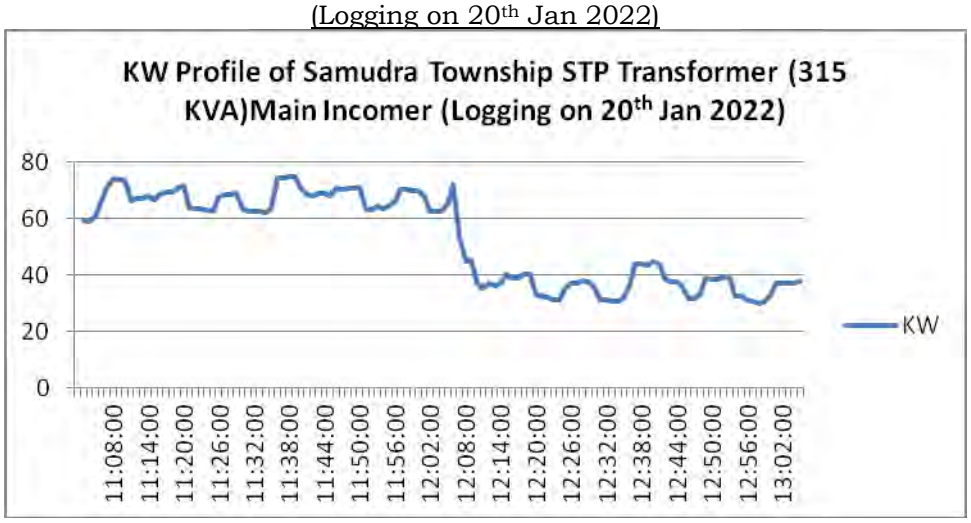


Figure 76 PF Profile of Samudra Township STP Transformer (315 KVA) Main Incomer (Logging on 20th Jan 2022)

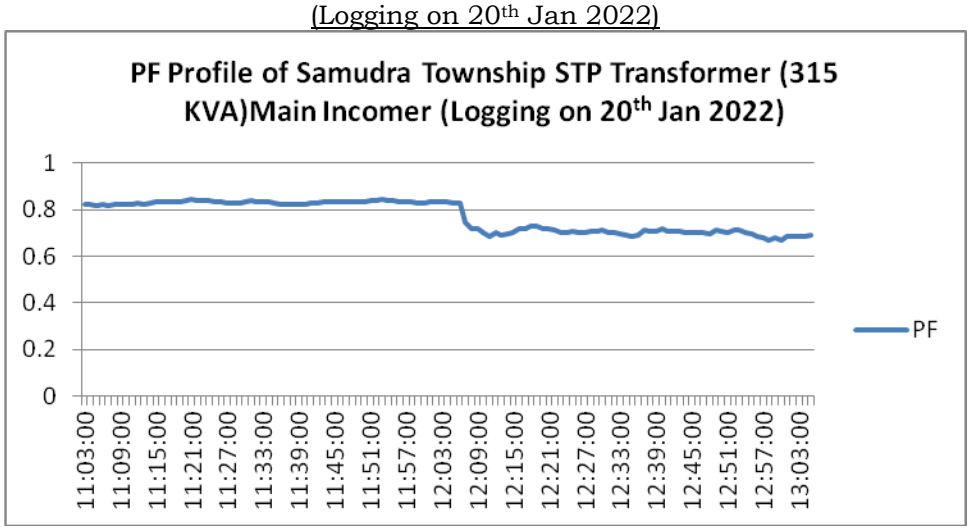
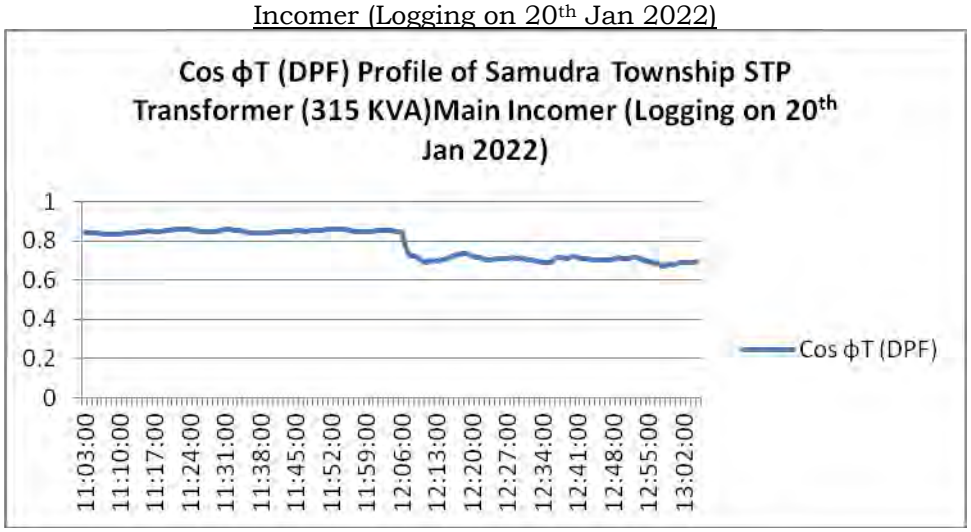


Figure 77 Cos φT (DPF) Profile of Samudra Township STP Transformer (315 KVA) Main Incomer (Logging on 20th Jan 2022)



3.2 Capacitor Banks Health Check

- No any HT & LT Capacitor installed at Samudra Township.

3.3 Pumping System

Installation and Operational Details

- Location pump House having 3 nos. of Raw water & Pressure boosting pump are installed in which 2 nos. of pump are running Continuously working. But during Audit period pump is not working conditions.
- The Pressure boosting system is Available but Presently not working, Water from the Pump House is used inside the port, following are the details.

Installation and Operational Details

Pump House

- There are more than 20 pumps of different capacities are installed at Samudra Township out of which 14 pumps that are above 1.5 kW motor rating have been included in the study.
- Most of the pumps are installed in Sewage treatment plant (STP) where water is collected from township's sewage system and is re circulated after filtration. Installation, operation and performance details of the pumps studied are described in below table.
- 700 to 800 KL of STP is filtered and re circulated into township for Gardening.
- Total installed filtration capacity is 2 MLD against the demand of 1 MLD.
- Pumps discharge flow has been measured using ultra sonic flow metering device. Power has been measured at motor feeder. Discharge and suction head has been noted from online gauges. Pump efficiency is estimated in table below.

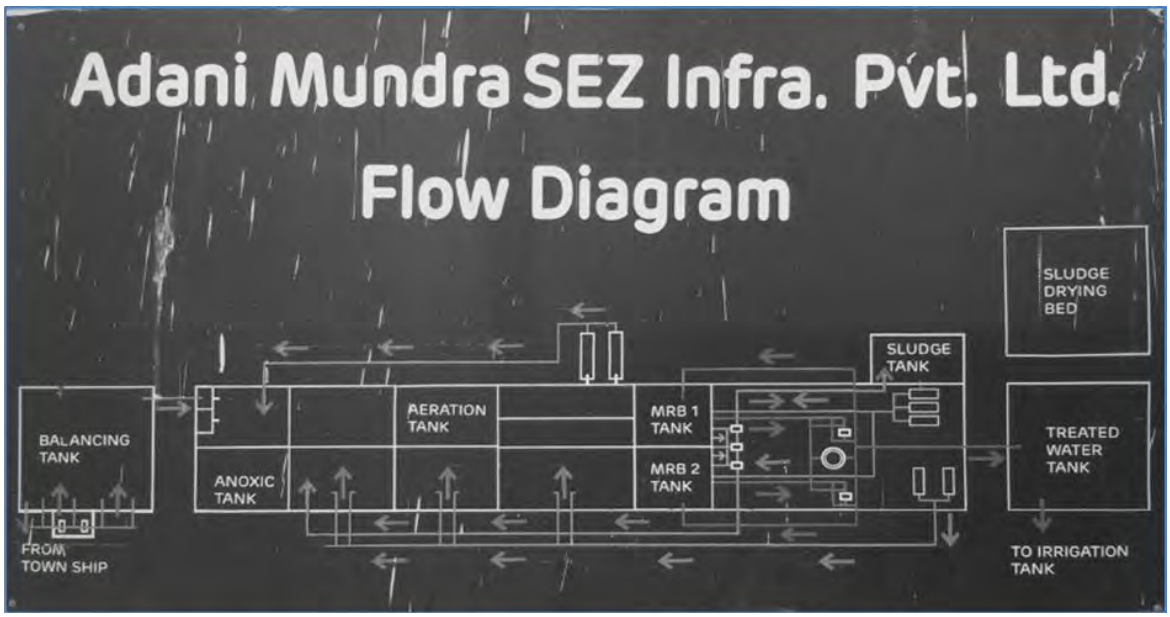


Table 8 : Pump Performance Assessment for Township and STP Pump

Particulars	Unit	Equalization tank Raw Water Transfer Pump	Process Pump-1	Process Pump-2	Horticulture Pump	RAS Pump-2
Design Data						
Head, m	m		15	15	30	18.5
Flow, m^3/hr	m^3/h		45	45	111.6	90
Speed, rpm	rpm					
Motor Rating, kW	kW	5.5	3	3		7.5
Voltage, kV	V	415	415	415	415	415
Site Measurements						
Suction pressure, kg/cm^2g	kg/cm^2g		-0.2	-0.2	0.1	0.2
Discharge pressure, kg/cm^2g	kg/cm^2g		0.5	0.5	3.5	0.4
Volume flow, m^3/h	m^3/h	85	32	32	98	86
Power input to motor, kW	kW	4	2.3	2.7	12.69	6.18
Motor efficiency, %	%	92%	83%	83%	88%	88%
Mechanical efficiency of coupling	%	100%	100%	100%	100%	100%
Calculations for estimation of pump efficiency						
Specific gravity at suction conditions		0.993	0.993	0.993	0.993	0.993
Specific gravity at discharge conditions		0.993	0.993	0.993	0.993	0.993
Discharge head, m	m	2.50	5.05	5.05	35.32	4.04
Suction head, m	m	0.00	-2.02	-2.02	1.01	2.02
Differential head, m	m	2.50	7.06	7.06	34.31	2.02
Total Volume flow , m3/hr	m^3/h	85	32	32	98	86
Hydraulic Power developed by pump, kW	kW	0.58	0.61	0.61	9.10	0.47
Pump shaft power, kW	kW	3.68	1.90	2.23	11.17	5.44
Overall pump set efficiency, %	%	14.38%	26.59%	22.65%	71.69%	7.60%
Pump efficiency, %	%	15.63%	32.23%	27.46%	81.47%	8.64%

Particulars	Unit	Equalization tank Raw Water Transfer Pump	Process Pump-1	Process Pump-2	Horticulture Pump	RAS Pump-2
Remark		Balancing tank to aeration tank (1W+1S/B)	MRB tank to treated water tank			(1W+2S/B)

Table 9 : Pump Performance Assessment for Samudra colony

Particulars	Unit	Main Irrigation Tank Submersible Pump	Sprinkler Pump (250kl Tank)	Adani Hospital & Mitap Submersible Pump	Hostel Area Sprinkler Horse Pipe Water Supply	Club House Tank Submersible Pump	Club House Tank Pump for Port and Garden
Design Data							
Head, m	m						
Flow, m^3/hr	m^3/h						
Speed, rpm	rpm						
Motor Rating, kW	kW	11			5.5	11	3.7
Voltage, KV	V	415	415	415	415	415	415
Site Measurements							
Suction pressure, kg/cm^2g	kg/cm^2g	-0.3	-0.3				
Discharge pressure, kg/cm^2g	kg/cm^2g	2.4	4.3				
Volume flow, m^3/h	m^3/h	63	48.5	25.85	11.12	50.76	14
Power input to motor, kW	kW	10.29	10.21	10.21		10.59	4.36

Particulars	Unit	Main Irrigation Tank Submersible Pump	Sprinkler Pump (250kl Tank)	Adani Hospital & Mitap Submersible Pump	Hostel Area Sprinkler Horse Pipe Water Supply	Club House Tank Submersible Pump	Club House Tank Pump for Port and Garden
Motor efficiency, %	%	92%	92%	92%	88%	92%	88%
Mechanical efficiency of coupling	%	100%	100%	100%	100%	100%	100%
Calculations for estimation of pump efficiency							
Specific gravity at suction conditions		0.993	0.993	0.993	0.993	0.993	0.993
Specific gravity at discharge conditions		0.993	0.993	0.993	0.993	0.993	0.993
Discharge head, m	m	24.22	43.39	0.00	0.00	0.00	0.00
Suction head, m	m	-3.03	-3.03	0.00	0.00	0.00	0.00
Differential head, m	m	27.24	46.42	0.00	0.00	0.00	0.00
Total Volume flow, m3/hr	m^3/h	63	48.5	25.85	11.12	50.76	14
Hydraulic Power developed by pump, kW	kW	4.64	6.09	0.00	0.00	0.00	0.00
Pump shaft power, kW	kW	9.47	9.39	9.39	0.00	9.74	3.84
Overall pump set efficiency, %	%	45.14%	59.66 %	0.00%	#DIV/0 !	0.00%	0.00 %
Pump efficiency, %	%	49.06%	64.85 %	0.00%	#DIV/0 !	0.00%	0.00 %

Particulars	Unit	Main Irrigation Tank Submersible Pump	Sprinkler Pump (250kl Tank)	Adani Hospital & Mitap Submersible Pump	Hostel Area Sprinkler Horse Pipe Water Supply	Club House Tank Submersible Pump	Club House Tank Pump for Port and Garden
Remark		Supply-Club House area tank and Sprinkler garden.	If Auto Valve Close 4.5 kg/cm 2 Bypass In tank (250kl Tank).				

❖ **Observation & Saving Potential**

- Main Irrigation Tank Submersible Pump flow found when running in individual is 63 m3/ hr as against rated of 5 & 90 m3/hr.
- The present total head of the Main Irrigation Tank Submersible Pump found 24 meter.
- The present power consumption of the Main Irrigation Tank Submersible Pump is 10.29 kW.
- Present operating efficiency of the Main Irrigation Tank Submersible Pump running is 48.7 %.

3.3.1 Savings Potential at Main Irrigation Tank Submersible Pump

Particulars	Unit	Main Irrigation Tank Submersible Pump
Make		
Rated Flow	m^3/hr	
Rated Head	mts.	
Connected Motor	kW	11
Estimated Operating Flow	m^3/hr	63
Fluid density	kgs/m^3	993
Discharge Pressure	kg/cm^2	2.4
Suction Pressure	kg/cm^2	-0.3
Operating Head	mts.	27.1
Hydraulic Power	kW	4.61

Particulars	Unit	Main Irrigation Tank Submersible Pump
Rated Motor Efficiency	%	92
Measured Pump Input Power	kW	10.29
Corrected Pump Input power	kW	9.5
Pump Efficiency	**%**	**48.7**
Overall Efficiency	**%**	**44.8**
New Proposed Pump Efficiency	%	70%
Similar Flow	m^3/hr	63
Similar head	mts.	27.1
Estimated Power for same flow & better efficiency	kW	7.2
Savings potential with New Energy efficient Pump	**kW**	**3.1**
Operating Hours	Hrs.	4000
Annual Saving	kWh	12514.14
Unit Rate	Rs./kWh	5.2
Annual Monetary Savings	**Rs.**	**65073.51**
Proposed Investment for new Pump	Rs.	60000
Simple Payback	Months	11.06

Table 10 : Performance Assessment for Township pumps

Particulars	Unit	C-12 irrigation tank Pump	Irrigation tank No-5 Pump(25kl Tank)	Samundra Township Temple Back side Pump	Main Gate Tank Pump	pump at customer care office
Design Data						
Head, m	m			34		
Flow, m^3/hr	m^3/h			35.28		
Speed, rpm	rpm					
Motor Rating, Kw	kW	3.7	3.7	5.5	3.7	37.5
Voltage, KV	V	415	415	415	415	415
Site Measurements						
Suction pressure, kg/cm^2g	kg/cm^2g			0.1		0.1

Particulars	Unit	C-12 irrigation tank Pump	Irrigation tank No-5 Pump(25kl Tank)	Samundra Township Temple Back side Pump	Main Gate Tank Pump	pump at customer care office
Discharge pressure, kg/cm²g	kg/cm²g					1.7
Volume flow, m³/h	m³/h	8	10	38	5.4	250
Power input to motor, kW	kW	2.77	3.11	5.29	4.15	36.76
Motor efficiency, %	%	88%	88%	88%	88%	86%
Mechanical efficiency of coupling	%	100%	100%	100%	100%	100%
Calculations for estimation of pump efficiency						
Specific gravity at suction conditions		0.993	0.993	0.993	0.993	0.993
Specific gravity at discharge conditions		0.993	0.993	0.993	0.993	0.993
Discharge head, m	m	-	-	0.00	-	17.15
Suction head, m	m	-	-	1.01	-	1.01
Differential head, m	m	-	-	-1.01	-	16.15
Total Volume flow , m3/hr	m³/h	8	10	38	5.4	250
Hydraulic Power developed by pump, kW	kW	-	-	-0.10	-	10.92
Pump shaft power, kW	kW	2.44	2.74	4.66	3.65	31.61
Overall pump set efficiency, %	%	%	%	-1.96%	%	29.71%
Pump efficiency, %	%	%	%	-2.23%	%	34.55%

Particulars	Unit	C-12 irrigation tank Pump	Irrigation tank No-5 Pump(25kl Tank)	Samundra Township Temple Back side Pump	Main Gate Tank Pump	pump at customer care office
Remark				Water Supply in Tree plant, Temple Cleaning.		Raw sewage water supply from township to STP

3.4 Compressed air Systems

STP Air Compressor

- The 1 nos. of 35 CFM Air Compressors are installed in STP Plant in which 1 nos. are Reciprocating type and 1 nos. are Reciprocating type Compressors, Reciprocating type ELGI 35 CFM Air compressors are used for Areation tank. Following are the details.

Table 11 : STP Air compressor Installation Details

Sr. No.	Description	Unit	Values
1	Make		Elgi
2	Model		TS 10LB
3	Pressure rating	Bar	12
4	Initial Pressure (P1)	Bar	0
5	Discharge Pressure (P2)	Bar	9
6	Rated Capacity	CFM	35.4
7	Motor rating	KW	7.5
8	Air Receiver capacity	m3/min	0.5

- Volumetric capacity test for all available air compressors is undertaken during the test study to assess capacity and volumetric efficiency.

Figure 78 Voltage Profile of Samudra Township STP Air Compressor Main Incomer (Logging on 20th Jan 2022)

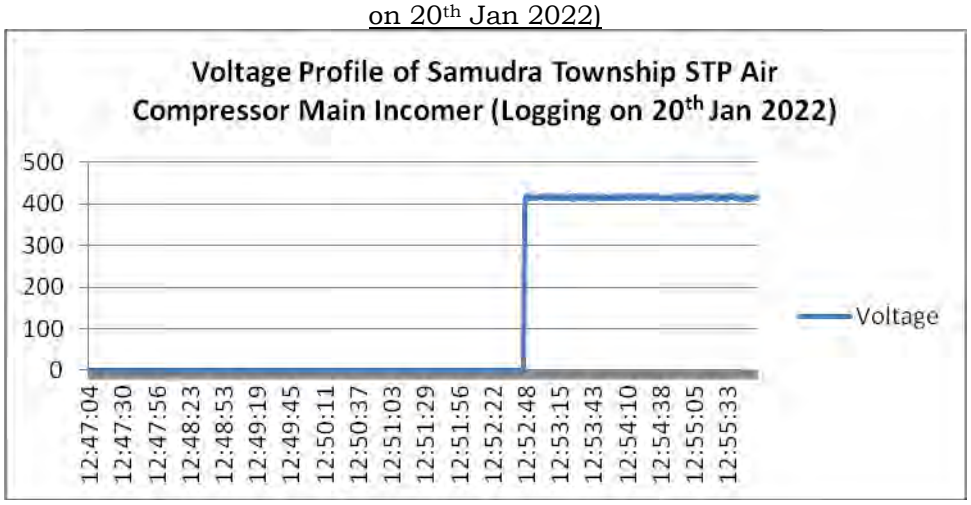


Figure 79 %Voltage Harmonics Profile of Samudra Township STP Air Compressor Main Incomer (Logging on 20th Jan 2022)

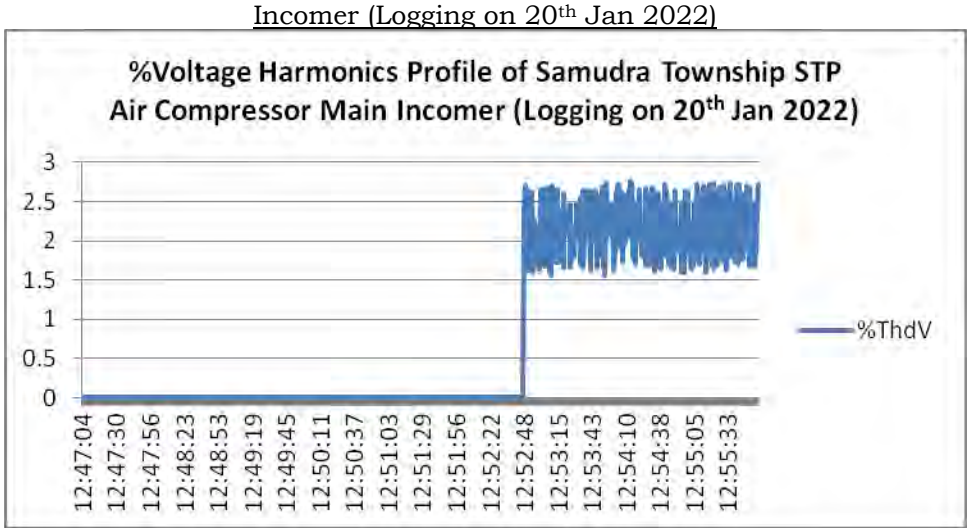


Figure 80 Ampere Profile of Samudra Township STP Air Compressor Main Incomer (Logging on 20th Jan 2022)

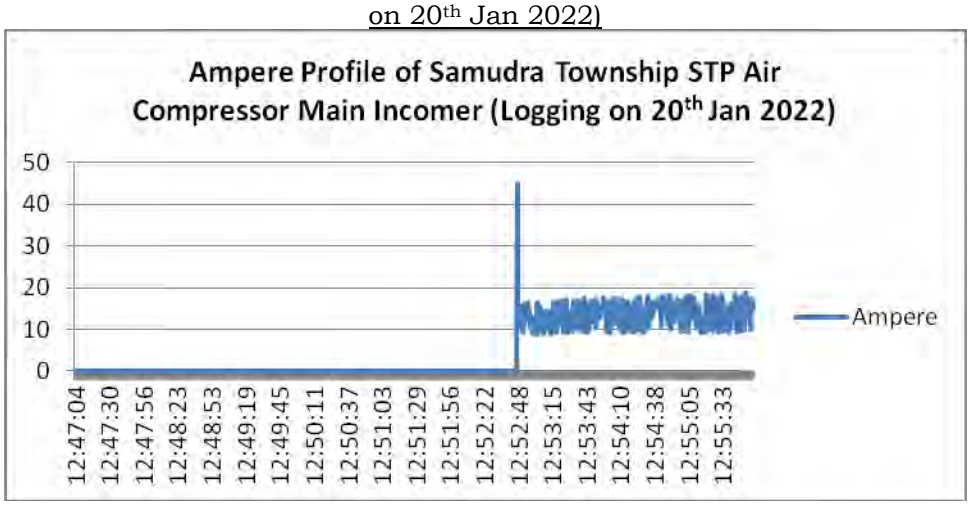


Figure 81 %Ampere Harmonics Profile of Samudra Township STP Air Compressor Main Incomer (Logging on 20th Jan 2022)

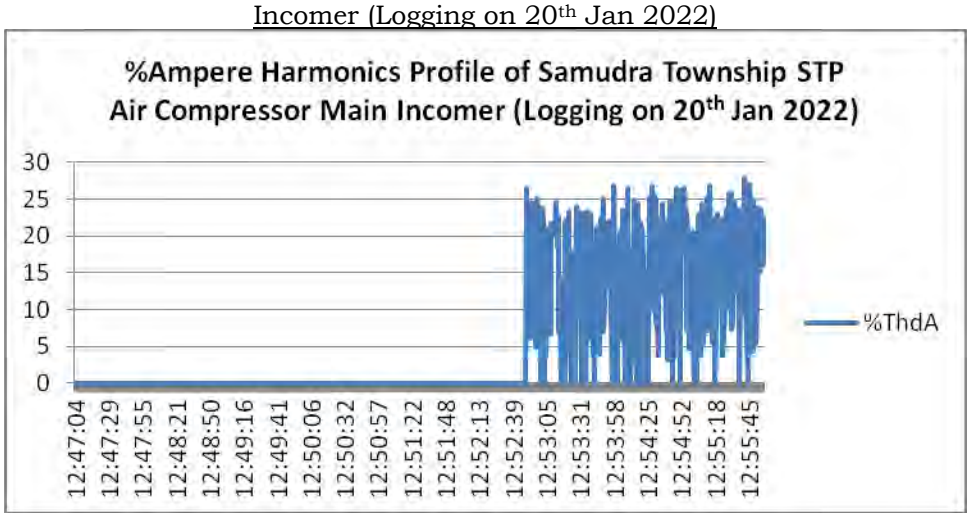


Figure 82 KW Profile of Samudra Township STP Air Compressor Main Incomer (Logging on 20th Jan 2022)

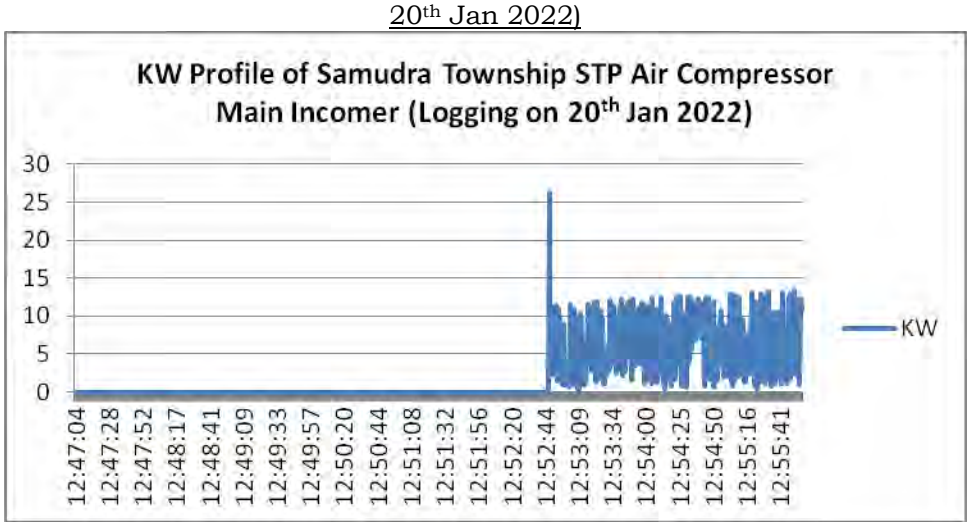


Figure 83 PF Profile of Samudra Township STP Air Compressor Main Incomer (Logging on 20th Jan 2022)

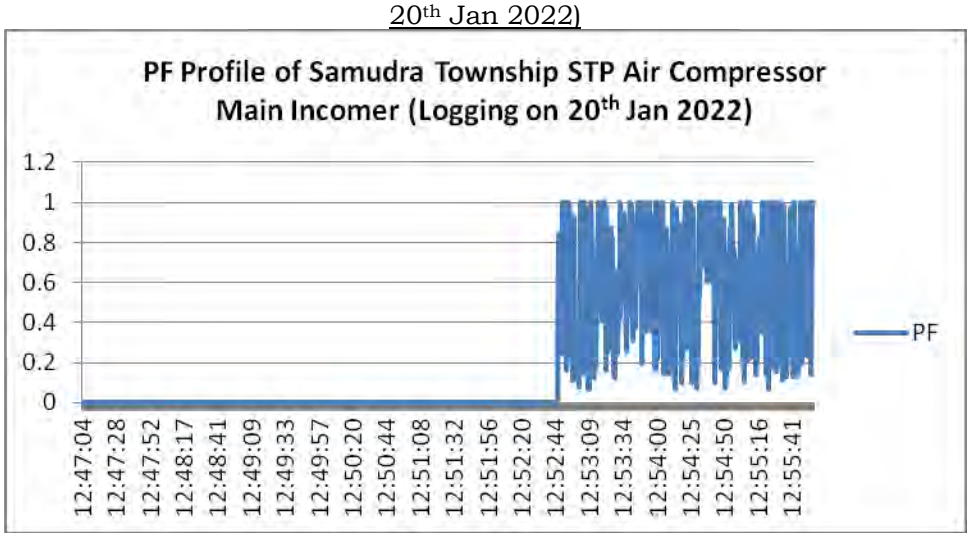
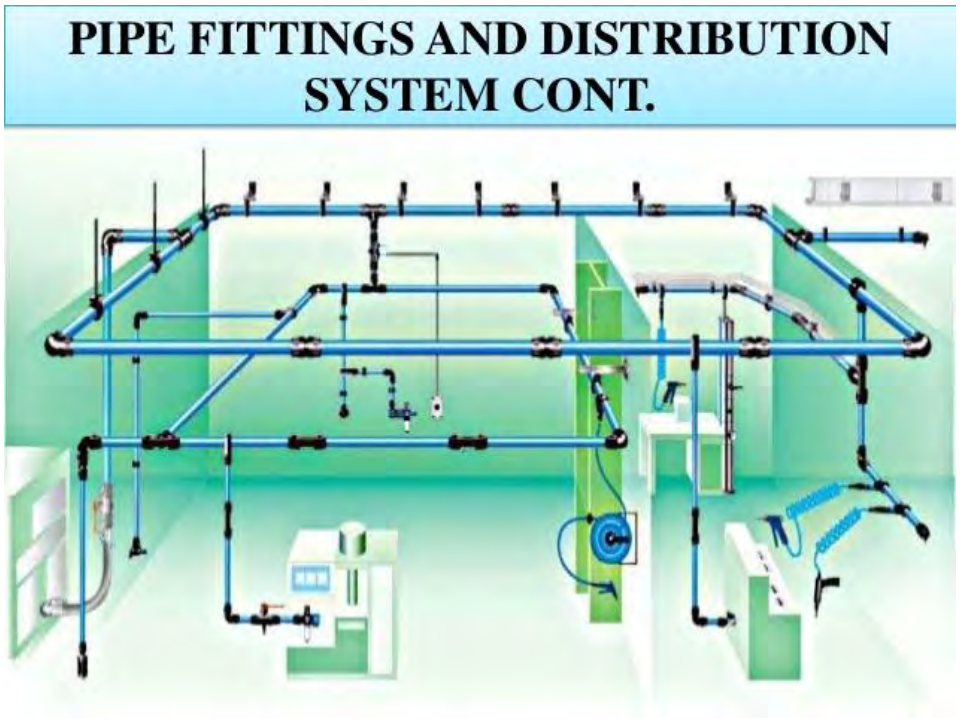


Table 12 : Recommended Pipe Line System to APSEZ Pipe Fittings & Distribution System



- Pipe line distribution system to improve and reduced pressure drop in system. Presently due to pressure drop Air compressor generation pressure is 8 to 7 kg/cm2.
- 2 to 1 kg/cm² Reduction Pressure.

3.4.1 Savings Potential at To Optimized Pressure

- STP Pneumatics valve required Maximum 5 Kg/cm² required.

Air Compressor (Present Load/Unload Pressure: 5/9 Kg/cm²)				
Savings due to reduction of 2 kg/cm² during normal loading conditions.				
Sr. No	Parameter	Unit	Air Compressor	Air Compressor
1	Savings by reduction of 1 kg/cm²	%	8	8
2	Motor Installed capacity	KW	7.5	7.5
3	Observed Power	KW	9	9
4	Remarks		Normal Load	Unload Condition
5	Savings anticipated by reduction of 2 kg/cm²		1.8	0
6	Annual Savings in KWH (Calculation used 180 Days* 12 hrs/day)		3888	0
7	Annual Savings in Rs. (Rate- Rs. 5.28/kWh)		20528.64	0

Annual Savings in KWH	3888
Annual Savings in Rs.	20528.64
Investment	Nil
Payback Period	Immediate

3.4.2 Good House Keeping of Air Compressor House

Monitoring and Arresting Leakages

- The major opportunity to save energy is in the prevention of compressed air leaks in the distribution system. Leaks frequently occur at air receivers, relief valves, pipes and hose joints, shut off valves, quick release couplings, tools & equipment. In most cases, they are due to poor maintenance and sometimes, improper installations etc. If ideally no leakage is there & compressed air is not being used then compressor should remain in the unload condition. But leakages cause artificial load demand on the compressor.
- There will always be some leakages in the plant and the maintenance personnel have to continuously identify leaks jointly with production staff and arrest the same.

Good House Keeping

- Regular draining of water collected in the receiver
- In an ideal system, all cooling and condensing of air should be carried out before the air leaves the receiver. The amount of condensation, which takes place in the lines, depends on the efficiency of moisture extraction before the air leaves the receiver and the temperature in the mains itself.

Installing additional receivers near use points

- To reduce or minimise artificial peak demand, the plant should install additional receiver's near point of use. This will reduce artificial peak demands on the compressor and minimise load – unload frequency. Providing an air receiver near the load end, where there is sudden high demand lasting for a short period, would avoid the need to provide extra air compressor capacity.
- The additional air receiver near use point provides following advantageous
  - dampens pulsations entering the discharge line from the compressor;
  - serves as a reservoir for sudden or unusually heavy demands in excess of compressor capacity;
  - prevents too frequent loading and unloading (short cycling) of the compressor; and
  - separates moisture and oil vapour, allowing the moisture carried over from the after coolers to precipitate.

Cleaning of suction filters

- The suction filters of all compressed air systems should be regularly checked and cleaned. Air compressors are like breathing machines. The cleaner the air the better is the specific energy consumption. Also, the lesser resistance

to suction air flow the better is the compressor performance. The same is being satisfactorily taken up at the plant.

- Regular cleaning of intercoolers and after coolers. Checking temperatures across heat exchangers will assist in maintaining these equipment's and system efficiency.
- Avoid the improper, yet common practice of cracking drains in an effort to insure moisture free performance at a particular point-of-use.
- Sizing of distribution network. The pipe size selected should be such that velocity of compressed air is less than 18 m/sec in the mains. The pipe should be selected a size higher to allow for future expansion provisions. Pipe should have a natural slope and drain points at lowest points to facilitate installation of moisture removal drain traps.
- The air receiver should be generously sized to give a large cooling surface and even out the pulsation in delivered air pressure from air compressor. Simple formula often quoted for air receiver size is to take a value equal to one minute's continuous output of the compressor. However, this should be considered indicative of the minimum size of receiver. Another approximation can be to size the receiver volume to be 5% of the rated hourly free air output.

3.5 Harmonics /Logging study

- Harmonics are one of the most well-known power quality phenomena and are the result of the distortion of sinusoidal signal of the voltage and / or current. Distorted waveforms can be broken down into sum of components at the fundamental frequency and at the frequencies multiple of the fundamental one. Harmonics are signal components with frequencies that are integer multiples of the fundamental operating frequency of the system.
- The distortion of the sinusoidal waveform and the presence of harmonics are originated by the nonlinear characteristics typical of several devices like UPS and other electronic equipment etc. It is common to use general indexes of harmonics distortion such as Total Harmonic Distortion (THD), a parameter that briefly quantifies the harmonic distortion of a signal.
- The presence of harmonics in a network with capacitors causes a current overload on the capacitor itself and results in increase in temperature and reduces the life of capacitors. Further, the problems that may originate from the presence of harmonics are overload in the PF correction capacitor banks, overload of the neutral conductor, additional losses in transformers and in rotating electrical machines, measurement errors in the counters and untimely triggering of safety relays, disturbance and faults in electronic equipment and computers.

❖ **Effect of Harmonics:** The presence of harmonics in a network would result in:

- Current overload on the capacitor and increase in temperature which reduces the life of capacitors.
- Overload in the PF correction capacitor banks.

- Increased resistance of conductors thereby increased losses and thermal failures.
- Additional losses in transformers and in rotating electrical machines.
- Measurement errors in the counters and untimely triggering of safety relays.
- Disturbance and faults in electronic equipment and computers.
- Study of harmonics was carried out for approximately for pick hours at an interval of 1 minutes and the summary of observations are presented below.

Table 13 : Harmonics study summary

Sr No.	Area/ Location	%Voltage Harmonics			%Ampere Harmonics			Remarks
		Min	Avg	Max	Min	Avg	Max	
1	11 KV Main Incomer	2.1	7.2	7.9	5.1	10.9	15.8	
2	CSS Transformer for Solar B24	1.2	1.6	1.9	2.1	16.2	66.5	
3	Transformer B15 (1000 KVA)	1.7	2.4	3.6	8.8	15.4	22.3	
4	Transformer B67 (1000 KVA)	1.7	2.3	3	18.5	32.6	51.7	
5	CSS Transformer for A18	1.6	2.3	3.1	1.6	8.2	17.2	
6	CSS Transformer for Solar A32	1.3	2.3	2.9	8.5	18.8	63.1	
7	CSS Transformer for Solar B24	1.2	1.6	1.9	2.1	16.2	66.5	
8	Transformer for C1 Block	1.1	1.4	2.1	5.2	18.4	36.4	
9	CSS TR for C35	1.1	1.6	2	6.3	18	51.1	
10	Transformer for STP (315kva)	1.3	2.2	3	1.3	10.6	20.3	

Note:

- Voltage harmonics (% total harmonic distortion) recorded at the transformer side is within the limits specified by ANSI Standard IEEE 519 - 1992 which is 3% of Voltage Harmonics and 5% whereas current harmonics. It is suggested to carry out a detailed harmonics study over a period of time such that THD is maintained within safe limits. A typical study would record **3rd, 5th, and 7th and higher currents Harmonics** to detect the source and suggest suitable **Active or Passive filters** to suppress it.

- Following charts shows current & voltage harmonics present in the system at the Crain.

3.6 Air Blowers

3.6.1 Installation & Performance Details

- Air blowers are installed at STP for water aeration. Installation and operating details are as mentioned in below table:

Table 14 : Blower Performance Evaluation

Sr. No.	Particulars	Unit	STP Samundra town ship				
1	Make/Model		Everest / twin lobe	Everest/ twin lobe	Everest / twin lobe	Everest / twin lobe	Everest / twin lobe
2			MBR BLOWER 1	MBR BLOWER 2	MBR BLOWER 3	Equalization Blower	Main Aeration Blower 2
3	Sr. No		EB0902 2034	EB0902 20312	EB0902 2033		PD2103 0416
4	Rated Flow	m3/ hr	400	400	400	324	2200
5	Rated Pressure	kg/cm2	0.4	0.4	0.4	0.6	0.6
6	Suction Filter area	m^2	0.079	0.079	0.079	0.058	0.27
7	Measured Suction air velocity	m/sec	1	0.7	0.9	1.3	1.1
8	Actual Discharge Pressure	kg/cm2	0.4	0.4	0.4	0.4	0.6
9	Operating Flow	m^3/ hr	284.4	199.08	255.96	271	1069
10	Actual Measured Power	KW	7.94	7.19	7.45	5.97	31.3
11	**Operating Efficiency**	**%**	**41**	**32**	**39**	**52**	**58**
12	Application (Used for)		**MBR TANK**	**MBR TANK**	**MBR TANK**	**feeding to Equalization tank**	**feeding to aeration tank**
13	Running Hr.		8 -12 Hours/day, (2W+1SB)			8 -12 Hours/ day, (1W+1S/B)	8 -12 Hours/ day, (1W+1S/B)

Sr. No.	Particulars	Unit	STP Samundra town ship		
14	Observations		Flow Distribution uneven & Suction filters need to clean		Running with 27.81 Hz VFD, Non Uniform air distribution found

The operating efficiency of five Township blowers observed to be low. Blower-1 to 5 is respectively 41 %, 32%, 39%, 52% and 58%.

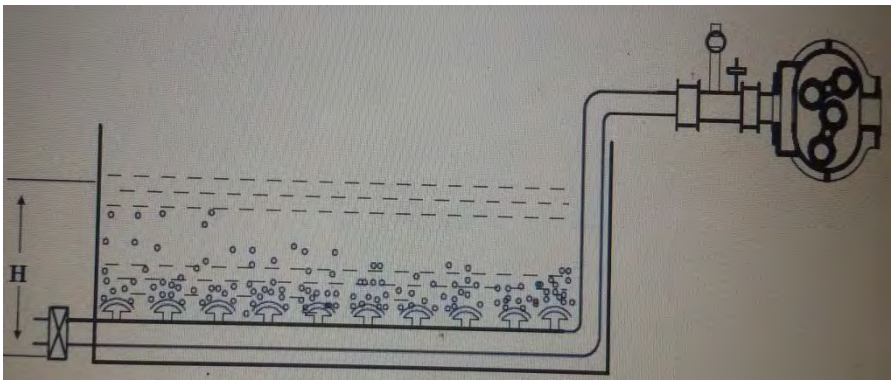
In Existing blower is suggested to clean the filter, maintenance of the motor, check bearing, vibration which would improve the operating efficiency and result in power savings as follows:

Table 15 : Savings potential to improve Efficiency of STP Samundra town ship Blowers

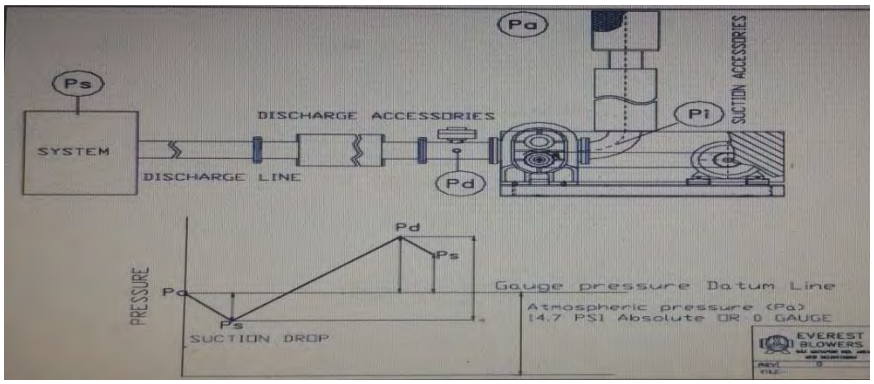
Particulars	Unit	STP Samundra town ship				
Make/Model		Everest/ twin lobe	Everest/ twin lobe	Everest/ twin lobe	Everest/ twin lobe	Everest/ twin lobe
Type of Blower		MBR BLOWER 1	MBR BLOWER 2	MBR BLOWER 3	Equalization Blower	Main Aeration Blower 2
Sr. No		EB09022034	EB09022 0312	EB09022033		PD21030416
Rated Flow	m^3/hr	400	400	400	324	2200
Rated Pressure	kg/cm2	0.4	0.4	0.4	0.6	0.6
Suction Filter area	m^2	0.079	0.079	0.079	0.058	0.27
Measured Suction air velocity	m/sec	1	0.7	0.9	1.3	1.1
Actual Discharge Pressure	kg/cm^2	0.4	0.4	0.4	0.4	0.6
Operating Flow	m^3/hr	284.4	199.08	255.96	271.44	1069.2
Actual Measured Power	KW	7.94	7.19	7.45	5.97	31.3
Operating Efficiency	**%**	**41**	**32**	**39**	**52**	**58**

Particulars	Unit	STP Samundra town ship				
Savings potential after filter cleaning (10%)	**kW**	**0.794**	**0.719**	**0.745**	**0.597**	**3.13**
Operating Hours	Hrs.	3600	3600	3600	3600	3600
Annual Saving	kWh	2858.4	2588.4	2682	2149.2	11268
Unit Rate	Rs./kWh	5.2	5.2	5.2	5.2	5.2
Annual Monetary Savings	**Rs.**	**14864**	**13460**	**13946**	**11176**	**58594**
Proposed Investment for new Pump	Rs.	6000	6000	6000	6000	6000
Simple Payback	Months	4.8	5.3	5.2	6.4	1.2
Application (Used for)		**MBR TANK**	**MBR TANK**	**MBR TANK**	**feeding to Equalization tank**	**feeding to aeration tank**
Running Hr.		8 -12 Hrs/day, (2W+1SB)			8 -12 Hrs/day, (1W+1S/B)	8 -12 Hrs/day, (1W+1S/B)
Observations		Flow Distribution uneven & Suction filters need to clean				Running with 27.81 Hz VFD, Non Uniform air distribution found

Total. Annual Saving (five blower)	kWh	21546
Total. Annual Monetary Savings	**Lakh Rs.**	**1.12**
Total. Proposed Investment for new Pump	Rs.	0.30
Simple Payback	Months	3.2



There is no compression or change in volume within the machine but the blower works under system back pressure conditions. Let us consider a case when the discharge of a blower is connected to the bottom of a tank, having water to a depth of H mm the air discharged accumulates in the discharge line until sufficient pressure is built (slightly over H mm of WG) when it starts to escape out. The system resistance or the static load on the blower is thus H mm WG the power consumed by the blower depends upon the flow rate and the total pressure head on the blower.



The total pressure across the blower is taken as the pressure across the inlet and the discharge port of the blower the pressure drop through inlet accessories and discharge accessories are a part of system drop the figure above indicates Pa as the ambient pressure. Ps is the pressure at the suction pressure Pd is the pressure at the discharge port of the blower and Ps is the actual system back pressure.

As seen from the curve the total work done by the blower is to raise the pressure of inlet volume form Ps to Pd ideally the blower is capable of resisting high pressures but the mechanical limitations increased pressure head to about 7000mm WG for air cooled blowers and 10000mm WG for water cooled blower in single stage operation

It is therefore important to insure that the drop between Pa and Ps and Pd and Ps should be as low as possible. This can be achieved by using adequate size piping and large radius bends wherever possible.

The blowers are generally selected for the maximum system pressure, which they may encounter during operation and the prime mover is selected accordingly when in operation the blower offers a considerable power saving since the power consumed by it depends upon the actual working pressure under which it operates and not the rated pressure.

Observations:

- Non-uniform air distribution in the tanks is observed for all air blowers.

- Main blower 1 and 2 has VFD installed at the motor. The VFD is operated at 27.5 Hz set frequency.
- Main blower 1 Suction Air velocity observed low with low efficiency 28%, Hence it is recommended for Overhauling as well as Discharge cleaning at the bottom of tank.

3.7 Air Conditioner's

3.7.1 Installation, operation and performance details of AC conditioners

There are 1659 nos. of air conditioners out which 4 units with high running hours are assessed for energy efficiency performance. Installation details, operating performance and energy performance of these air conditioner units are mentioned in below table.

Different numbers of AC connection are given according to the type of residential scheme. It is observed that all most of all AC were BEE 2 star label.

Block Type	No. of Flats	Qty. of AC	Total TR
1 BHK	316	316	474
2 BHK	660	660	990
3 BHK	192	384	576
Bachelor	294	294	441
Offices		5	15
Total	1462	1659	2496

Table 16 : AC'S Performance assessment

Description	Unit	1	2	3
		Indoor Game Gym	Indoor Game Gym	Customer Care Office
				Spilt
Rated Capacity				
Capacity	TR	3	3	1.5
Room Set Temp.	^{o}C	21	24	22
Room Dimension	Ft^2	350	350	150
Return air				
Return air DBT	^{o}C	29	28	29
Return air WBT	^{o}C	27	26.5	27
Return air RH	%	85.74	89	85.74
Return air enthalpy	kJ/kg/^{o}C	84.91	82.68	84.91
Return air density	kg/m^3	1.17	1.17	1.17
Supply air				
Supply air DBT	^{o}C	22.5	21.0	22.8

Description	Unit	1	2	3
Supply air WBT	^{O}C	19.0	16.0	19.3
Supply air RH	%	72.2	60.0	72.5
Supply air enthalpy	kJ/kg/^{O}C	53.95	44.71	54.01
Δ Enthalpy	kJ/kg/^{O}C	30.96	37.97	30.90
Air velocity	m/s	2.6	1.9	0.8
Area	m^2	0.10	0.10	0.20
Actual air flow	m^3/s	0.26	0.19	0.16
	m^3/hr	921	673	576
	kg/hr	1076	789	673
	CFM	542	396	339
Input motor power	kW	4.60	5.20	1.50
Heat load	TR	2.6	2.4	1.6
KW/TR		1.75	2.19	0.91
Remarks				Outdoor need to Cleaning, Printer inside the room

Table 17 : Savings potential to improve Efficiency of Samundra town ship AC's

Particulars		for 1.5 ton
EER	2 star	5 star heavy duty
	2.9	3.6
kWh	1.7	0.75
TR Reduction	0.95	
Nos of AC	250	
Working Hr./Annum	2500	
Unit rate Rs.	5.2	

Particulars	for 1.5 ton
Saving in kWh	**593750**
Saving in Rs./Annum	3087500
Investment in Rs.	10500000
Payback period in month	40.8

Check your filters

Check the air filter once per month and replace it as needed. This is especially important during the summer when dust and allergens circulate. If the filter becomes clogged, your system will have to work harder to supply the same amount of cool air.

Replacing filters is one of the easiest and most effective methods of conserving energy and saving money on your HVAC usage. And much like changing the oil in your car, it's a critical step in maintaining your system's long-term health.

Keep your A/C in the shade

Air conditioners with proper shading can run more efficiently. Air in a shaded space is cooler than the surrounding air, meaning the A/C will have an easier time cooling the air.

Install window film to save energy

A great home improvement idea is to install office window film or tint to the insides of your windows. Not only can it help keep your house cooler in the summer, but also warmer in the winter.

3.8 Lighting Survey

- Lux meter is used in order to measure the illuminance at various plant sections. Plant has implemented several energy saving projects in lighting systems. Plant has installed LED lighting system at most locations and Port areas.
- Following measurements were recorded. Illuminance level at the Street light is satisfactory.
- Different variety of lighting schemes have been installed in Samudra Township. Brief description on total lighting is described in below table. Samudra Township has installed geographical timers in streetlight which automatically switch lights as per light conditions. 11 hrs in a day for annual average working hours is taken for calculations.

Table 18 : Installation Load Lighting

Sr. No.	Description	Connected Load in kW	Luminary	Totals Qty	Total Load in kW
1	Sports Courts lighting	0.065	LED	24	1.56
2	Street Lights SON	0.065	LED	122	7.93
3	Street Lights SON	0.065	LED	110	7.15
4	Common Area Passage	0.018	LED	912	16.42
5	Parking Lights & Garden	0.02	LED	160	3.20
6	Parking Lights	0.02	LED	200	4.00
Total Connected Load in kW					**40.26**

Lux measurement and observation of street lighting

- Streetlights and parking lights at Samudra Township were anonymous during the time of audit. Energy audit team has marked tags on the light poles for the reference.

- Explanation of the marked tags is explained in the figure below. Some restricted and non-permissible areas have not been included in the part of lighting study.
- 9 point method was adopted for measuring pole to pole lighting intensity. Below Figure depicts the methodology. Two equations are primarily used for pole to pole and single pole respectively. They are:
  1. Pole to Pole measurement

$$Average\ Lux = \frac{(A_1 + A_2 + B_1 + B_2)}{16} + \frac{(C_1 + C_2 + C_3 + C_4)}{8} + \frac{D_4}{4}$$

  2. Single Pole measurement

$$Average\ Lux = \frac{A_1 + A_2 + B_1 + B_2 + C_1 + C_2 + C_3 + C_4 + D_4}{9}$$

- Parking lights have relatively less span compared to streetlights and so lux is measured at 6 points from pole to pole.

Figure 84 Nine point method for streetlight measurement

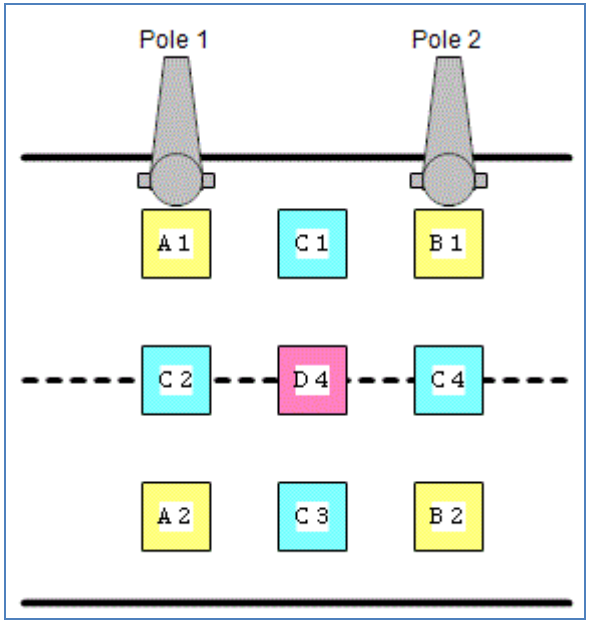


Table 19 : Summary of Lux measurements lighting Fixture Install in Township (APSEZ PLANT)

Area	Install Light	L1	L2	L3	Remark
Electrical Store Room	LED	58	55	26	
		58	30	32	
Solar Panel Side	LED	23	57	75	
		14	14	35	
B-13 & 14 Between Pole Parking	LED	1	1	1	Fixture Reflector Week & Arms Setting not Properly Installed.
		1	1	1	
Block No-B/13	LED	14	8	4	Tree Shadow.
		12	8	7	
Block No-B/14	LED	14	6	10	
		10	5	9	
STPH-6 Street Light	LED	6	23	4	
		4	10	2	
STPH-7 Street Light	LED	4	21	6	
		2	6	4	
Block B-7 to B-12 Parking	LED	8	5	2	
		6	4	2	
		5	3	2	
Block B-1 to B-6 Parking Pole	LED	8	5	3	
		5	4	3	
		7	4	2	

Area	Install Light	L1	L2	L3	Remark
B-19 Outside Block	LED	4	3	2	
		3	2	1	
		4	2	1	
B-24 Outside Block	LED	3	2	1	
		4	2	1	
		4	3	2	
C-01 to C-06 Parking Road	LED	21	15	7	Light Broken due to one side lux higher.
		13	5	2	
		10	7	4	
Block C-11 & C-12 Road Side	LED	1	0	1	Street Light off.
Block C-03 Street Light	LED	1	0	1	Angle Based Bulb Install.
Block C-04 Street Light	LED	3	5	2	C-4 Side Street Light Pole Need to Tree Branches Cut Tree.
C-11 & C-12 Street Light	LED	22	16	14	
		27	30	14	
		14	9	6	
C-11 & C-12 Parking Light	LED	7	5	3	
		5	4	4	
		5	4	2	
Club House STCH-	LED	13	12	7	

Area	Install Light	L1	L2	L3	Remark
7 & 8		19	23	11	
		18	15	8	
C-29 Block	LED	25	14	13	C-28 & 29 Flood Light Fitting Install on Top side.
Way to Parking Side	LED	21	21	20	1 Fitting off to save energy because during night no any operation in this.
Flood Light Event Garden	LED	20	126	30	
		31	112	34	
A-43 Pole Parking	LED	9	11	6	
		11	8	7	
A-39 Pole Parking	LED	11	10	6	
		8	7	5	
A-45 Parking Pole	LED	12	8	4	
		11	9	4	
H.M Security	LED, HM	100	27	64	
		91	121	88	
		32	60	85	

: - Lux measurement of Shopping Centers Street light, Temple, Block, and Playground, etc.

Sr. No.	Location	Pole tag	Height (m)	Span (m)	Luminary	Average Lux	A1	A2	B1	B2	C1	C2	C3	C4	D4	Remarks
1	Near Vodafone Tower Street Light Pole	S.L	9	24	LED	14	12	11	12	6	32	15	8	13	13	Tree branches obstacle create
2	2nd Pole Customer Care B-19 Road	S.L	9	24	LED	14	27	8	19	8	18	16	7	10	13	Need to cut Tree Branches
3	Customer Care Opposite Side b-19 Road Area	S.L	9	24	LED	20	24	31	16	23	23	21	5	16	5	Need to cut Tree Branches
4	STP R-2 Outside Road	S.L	9	24	LED	22	17	23	19	13	23	24	22	22	27	sufficient
5	Service Road Shopping Centre Complex Line	S.L 28-29	9	24	LED Double arm	22	48	15	31	8	21	40	7	12	15	sufficient
6	Service Road STM-30	S.L 29-30	9	24	LED Double arm	15	34	10	31	8	5	17	6	12	11	sufficient
7	Service Road Shopping Centre	S.L 13-14	9	24	LED	11	24	10	17	8	4	6	14	6	4	sufficient

Sr. No.	Location	Pole tag	Height (m)	Span (m)	Luminary	Average Lux	A1	A2	B1	B2	C1	C2	C3	C4	D4	Remarks
	Complex Line															
8	Service Road Shopping Centre Complex Line	S.L 15-14	9	24	LED	13	16	4	13	9	25	9	7	12	14	sufficient
9	Road and Parking Light B-13 to B-18	P.L	3	12	LED	7	14	2	13	3	7	5	6	2	4	Insufficient
10	B-16 Block	P.L	3	12	LED 18w conical shape	7	13	4	10	2	7	5	7	7	8	Light Yellow & Dusting noted in Fixture Glass.
11	B-14 & B-15 Block	P.L	3		LED-Round Type	4	7	2	7	3	5	3	4	2	2	Compare conical light Round type fitting lux level is low.
12	APMVL Hostel Pole No-3 & 2	S.L	9		LED	25	28	10	25	16	10	21	6	10	9	sufficient
13	STMRR-28 & 29 Street Light	S.L	9		LED	14	24	8	18	12	6	25	4	14	7	sufficient
14	STMRR-12 & 13 Street Light	S.L	9		LED	14	22	12	16	14	8	23	6	16	9	sufficient

Sr. No.	Location	Pole tag	Height (m)	Span (m)	Luminary	Average Lux	A1	A2	B1	B2	C1	C2	C3	C4	D4	Remarks
15	STMRR-26 & 27 Street Light	S.L	9		LED	11	11	8	7	4	18	7	17	5	20	sufficient
16	Block No.A-36 to A-43	P.L	3		LED	12	7	9	6	8	10	10	11	23	21	sufficient
17	Cricket Ground P1 & P2	FL	16		LED	105	125	91	150	98	13	205	128	90	44	Tree branches obstacle create
18	Cricket Ground P3 & P4	FL	16		LED	122	84	208	114	101	20	260	60	185	58	sufficient
19	Club House	TL	4		LED	57	50	37	46	64	61	45	85	41	80	sufficient
20	OPR-17		12		LED	53	16	36	20	40	74	22	88	54	124	sufficient
21	OPR-16		12		LED	28	42	17	35	13	56	31	11	27	20	sufficient
22	OPR-15		12		LED	36	40	55	42	13	52	40	15	27	35	sufficient
23	Event Ground	S.L	9		LED	33	43	15	40	13	75	29	11	31	34	All Lights Not Running Condition During measurements
24	Temple	S.L	6		LED	11	10	5	12	7	28	8	4	10	11	sufficient

:-Lux measurement Block wise

Sr. No.	Location	Pole tag	Height (m)	Span (m)	Luminary	Average Lux	A1	A2	B1	B2	C1	C2	C3	C4	D4	Remarks
1	Entrance Main gate	P3	11.5	20	LED	14.67	21	7	11	40	15	11	6	12	9	
2	Entrance gate	P5	11.5	24	LED	13.56	23	3	17	34	7	8	7	11	12	
3	Entrance gate	P4	11.5	24	LED	15.44	17	9	16	38	1	6	10	25	17	
4	Entrance gate	P6	11.5	24	LED	15.33	22	3	7	39	12	7	11	21	16	
5	Entrance gate	P8	11.5	24	LED	16.67	15	6	13	32	12	10	15	32	15	
6	Entrance gate	P9	11.5	24	LED	17	22	5	11	41	13	11	8	25	17	
7	Main Road	P19	11.5	24	LED	14	13	17	14	41	10	11	13	14	8	
8	Main Road	P20	11.5	24	LED	17	13	7	4	37	11	10	12	23	21	
9	Main Road	P14	11.5	24	LED	15	16	6	8	38	10	6	8	24	17	
10	Block B53-B58	H1	3	14	CFL	2	2	3	4	3	0	2	0	1	0	Insufficient
11	Block B53-B58	H2	3	14	CFL	2	5	3	1	0	2	4				Insufficient
12	Block B53-B58	H3	3	14	CFL	2	7	6	5	3	2	3				Insufficient
13	Block B53-B58	H5	3	14	CFL	2	2	4	2	4	3	2				Insufficient
14	Block B53-B58	H7	3	Single	CFL	3	4	2	3	1	0	4				Insufficient
15	Block B53-B58	H8	3	14	CFL	2	4	3	4	6	3	4				Insufficient
16	Block B53-B58	H9	3	14	CFL	2	4	1	3	4	3	6				Insufficient
17	Block B71-B75	H11	3	12	CFL	2	4	5	4	4	3	4				Insufficient

Sr. No.	Location	Pole tag	Height (m)	Span (m)	Luminary	Average Lux	A1	A2	B1	B2	C1	C2	C3	C4	D4	Remarks
18	Block B71-B75	H13	3	12	CFL	1	2	0	1	4	0	3				Insufficient
19	Block B71-B75	H15	3	12	CFL	1	1	3	3	4	0	2				Insufficient
20	Block B71-B75	H16	3	12	CFL	2	4	3	4	0	1	3				Insufficient
21	Block B71-B75	H17	3	12	CFL	2	2	3	4	2	0	4				Insufficient
22	Block B71-B75	H18	3	12	CFL	2	4	5	3	1	0	2				Insufficient
23	Block B71-B75	H19	3	12	CFL	2	3	3	4	4	1	3				Insufficient
24	Block B71-B75	H20	3	12	CFL	2	6	2	4	5	0	4				Insufficient
25	Block B71-B75	H22	3	12	CFL	2	4	2	6	2	2	0				Insufficient
26	Block B19-B24	H23	9	23	LED	14	31	20	8	6	8	5	28	21	7	
27	Block B19-B24	H24	9	23	LED	13	21	12	3	10	8	4	28	22	7	
28	Block B19-B24	H25	9	23	LED	14	24	26	28	13	7	3	26	18	6	
29	Block B19-B24	H26	9	23	LED	17	28	24	15	11	9	31	10	21	12	
30	Block B19-B24	H27	9	23	LED	17	21	25	16	19	8	28	19	24	8	
31	Block B19-B24	H28	9	23	LED	17	14	31	14	15	12	29	10	18	13	
32	Block B25-B30	H32	3	14	CFL	3	6	2	4	3	5	4				Insufficient
33	Block B25-B30	H34	3	14	CFL	5	4	3	4	5	3	5				Insufficient
34	Block B25-B30	H35	3	14	CFL	4	4	2	6	3	0	14				Insufficient
35	Block B25-B30	H37	3	Single	CFL	5	4	4	6	5	2	4				Insufficient

Sr. No.	Location	Pole tag	Height (m)	Span (m)	Luminary	Average Lux	A1	A2	B1	B2	C1	C2	C3	C4	D4	Remarks
36	Block B25-B30	H38	3	14	CFL	4	5	3	4	3	3	4				Insufficient
37	Block B25-B30	H42	3	14	CFL	5	6	4	4	7	5	6				Insufficient
38	Block B25-B30	H43	3	14	CFL	4	5	4	5	3	2	4				Insufficient
39	Block A25 Main Road		9	24	LED	28	28	17	8	4	8	5	8	25	15	
40	Block A25 Main Road		9	24	LED		55	29	10	22	13	7	36	16	9	
41	Block A25 Main Road		9	24	LED		58	28	10	19	18	10	64	32	13	
42	Block A25 Main Road		9	24	LED		26	16	8	12	9	8	27	18	7	
43	Block C1-C6	H45	3	15	CFL	5	4	5	3	2	1	4				Insufficient
44	Block C1-C6	H46	3	15	CFL	5	6	3	2	2	1	2				Insufficient
45	Block C1-C6	H47	3	15	CFL	4	5	1	3	2	3	2				Insufficient
46	Block C1-C6	H48	3	15	CFL	3	3	5	2	2	3	2				Insufficient
47	Block C1-C6	H49	3	15	CFL	3	4	2	5	1	1	4				Insufficient
48	Block C1-C6	H51	3	15	CFL	5	4	5	3	4	2	1				Insufficient
49	Block C1-C6	H52	3	15	CFL	4	4	5	3	6	5	4				Insufficient

Sr. No.	Location	Pole tag	Height (m)	Span (m)	Luminary	Average Lux	A1	A2	B1	B2	C1	C2	C3	C4	D4	Remarks
50	4 BHK Bunglow Side Street Light		9	20		26	26	19	12	18	15	12	25	20	13	
51	STMR	STMR8	9	24			29	21	6	15	10	5	28	23	7	
52	STMR	STMR7	9	24			27	18	8	13	6	7	24	19	8	
53	STMR	STMR9	9	24			22	20	9	4	6	5	24	20	7	
54	STMR	STMR10	9	24			23	21	16	18	15	8	16	18	10	
55	STMR	STMR11	9	24			25	18	14	16	8	6	19	17	9	
56	Block A28-A35	H57	3	14	CFL	4	3	5	4	3	1	3				Insufficient
57	Block A28-A35	H58	3	14	CFL	7	4	3	4	3	0	1				Insufficient
58	Block A28-A35	H59	3	14	CFL	7	3	3	2	1	0	2				Insufficient
59	Block A28-A35	H60	3	14	CFL	1	4	6	4	3	2	2				Insufficient
60	Block A28-A35	H61	3	14	CFL	3	6	4	3	2	1	2				Insufficient
61	Block A28-A35	H62	3	14	CFL	4	5	4	3	2	1	3				Insufficient
62	Block A28-A35	H63	3	14	CFL	6	4	5	7	5	3	5				Insufficient
63	Block A28-A35	H64	3	14	CFL	4	3	5	2	6	4	1				Insufficient
64	Block A28-A35	H65	3	14	CFL	8	5	3	4	4	1	0				Insufficient
65	Block A28-A35	H66	3	14	CFL	4	3	2	5	4	2	1				Insufficient

Lux measurement sheet refer in Annexure.

3.9 Ceiling Fans & Water Geysers

Installation details

- Two major connected loads in Samundra Township are ceiling fan and water geyser.
- Installation details of these household utilities is mentioned in below table.
- Ceiling fan rated power is 65 W whereas, 1.5 kW geysers are installed.

Table 20 : Ceiling Fan and water geyser installation details

Block Type	No. of Flats	Ceiling Fan Qty.	Water geyser Qty (1.5 kW)
1 BHK	316	632	316
2 BHK	660	1980	660
3 BHK	192	768	384
Bachelor	294	588	294
Total	1462	3968	1654
Total Power in kW		257.92	2481

- Ceiling fans Installed at Samundra Township are AC 1-phase and commercially available that deliver equal or higher air flow rate at nearly 50% of power consumed by conventional 60 W fan.

Particulars	Gorrila ceiling fan	
	Existing Wh	Proposed Wh
Rated (w)	60	28
Wattage Reduction	32	
Nos of Fan	2000	
Working Hr./Annum	3240	
Unit rate Rs.	5.2	
Saving in kWh	207360	
Saving in Rs./Annum	1078272	
Investment in Rs.	4800000	
Payback period in month	53	

Parameter	Detail (Gorilla Energy Efficient Fan)
Span(mm/inch)	1200/48
Service Value/Air Delivery	>7
Input Voltage(V)	140-285
Power Consumption(W)	28
Frequency(Hz)	48-52

Air Delivery(CMM)	220
Power Factor	0.95
No. of Blades	3
Bearing	Deep Groove Double Sided Steel Shielding
Remote Control (10 Keys)	Speed Control, Timer and Sleep Mode
Guarantee	3 Years

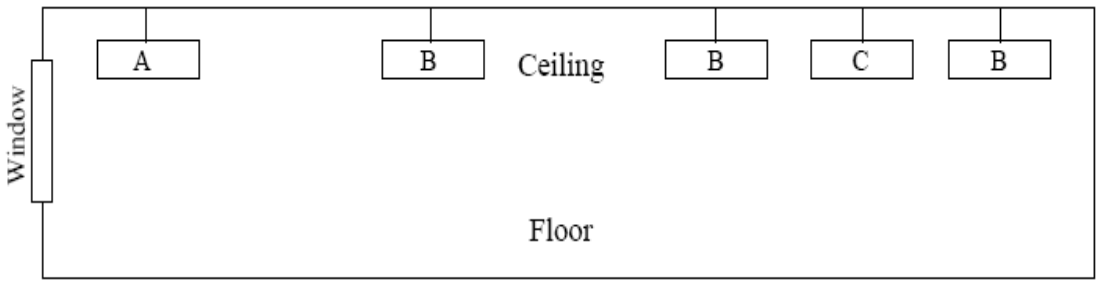
- Present new installation fan, plant head choose BLDC Type fan. 5 Star rating. Rated power consumption is 32 watts.

❖ Intangible Areas of Energy conservation Opportunity at Samudra Township :

Lighting placement and control.

- An example of energy efficient lighting control is illustrated by Figure, which depicts five rows of overhead lights in a workspace. During the brightest part of the day, ample daylight is provided by the window and thus only row C would need to be turned on. At times when daylight levels drop, all B rows would be turned on and row C would be turned off. Only at night or on very dark days would it be necessary to have both rows A and B turned on.

Lighting Placement & Control



- Retrofit by adapting the luminaries already present. (For example, turning on the lighting in the rows away from the windows during the brightest parts of the day and turning on supplemental rows as needed later.)

➢ **Daylighting.**

- Daylighting involves the efficient use of natural light in order to minimize the need for artificial lighting in buildings. Increasing levels of daylight within rooms can reduce electrical lighting loads by up to 70% Unlike conventional skylights, an efficient daylighting system may provide evenly dispersed light without creating heat gains. The reduced heat gains will reduce the need for cooling compared to skylights. Daylighting differs from other energy efficiency measures because its features are integral to the architecture of a building; therefore, it is applied primarily to new buildings and incorporated at the design stage. However, existing buildings can often be costeffectively refitted with daylighting systems. Various daylighting systems are available on the market, some of which can be supplied as kits to retrofit an existing building.

- **High-efficiency Motors, Pumps and Drives.**

- High-efficiency motors reduce energy losses through improved design, better materials, tighter tolerances, and improved manufacturing techniques.
- With proper installation, high-efficiency motors can run cooler than standard motors and can consequently have higher service factors, longer bearing life, longer insulation life, and less vibration.
- Replacing a motor with a high-efficiency motor is often a better choice than rewinding a motor. The practice of rewinding motors currently has no quality or efficiency standards. The efficiency of a motor decreases after rewinding; typically by anywhere from 2-25%. Recent case study data show that new motors are not only more energy efficient, but also reduce overall operation costs. When considering whether to rewind a motor or to replace it with a higher-efficiency model,

- **Turning off lights in unoccupied areas.**

- An easy and effective measure is to encourage personnel to turn off lights in unoccupied building spaces. An energy management program that aims to improve the awareness of personnel with regard to energy use can help staff get in the habit of switching off lights and other equipment when not in use.

- **Replacement of Existing ACs with "7-Star" Natural Refrigerant Rated ACs (R290 Based)**

- **Replacement with Inverter ACs**
  Digital Inverter technology maintains precise control of room temperature and creates a comfortable environment. In conventional split Air Conditioners, the compressor switches off once the set temperature is reached, and switches on again after temperature drops. The time it takes for the Split Air Conditioner to switch on and off causes the room temperature to greatly fluctuate. With Digital Inverter, the inverter control reduces the compressor power once the desired temperature has been reached, but continues operating at a reduced state to maintain a stable room temperature with minimal fluctuations. By putting an end to on/off compressor operation, the inverter technology also allows Digital Inverter to significantly reduce noise levels; Superior reliability has been achieved, due to the reduction of the compressor ON/OFF cycles. Digital DC Inverter Air Conditioners provide this benefit to consumers, helping them to achieve various benefits such as saving of at least 25% of their energy costs. These air conditioners are much quieter and offer higher levels of efficiency as their noisier counterparts. The average AC power consumption as recorded during winter (present time) is about 54.71 KW. This is likely to be 30 to 35% higher during hot season. The average consumption could be put at 60 KW/month over year. The power savings with digital inverter type AC units would at 20% would be 12 KW/month. The annual energy conservation potential of this intervention is: 94,000 kWh/year.
- **Overhaul of Refrigerant Piping Insulation & Filter Maintenance**
  The Gas pipe insulation was found to be damaged at various points on the AC units. Mending / replacement of insulation would improve the performance of AC units. Cleaning of filters of all indoor units and cleaning

of condenser fins by jet pumps. Average life of typical Split Units is considered to be 10 years in dry climates without corrosive pollutants.

- **Optimal AC Temperature Setting**

  Using all Units at Specific Set Points can greatly reduce HVAC energy consumption. It was observed that the set-point for ACs was generally at 19˚ C. All AC units may be set at 23/24 ^{0}C for optimum power consumption. The annual energy conservation potential of this intervention is: 28,500 kWh/year.

- **Enhanced Use of Natural Lighting**

- Natural lighting available at the premises through the existing glass facades needs to be exploited to reduce the lighting load exerted. Currently, most of the glass facades are shielded using vertical-blinds and artificial lighting is used even in areas in the vicinity of glass panes. This intervention has the twin beneficial impact of reducing manufacturing related LCA impacts of lighting fixtures as well as reduced energy consumption. Some green architecture guidelines specify design lighting loads in the vicinity of 7.5 W/sq.m. For building occupancy of 10 hours/day, the average annual electricity conservation and GHG emissions mitigation per sq. m of naturally lit space relative to conventionally lit space is estimated to be 27 kWh/sq.m and 24 kgCO2e/sq. m.

- **Building-Envelope & Air-Conditioned Space Insulation**

- Weather-Stripping of All Doors, especially the main entrance doors into all building cavities.
- Use of Air curtain on Ground Floor Entrance to curtail infiltration losses: Frequenting clients on Ground Floor through main entrance incurs losses due to infiltration. These could be curtailed using Air Curtains. The advantage would be more prominent during summer.

- **Heat Gain Reducing Paint**

- The Heat Gain Reducing Paint technology has the ability to reflect heat causing infrared rays from solar radiation. This intervention was designed to help reduce the internal temperature of the building i.e. reduce heat gain. Certification conducted by the Centre for Energy Studies and Research (CESR, India) indicates that Weather Shield Paints (i.e. solar reflective paints) can reduce the temperatures of walls by upto 50Cand that reflectivity rate for solar radiation through these paints is 0.40 relative to ordinary.
- Currently, the MAIN DOOR of the entrance to the Branch has a significant air-gap between the frame and the door while all back-office doors meant to separate Air Conditioned Spaces from non-conditioned spaces are either missing or kept ajar at all times.
- Exterior wall paint which exhibit a reflectivity rate of 0.21. i.e. these paints are approximately twice as effective in curbing building wall temperature rise due to solar radiation.

❖ Renewable Power Feasibility at Adani House :

- Plant first can install LED lights and then can install solar PV system so that requirement of project kW will be reduce.

Figure 85 Solar Panel Installation on Parking Shed

- Plant can use the parking space or another non utilize space with feasibility study of solar PV panel installation.

❖ Advantages of Water Percolation and Water Harvesting:

- Rainwater harvesting is collecting the run-off from a structure or other impervious surface in order to store it for later use. Traditionally, this involves harvesting the rain from a roof. The rain will collect in gutters that channel the water into downspouts and then into some sort of storage vessel. Rainwater collection systems can be as simple as collecting rain in a rain barrel or as elaborate as harvesting rainwater into large cisterns to supply your entire household demand.
- The idea of rainwater harvesting usually conjures up images of an old farm cistern or thoughts of developing countries. The reality is that rainwater harvesting is becoming a viable alternative for supplying our households and businesses with water. It's not just for the farm anymore! There are many countries such as Germany and Australia where rainwater harvesting is a norm. Due to the green building movement, you will be seeing rainwater harvesting systems become more popular here in America.
- The collection of rainwater is known by many names throughout the world. It ranges from rainwater collection to rainwater harvesting to rainwater catchment. In addition, terms such as roof water collection or rooftop water collection is also used in other countries.
- We believe that rainwater harvesting is a viable technology in an urban setting. All that is necessary to take advantage of this resource is to capture the free water falling on your roof and direct it to a rainwater storage tank. By doing this, you can take control of your water supply and replace all or at least a substantial portion of your water needs. Rainwater harvesting systems can be configured to supply your whole house and/or your landscape needs.

  What are the benefits of rainwater collection?

- Rainwater is a relatively clean and absolutely free source of water
- You have total control over your water supply (ideal for cities with water restrictions)
- It is socially acceptable and environmentally responsible
- It promotes self-sufficiency and helps conserve water
- Rainwater is better for landscape plants and gardens because it is not chlorinated
- It reduces storm water runoff from homes and businesses
- It can solve the drainage problems on your property while providing you with free water
- It uses simple technologies that are inexpensive and easy to maintain
- It can be used as a main source of water or as a backup source to wells and municipal water
- The system can be easily retrofitted to an existing structure or built during new home construction
- System are very flexible and can be modular in nature, allowing expansion, reconfiguration, or relocation, if necessary
- It can provide an excellent back-up source of water for emergencies

What Are the Uses of Collected Rainwater

- You can essentially use rainwater anywhere you use tap water. The idea of using drinking water to flush our toilets and water our lawns is wasteful and irresponsible, especially in light of population growth and water shortages across the country. Rainwater collection is a technique to green your home and to lessen your environmental footprint.

There are basically three areas where rainwater can be used:

- Irrigation use
- Indoor, non-potable use
- Whole house, potable use

Here are some ideas for specific uses of rainwater:

- Hand water your lawn and garden
- Connect rainwater collection system to irrigation/sprinkler system
- Wash your vehicles
- Wash your pets
- Refill your fountains and fish ponds
- Refill your swimming pool
- Replace the use of tap water with rainwater to wash your driveways and sidewalks (if you don't use a broom)
- Use it for all indoor non-potable fixtures (toilets and clothes washer)
- Use it for all potable needs when properly filtered and disinfected
- Use it for industrial processes instead of municipally treated water

How Much Rain Can be Collected?

The amount of rainfall that you can collect is governed by the following formula:

1" of rain x 1 sq. ft. = 0.623 gallons

Or put in an easy form to remember:

1" of rain from 1,000 sq. ft. will provide 623 gallons

To calculate the amount of rainwater you can collect, you need to know your annual average precipitation for your area.

Water Percolation:

In this method rain water collected from the roof of the building is diverted to a storage tank. The storage tank has to be designed according to the water requirements, rainfall and catchment availability. Each drainpipe should have mesh filter at mouth and first flush device followed by filtration system before connecting to the storage tank. It is advisable that each tank should have excess water over flow system.

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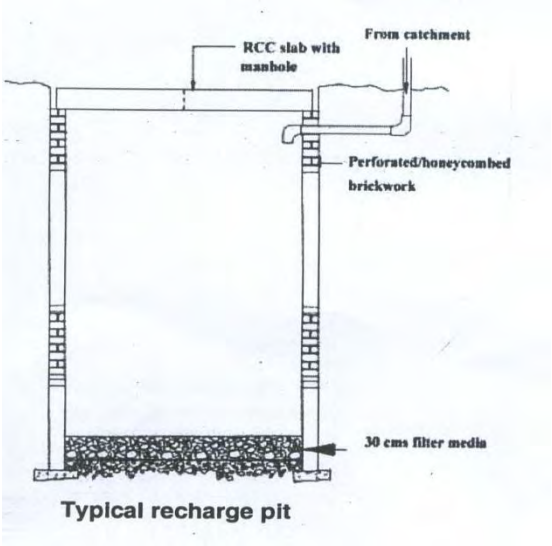
Ground water aquifers can be recharged by various kinds of structures to ensure percolation of rainwater in the ground instead of draining away from the surface. Commonly used recharging methods are:-

a) Recharging of bore wells
b) Recharging of dug wells.
c) Recharge pits
d) Recharge Trenches
e) Soak ways or Recharge Shafts
f) Percolation Tanks

Recharging of bore wells

Rainwater collected from rooftop of the building is diverted through drainpipes to settlement or filtration tank. After settlement filtered water is diverted to bore wells to recharge deep aquifers. Abandoned bore wells can also be used for recharge.

Optimum capacity of settlement tank/filtration tank can be designed on the basis of area of catchment, intensity of rainfall and recharge rate as discussed in design parameters. While recharging, entry of floating matter and silt should be restricted because it may clog the recharge structure. "first one or two shower should be flushed out through rain separator to avoid contamination. This is very important, and all care should be taken to ensure that this has been done."



Typical recharge pit

- Roof or terraces uses for harvesting should be clean, free from dust, algal plants etc.
- Roof should not be painted since most paints contain toxic substances and may peel off.
- Do not store chemicals, rusting iron, manure or detergent on the roof.
- Nesting of birds on the roof should be prevented.
- Terraces should not be used for toilets either by human beings or by pets.
- Provide gratings at mouth of each drainpipe on terraces to trap leaves debris and floating materials.
- Provision of first rain separator should be made to flush off first rains.
- Do not use polluted water to recharge ground water.
- Ground water should only be recharged by rainwater.
- Before recharging, suitable arrangements of filtering should be provided.
- Filter media should be cleaned before every monsoon season.
- During rainy season, the whole system (roof catchment, pipes, screens, first flush, filters, and tanks) should be checked before and after each rain and preferably cleaned after every dry period exceeding a month.
- At the end of the dry season and just before the first shower of rain is anticipated, the storage tank should be scrubbed and flushed off all sediments and debris

3.10 Energy Savings Tips in Residential area

1. **Change your light bulbs** to LEDs.
2. **Wash your clothes in cold water** if possible.
3. **Air seal your home.** Sealing cracks, gaps and leaks and adding insulation can save up to 10% on home heating and cooling costs.
4. **Clean or replace all filters** in your home regularly. Dirty filters make your system work harder and run longer than necessary.
5. **Use your microwave** instead of your stove when cooking.
6. **Defrost your refrigerator and freezer** before ice buildup becomes 1/4-inch thick to ensure your appliances are running efficiently.
7. **During warmer months, close blinds, shades and drapes** on the sunny side of your home to help keep your home's temperature cooler and reduce the work for you AC. Open shades during cooler months to let the sun warm your home.
8. **Don't peek in the oven** while baking! Every time you peek, the temperature can drop 25 F, making your oven use more energy to bring the temperature back up.
9. **Use natural light** when possible.
10. **Control your fixtures** with a photocell or a timer to assure dusk-to-dawn only operation of your outdoor lights.
11. **Don't leave your electronics on** all day long. Only turn on your computer, monitor, printer and fax machine when you need them.
12. **Set your thermostat** to 78F in the summer and 68F in the winter - every degree of extra heating or cooling will increase energy usage 6% to 8%. Setting your thermostat to a lower temperature than normal will not cool your home faster.
13. **Using your ceiling fan** will allow you to raise the thermostat setting about 4°F with no reduction in comfort.
14. **Refrigerators and freezers** actually operate most efficiently when full, so keep your refrigerator and freezer as full as possible (using water bottles if nothing else). Be careful about overfilling them as this will reduce airflow and cause the appliance to work harder.
15. **Using dishwashers and clothes washers/dryers at night** will keep the house cooler, reduce strain on the power grid during the peak usage hours of 4 PM and 6 PM and reduce the chance of an emergency!

16. **Turn off heated dry on your dishwasher** and air dry instead.
17. **Set your refrigerator temperature** to the manufacturer's recommendation to avoid excessive cooling and wasting energy.
18. **Don't leave bathroom or kitchen ventilation fans running** longer than necessary. They replace inside air with outside.
19. **Replace your windows.** If your home has single-pane windows, consider replacing them with more energy efficient windows, or adding solar shades or tinting film.
20. **Install a programmable thermostat** that will automatically adjust the temperature according to your schedule.
21. **Turn off the lights** when they're not in use. Lighting accounts for about 12% of a typical residential utility bill.
22. **Don't leave your mobile phone plugged in** overnight. It only takes a couple of hours to charge.
23. **Turn off the oven** a few minutes before cooking time runs out. Your food will continue to cook without using the extra electricity.
24. **Watch your appliance placement.** Avoid placing appliances that give off heat, such as lamps or TVs, near a thermostat.
25. **Dress for the weather.** When you're at home, dress in warm clothing in the winter and cooler clothing in the summer to stay comfortable without making your heater and AC work harder.

Annexure 1: Motor Load Survey

Equipment Name	Rated kW	Rated Eff %	Voltage	Ampere	kW	P.F	%V^{thd}	%A^{thd}	Loading
Main Irrigation Tank Submersible Pump	11	92	429	16.3	10.29	0.85			86.10
Sprinkler Pump (250kl Tank)	11	92	428	16.2	10.21	0.85			85.37
Adani Hospital & Mitap Submersible Pump	11	92	428	16.2	10.21	0.85			85.37
Club House Tank Submersible Pump	11	92	428	17.0	10.59	0.84			88.54
Club House Tank Pump for Port and Garden	3.7	88	428	7.0	4.36	0.84			103.67
C-12 irrigation tank Pump	3.7	88	428	4.4	2.77	0.85			65.94
Irrigation tank No-5 Pump(25kl Tank)	3.7	88	428	5.0	3.11	0.84			74.05
Samundra Township Temple Back side Pump	5.5	88	428	8.4	5.29	0.85			84.69
Main Gate Tank Pump	3.7	88	428	7.0	4.15	0.80			98.73
pump at customer care office	37.5	86	428	57.0	36.76	0.87			84.30
Aeration Blower (Hz-28.2)	55	93.5	414	49.6	31.30	0.88	3.57	40.88	53.21
Equalization Blower	15	90	421	12.4	5.97	0.66	1.78	2.02	35.81
MBR Blower-1	11	88	426	16.3	7.94	0.66			63.50
MBR Blower-2	11	88	426	15.0	7.19	0.65	2.02	1.16	57.55
RAS V.T Pump No-2	7.5	78.6	425	10.9	6.28	0.78	2.07	2.73	65.83
Horticulture Pump			424	19.2	12.69	0.90	2.32	3.25	

Annexure 2: Feeder wise load

Sr. No	Name	Volts	Amps	P.F	kW	kVAR	KVA	Remarks	VHD	ITHD
1.	Solar Main Incomer	11300	42.92	0.938	787.93	291.18	840.01			
2.	Solar Outgoing B-24	11060	25.39	0.99	481.51	68.61	486.37			
3.	Solar Outgoing A-18	11050	18.23	0.99	345.41	49.22	348.90			
4.	Main Panel FP-08	433	5.6	0.93	3.91	1.54	4.20		5.6	34.1
		434	7.4	0.94	5.23	1.90	5.56			
		433	21	0.96	15.12	4.41	15.75			
5.	B14 Main Incomer	434	0	0	0.00	0	0	No load		
		434	4.71	0.98	3.47	0.70	3.54		2.55	9.61
		433	0	0	0.00	0	0	No load		
6.	B15 Main Incomer	436	2.37	0.96	1.72	0.50	1.79			
		437	5.7	0.99	4.27	0.61	4.31			
		437	15.12	0.99	11.33	1.61	11.44		2.87	3.94
7.	B13 Main Incomer	435	1.57	0.97	1.15	0.29	1.18			
		436	0.57	0.97	0.42	0.10	0.43			
		437	15.8	0.98	11.72	2.38	11.96		2.66	4.94
8.	Main Incomer FP-07	433	12.5	0.97	9.09	2.28	9.37		2.6	7.9
		434	2.6	0.95	1.86	0.61	1.95			
		433	0	0	0.00	0	0	No load		
9.	B 16 Main Incomer	433	0	0	0.00	0	0	No load		
		434	1.53	0.98	1.13	0.23	1.15			

Sr. No	Name	Volts	Amps	P.F	kW	kVAR	KVA	Remarks	VHD	ITHD
		434	0.79	0.98	0.58	0.12	0.59			
10.	B 17 Main Incomer	434	2.13	0.98	1.57	0.32	1.60			
		434	1.57	0.98	1.16	0.23	1.18			
		432	0.87	0.96	0.62	0.18	0.65			
11.	B 18 Main Incomer	432	8.85	0.91	6.03	2.75	6.62		2.08	19.69
		434	0	0	0.00	0	0			
		433	0	0	0.00	0	0			
12.	Street Light	434	0	0	0.00	0	0			
		434	0.94	0.98	0.69	0.14	0.71			
		436	1.03	0.99	0.77	0.11	0.78			
13.	Customer Care Panel	438	60.06	0.76	34.63	29.61	45.56			
		438	55.79	0.74	31.32	28.47	42.32			
		437	57.76	0.78	34.10	27.36	43.72			
14.	B-09 F Main Incomer	438	3.75	0.96	2.73	0.80	2.84			
		437	31.5	0.98	23.37	4.74	23.84			
		438	7.29	0.96	5.31	1.55	5.53			
15.	B 16F Main Incomer	434	21.22	0.97	15.47	3.88	15.95		2.72	17.28
		434	22.37	0.96	16.14	4.71	16.82			
		434	4.37	0.96	3.15	0.92	3.28			
16.	Feeder Panel 09 Main Incomer	440	2.89	0.72	1.59	1.53	2.20			
		439	4.6	0.76	2.66	2.27	3.50			

Sr. No	Name	Volts	Amps	P.F	kW	kVAR	KVA	Remarks	VHD	ITHD
		439	0	0	0.00	0	0	No load		
17.	B 10 Main Incomer	434	0	0	0.00	0	0	No load		
		434	0	0	0.00	0	0	No load		
		434	0	0	0.00	0	0	No load		
18.	B11 Main Incomer	437	0.76	0.94	0.54	0.20	0.58			
		438	4.5	0.95	3.24	1.07	3.41			
		438	0	0	0.00	0	0	No load		
19.	B12 Main Incomer	438	0	0	0.00	0	0	No load		
		437	0	0	0.00	0	0	No load		
		437	0	0	0.00	0	0	No load		
20.	Feeder Panel 10 Main Incomer	440	2.01	0.75	1.15	1.01	1.53			
		438	4.18	0.78	2.47	1.98	3.17			
		439	4.34	0.8	2.64	1.98	3.30			
21.	B-08 Main Incomer	438	0	0	0.00	0	0	No load		
		439	0	0	0.00	0	0	No load		
		439	0	0	0.00	0	0	No load		
22.	B-07 Main Incomer	437	2.72	0.92	1.89	0.81	2.06			
		438	0	0	0.00	0	0	No load		
		439	0	0	0.00	0	0	No load		
23.	B-09 Main Incomer	439	0	0	0.00	0	0	No load		
		438	0	0	0.00	0	0	No load		

Sr. No	Name	Volts	Amps	P.F	kW	kVAR	KVA	Remarks	VHD	ITHD
		438	0	0	0.00	0	0	No load		
24.	B4 Main Incomer	441	21	0.99	15.88	2.26	16.04			
		440	22.5	0.98	16.80	3.41	17.15			
		440	13.7	0.95	9.92	3.26	10.44			
25.	Feeder Panel-11	441	16.2	0.94	11.63	4.22	12.37			
		440	0.9	0.79	0.54	0.42	0.69			
		441	2.29	0.68	1.19	1.28	1.75			
26.	B-04 Main Incomer	441	14.77	0.95	10.72	3.52	11.28			
		440	0.87	0.94	0.62	0.23	0.66			
		441	0.65	0.93	0.46	0.18	0.50			
27.	B-06 Main Incomer	440	0.6	0.78	0.36	0.29	0.46			
		439	0.7	0.76	0.40	0.35	0.53			
		438	0.9	0.76	0.52	0.44	0.68			
28.	B-01 Main Incomer	438	1.32	0.81	0.81	0.59	1.00		2.1	34.55
		439	0.7	0.8	0.43	0.32	0.53			
		436	0.55	0.74	0.31	0.28	0.42			
29.	B-02 Main Incomer	438	2.11	0.88	1.41	0.76	1.60			
		438	1.98	0.89	1.34	0.68	1.50			
		439	2.62	0.88	1.75	0.95	1.99			
30.	B-03 Main Incomer	438	1.71	0.95	1.23	0.41	1.30			
		439	1.16	0.96	0.85	0.25	0.88			

Sr. No	Name	Volts	Amps	P.F	kW	kVAR	KVA	Remarks	VHD	ITHD
		438	0.75	0.94	0.53	0.19	0.57			
31.	APL Hostel Main Incomer	440	26.6	0.99	20.07	2.86	20.27			
		439	24.88	0.98	18.54	3.76	18.92			
		439	14.6	0.96	10.66	3.11	11.10			
32.	APL Hostel Main Incomer 1F4	440	14.45	0.95	10.46	3.44	11.01			
		438	0	0	0.00	0	0			
		439	2.75	0.95	1.99	0.65	2.09			
33.	Street Light Hostel APL 2F2	440	4.6	0.78	2.73	2.19	3.51			
		438	1.6	0.82	1.00	0.69	1.21			
		439	0.48	0.81	0.30	0.21	0.36			
34.	Street Light Hostel APL 2F3	439	11.6	0.94	8.29	3.01	8.82			
		438	4.57	0.95	3.29	1.08	3.47			
		439	17.1	0.97	12.61	3.16	13.00			
35.	Street Light Hostel APL 2F4	438	1.8	0.96	1.31	0.38	1.37			
		439	5.9	0.97	4.35	1.09	4.49			
		438	3	0.96	2.18	0.64	2.28			
36.	Street Light Hostel APL 2F5	437	0.1	0.74	0.06	0.05	0.08			
		439	0.6	0.76	0.35	0.30	0.46			
		437	0.8	0.76	0.46	0.39	0.61			
37.	Feeder Panel 01 Main Incomer	425	7.6	0.93	5.20	2.06	5.59			
		426	4.5	0.94	3.12	1.13	3.32			

Sr. No	Name	Volts	Amps	P.F	kW	kVAR	KVA	Remarks	VHD	ITHD
		429	6.54	0.96	4.67	1.36	4.86			
38.	A-04 Main Incomer	434	0.98	0.68	0.50	0.54	0.74			
		436	0.55	0.72	0.30	0.29	0.42			
		436	1.1	0.74	0.61	0.56	0.83			
39.	A-05 Main Incomer	434	1	0.82	0.62	0.43	0.75			
		436	0.58	0.84	0.37	0.24	0.44			
		437	0.98	0.85	0.63	0.39	0.74			
40.	A-06 Main Incomer	438	2.47	0.86	1.61	0.96	1.87			
		439	0.83	0.86	0.54	0.32	0.63			
		439	0.81	0.84	0.52	0.33	0.62			
41.	A-02 to A 03 Main Incomer	435	4.25	0.94	3.01	1.09	3.20			
		438	2.35	0.93	1.66	0.66	1.78			
		439	12.6	0.98	9.39	1.91	9.58			
42.	Feeder Panel 02 Main Incomer	438	19.5	0.97	14.35	3.60	14.79			
		439	3.8	0.94	2.72	0.99	2.89			
		438	4.5	0.96	3.28	0.96	3.41			
43.	A07 Main Incomer	438	0.3	0.94	0.21	0.08	0.23			
		439	0.4	0.95	0.29	0.09	0.30			
		438	1.2	0.96	0.87	0.25	0.91			
44.	A 09 Main incomer	439	15.2	0.94	10.86	3.94	11.56			
		438	0.9	0.85	0.58	0.36	0.68			

Sr. No	Name	Volts	Amps	P.F	kW	kVAR	KVA	Remarks	VHD	ITHD
		439	0.4	0.86	0.26	0.16	0.30			
45.	A 10 Main Incomer	438	0.9	0.92	0.63	0.27	0.68			
		439	1.1	0.91	0.76	0.35	0.84			
		438	1	0.92	0.70	0.30	0.76			
46.	Feeder Panel 03 Main Incomer	436	27.4	0.99	20.48	2.92	20.69			
		436	9.66	0.98	7.15	1.45	7.29			
		434	34.88	0.98	25.69	5.22	26.22			
47.	A 16 to A 17 Main Incomer	437	0.9	0.85	0.58	0.36	0.68			
		438	1	0.87	0.66	0.37	0.76			
		438	14.2	0.95	10.23	3.36	10.77			
48.	A 15 Main Incomer	438	0.8	0.92	0.56	0.24	0.61			
		439	1.1	0.92	0.77	0.33	0.84			
		438	0.5	0.94	0.36	0.13	0.38			
49.	A-14 Main Incomer	437	0.6	0.95	0.43	0.14	0.45			
		437	0.8	0.94	0.57	0.21	0.61			
		439	0.8	0.95	0.58	0.19	0.61			
50.	A-13 Main Incomer	438	2.1	0.95	1.51	0.50	1.59			
		439	0.8	0.94	0.57	0.21	0.61			
		438	13.6	0.95	9.80	3.22	10.32			
51.	Feeder Panel 04 Main Incomer	436	4.92	0.97	3.60	0.90	3.72		2	15.2
		437	4.97	0.98	3.69	0.75	3.76			

Sr. No	Name	Volts	Amps	P.F	kW	kVAR	KVA	Remarks	VHD	ITHD
		438	6.12	0.96	4.46	1.30	4.64			
52.	A 21 Main Incomer	436	12.6	0.97	9.23	2.31	9.51			
		437	1.55	0.94	1.10	0.40	1.17			
		438	0.55	0.93	0.39	0.15	0.42			
53.	A 20 Main Incomer	438	0.78	0.95	0.56	0.18	0.59			
		437	1.66	0.94	1.18	0.43	1.26			
		439	0.7	0.95	0.51	0.17	0.53			
54.	A 19 Main Incomer	438	0.87	0.91	0.60	0.27	0.66			
		439	1.12	0.94	0.80	0.29	0.85			
		439	1.15	0.95	0.83	0.27	0.87			
55.	Feeder Panel 05 Main Incomer	437	9.1	0.99	6.82	0.97	6.89			
		438	8.82	0.95	6.36	2.09	6.69			
		439	3.22	0.94	2.30	0.84	2.45			
56.	A22 Main Incomer	438	14.2	0.96	10.34	3.02	10.77			
		439	1.25	0.94	0.89	0.32	0.95			
		437	1.19	0.96	0.86	0.25	0.90			
57.	A 23 Main Incomer	439	1.78	0.96	1.30	0.38	1.35			
		436	1.26	0.95	0.90	0.30	0.95			
		439	0.85	0.93	0.60	0.24	0.65			
58.	A 24 Main Incomer	437	1.65	0.95	1.19	0.39	1.25			
		438	1.4	0.94	1.00	0.36	1.06			

Sr. No	Name	Volts	Amps	P.F	kW	kVAR	KVA	Remarks	VHD	ITHD
		436	0.6	0.94	0.43	0.15	0.45			
59.	Feeder Panel 06 Main Incomer	436	5.1	0.96	3.70	1.08	3.85			
		437	24.2	0.94	17.22	6.25	18.32			
		438	2.33	0.95	1.68	0.55	1.77			
60.	A27 Main Incomer	434	0	0	0.00	0	0			
		436	0	0	0.00	0	0			
		435	0	0	0.00	0	0			
61.	A26 Main Incomer	436	0	0	0.00	0	0			
		437	1.22	0.96	0.89	0.26	0.92			
		436	0.69	0.94	0.49	0.18	0.52			
62.	A 25 Main Incomer	438	1	0.78	0.59	0.47	0.76			
		436	5.1	0.81	3.12	2.26	3.85			
		434	1.22	0.82	0.75	0.52	0.92			
63.	Feeder Panel 13 Main Incomer	414	25.7	0.99	18.24	2.60	18.43		0.6	4.6
		415	3.13	0.98	2.20	0.45	2.25			
		414	4.5	0.98	3.16	0.64	3.23			
64.	C -3 Main Incomer	415	12.2	0.98	8.59	1.75	8.77			
		413	3.13	0.97	2.17	0.54	2.24			
		414	1.37	0.98	0.96	0.20	0.98			
65.	C-1 Main Incomer	414	12.89	0.97	8.97	2.25	9.24			
		413	0.49	0.98	0.34	0.07	0.35			

Sr. No	Name	Volts	Amps	P.F	kW	kVAR	KVA	Remarks	VHD	ITHD
		414	0.87	0.98	0.61	0.12	0.62			
66.	C-2 Main Incomer	415	0.44	0.96	0.30	0.09	0.32			
		413	0.51	0.97	0.35	0.09	0.36			
		415	2.16	0.98	1.52	0.31	1.55			
67.	Feeder Panel -14 Main Incomer	414	3.81	0.83	2.27	1.52	2.73		1.93	38.24
		413	15.85	0.92	10.43	4.44	11.34			
		416	18.61	0.93	12.47	4.93	13.41			
68.	C5 Main Incomer	414	1.03	0.91	0.67	0.31	0.74			
		413	1.68	0.92	1.11	0.47	1.20			
		414	3.11	0.93	2.07	0.82	2.23			
69.	C4 Main Incomer	415	2	0.93	1.34	0.53	1.44			
		414	2.55	0.91	1.66	0.76	1.83			
		413	15.5	0.94	10.42	3.78	11.09			
70.	Feeder Panel 15 Main Incomer	415	19.7	0.96	13.59	3.96	14.16		1.7	13.79
		416	18.4	0.96	12.73	3.71	13.26			
		415	21.7	0.96	14.97	4.37	15.60			
71.	C11 Main Incomer	414	7.45	0.94	5.02	1.82	5.34			
		416	13.21	0.96	9.14	2.67	9.52			
		414	10.4	0.96	7.16	2.09	7.46			
72.	Market Shopping Center	415	6.45	0.94	4.36	1.58	4.64			
		416	9.7	0.95	6.64	2.18	6.99			

Sr. No	Name	Volts	Amps	P.F	kW	kVAR	KVA	Remarks	VHD	ITHD
		415	7.5	0.93	5.01	1.98	5.39			
73.	4 BHK Bungalows	414	0.18	0.84	0.11	0.07	0.13			
		415	0.27	0.86	0.17	0.10	0.19			
		416	0.15	0.88	0.10	0.05	0.11			
74.	Feeder Panel -16 Main Incomer	408	16.2	0.98	11.22	2.28	11.45		1.8	6.5
		410	14.03	0.96	9.56	2.79	9.96			
		411	10.92	0.96	7.46	2.18	7.77			
75.	C10 Main Incomer	411	3.56	0.98	2.48	0.50	2.53			
		410	9.97	0.98	6.94	1.41	7.08			
		411	5.14	0.96	3.51	1.02	3.66			
76.	Irrigation Pump	410	6.02	0.91	3.89	1.77	4.27			
		412	6.23	0.92	4.09	1.74	4.45			
		413	4.36	0.92	2.87	1.22	3.12			
77.	Feeder Panel -17 Main Incomer	416	12.6	0.98	8.90	1.81	9.08		1.7	14.67
		414	16.9	0.97	11.75	2.95	12.12			
		414	14.82	0.98	10.41	2.11	10.63			
78.	C13 Main Incomer	413	14.5	0.97	10.06	2.52	10.37			
		415	5.3	0.96	3.66	1.07	3.81			
		415	0.8	0.96	0.55	0.16	0.58			
79.	C12 Main Incomer	414	10	0.82	5.88	4.10	7.17			
		413	0.75	0.84	0.45	0.29	0.54			

Sr. No	Name	Volts	Amps	P.F	kW	kVAR	KVA	Remarks	VHD	ITHD
		414	1.6	0.86	0.99	0.59	1.15			
80.	Feeder Panel 18 Main Incomer	416	2.32	0.78	1.30	1.05	1.67		1.8	41.5
		415	2.59	0.82	1.53	1.07	1.86			
		416	8.17	0.81	4.77	3.45	5.89			
81.	C34 Main Incomer	417	0.78	0.89	0.50	0.26	0.56			
		416	1.2	0.88	0.76	0.41	0.86			
		417	5.35	0.89	3.44	1.76	3.86			
82.	C 35 Main Incomer	416	0.85	0.78	0.48	0.38	0.61			
		418	0.96	0.79	0.55	0.43	0.70			
		417	2.8	0.82	1.66	1.16	2.02			
83.	Temple Light	416	0.33	0.92	0.22	0.09	0.24			
		417	0.6	0.91	0.39	0.18	0.43			
		416	0.37	0.92	0.25	0.10	0.27			
84.	Feeder Panel -19 Main Incomer	420	4.17	0.84	2.55	1.65	3.03			
		419	2.02	0.86	1.26	0.75	1.47			
		418	1.28	0.88	0.82	0.44	0.93			
85.	C-32 Main Incomer	418	0.95	0.84	0.58	0.37	0.69			
		419	0.82	0.84	0.50	0.32	0.60			
		417	1.73	0.83	1.04	0.70	1.25			
86.	C33 Main Incomer	418	1.5	0.86	0.93	0.55	1.09			
		416	0.78	0.86	0.48	0.29	0.56			

Sr. No	Name	Volts	Amps	P.F	kW	kVAR	KVA	Remarks	VHD	ITHD
		417	1.02	0.86	0.63	0.38	0.74			
87.	C 29 Main Incomer	418	2.9	0.92	1.93	0.82	2.10			
		417	2.7	0.92	1.79	0.76	1.95			
		416	1.02	0.92	0.68	0.29	0.73			
88.	Feeder Panel 20 Main Incomer	420	2.22	0.98	1.58	0.32	1.61			
		417	4.2	0.98	2.97	0.60	3.03			
		419	3.9	0.98	2.77	0.56	2.83			
89.	C28 Main Incomer	418	2.08	0.94	1.42	0.51	1.51			
		417	0.58	0.94	0.39	0.14	0.42			
		417	1.61	0.95	1.10	0.36	1.16			
90.	Feeder Panel -39 Main Incomer	420	3.36	0.99	2.42	0.34	2.44			
		417	12.6	0.99	9.01	1.28	9.10			
		416	12.9	0.99	9.20	1.31	9.29			
91.	Terrace Light	416	2.45	0.94	1.66	0.60	1.77			
		414	0.2	0.93	0.13	0.05	0.14			
		416	0.95	0.93	0.64	0.25	0.68			
92.	Road Light	417	1.45	0.91	0.95	0.43	1.05			
		415	2.45	0.93	1.64	0.65	1.76			
		416	3.01	0.94	2.04	0.74	2.17			
93.	Cricket Ground Panel	417	13.4	0.99	9.58	1.37	9.68		1.4	0
		416	12.2	0.98	8.61	1.75	8.79			

Sr. No	Name	Volts	Amps	P.F	kW	kVAR	KVA	Remarks	VHD	ITHD
		417	12.7	0.99	9.08	1.29	9.17			
94.	Feeder Panel 38 Main Incomer	419	2.87	0.98	2.04	0.41	2.08		1.3	0
		418	0	0	0.00	0	0			
		419	2.55	0.98	1.81	0.37	1.85			
95.	A32 Main Incomer	418	13.4	0.99	9.60	1.37	9.70		1.4	0.5
		418	1.56	0.98	1.11	0.22	1.13			
		419	0.84	0.9	0.55	0.27	0.61			
96.	A-44 Main Incomer	418	13.08	0.98	9.28	1.88	9.47			
		419	1.11	0.97	0.78	0.20	0.81			
		418	0.43	0.97	0.30	0.08	0.31			
97.	A 45 Main Incomer	414	0.27	0.97	0.19	0.05	0.19			
		417	0.65	0.96	0.45	0.13	0.47			
		415	0.41	0.97	0.29	0.07	0.29			
98.	Feeder Panel 36 Main Incomer	418	2.91	0.77	1.62	1.34	2.11		1.46	6.42
		417	11.9	0.99	8.51	1.21	8.59		1.6	5.4
		419	2.75	0.75	1.50	1.32	2.00		1.54	6.4
99.	A 40 Main Incomer	418	0.31	0.91	0.20	0.09	0.22			
		419	0.14	0.92	0.09	0.04	0.10			
		418	0.81	0.9	0.53	0.26	0.59			
100.	A41 Main Incomer	418	0.32	0.97	0.22	0.06	0.23			
		419	2.75	0.96	1.92	0.56	2.00			

Sr. No	Name	Volts	Amps	P.F	kW	kVAR	KVA	Remarks	VHD	ITHD
		418	1.41	0.98	1.00	0.20	1.02			
101.	A 42 Main Incomer	418	0.31	0.98	0.22	0.04	0.22			
		419	7.22	0.98	5.13	1.04	5.24			
		418	0.35	0.97	0.25	0.06	0.25			
102.	A 43 Main Incomer	418	1.12	0.98	0.79	0.16	0.81			
		417	0.61	0.97	0.43	0.11	0.44			
		419	0.43	0.99	0.31	0.04	0.31			
103.	Feeder Panel-35 Main Incomer	419	5.09	0.73	2.70	2.52	3.69		1.4	61.55
		418	3.34	0.63	1.52	1.88	2.42		1.61	64.43
		418	2.1	0.61	0.93	1.20	1.52		1.5	59.6
104.	A 36 Main Incomer	418	0.93	0.8	0.54	0.40	0.67			
		417	0.45	0.9	0.29	0.14	0.33			
		418	0.61	0.83	0.37	0.25	0.44			
105.	A37 Main Incomer	417	0.85	0.97	0.60	0.15	0.61			
		418	0.45	0.96	0.31	0.09	0.33			
		419	0.35	0.9	0.23	0.11	0.25			
106.	A 38 Main Incomer	418	1.8	0.97	1.26	0.32	1.30			
		419	1.14	0.94	0.78	0.28	0.83			
107.	A 39 Main Incomer	418	0.78	0.96	0.54	0.16	0.56			
		417	0.64	0.96	0.44	0.13	0.46			
		418	0.2	0.96	0.14	0.04	0.14			

Sr. No	Name	Volts	Amps	P.F	kW	kVAR	KVA	Remarks	VHD	ITHD
108.	Feeder Panel 34 Main Incomer	421	15.8	0.98	11.29	2.29	11.52		1.4	13.6
		420	3.32	0.98	2.37	0.48	2.42			
		419	0	0	0.00	0	0			
109.	A 32 Main Incomer	420	0.45	0.96	0.31	0.09	0.33			
		419	0.63	0.94	0.43	0.16	0.46			
		418	0.97	0.94	0.66	0.24	0.70			
110.	A 33 Main Incomer	418	0.33	0.95	0.23	0.07	0.24			
		419	1.8	0.95	1.24	0.41	1.31			
		418	0.45	0.94	0.31	0.11	0.33			
111.	A 34 Main Incomer	418	0.62	0.93	0.42	0.16	0.45			
		418	1.14	0.93	0.77	0.30	0.83			
		419	1.27	0.94	0.87	0.31	0.92			
112.	A 35 Main Incomer	417	0.36	0.97	0.25	0.06	0.26			
		418	13.1	0.96	9.10	2.66	9.48			
		418	0.41	0.97	0.29	0.07	0.30			
113.	Street Light Sector - 7 Panel	418	2.18	0.96	1.52	0.44	1.58			
		419	2.29	0.97	1.61	0.40	1.66			
		417	2.29	0.96	1.59	0.46	1.65			
114.	Feeder Panel 33 Main Incomer	420	3.76	0.97	2.65	0.66	2.74		1.5	49.5
		421	3.55	0.96	2.49	0.72	2.59			
		419	2.96	0.97	2.08	0.52	2.15			

Sr. No	Name	Volts	Amps	P.F	kW	kVAR	KVA	Remarks	VHD	ITHD
115.	A 28 Main Incomer	417	0.95	0.96	0.66	0.19	0.69			
		418	0.56	0.97	0.39	0.10	0.41			
		418	1.5	0.96	1.04	0.30	1.09			
116.	A 29 Main Incomer	418	0.8	0.97	0.56	0.14	0.58			
		418	1.2	0.97	0.84	0.21	0.87			
		417	0.36	0.96	0.25	0.07	0.26			
117.	A 30 Main Incomer	417	1.74	0.98	1.23	0.25	1.26			
		418	1.41	0.97	0.99	0.25	1.02			
		419	1.1	0.98	0.78	0.16	0.80			
118.	A 31 Main Incomer	417	0.5	0.94	0.34	0.12	0.36			
		419	0.15	0.95	0.10	0.03	0.11			
		417	0.32	0.95	0.22	0.07	0.23			
119.	Feeder Panel 40 Main Incomer	420	6.03	0.99	4.34	0.62	4.39		1.65	
		417	3.39	0.98	2.40	0.49	2.45			
		417	3.74	0.99	2.67	0.38	2.70			
120.	Samudra Office	418	0.95	0.98	0.67	0.14	0.69			
		417	0.1	0.98	0.07	0.01	0.07			
		418	0.96	0.96	0.67	0.19	0.70			
121.	Gate HM Tower	418	4.97	0.97	3.49	0.87	3.60			
		419	3.22	0.96	2.24	0.65	2.34			
		418	1.64	0.97	1.15	0.29	1.19			

Sr. No	Name	Volts	Amps	P.F	kW	kVAR	KVA	Remarks	VHD	ITHD
122.	Feeder Panel 41 Main Incomer	420	19.5	0.99	14.04	2.00	14.19			
123.	B 54 Main Incomer	418	1.8	0.97	1.26	0.32	1.30			
		419	1.25	0.98	0.89	0.18	0.91			
		418	0.55	0.98	0.39	0.08	0.40			
124.	B 53 Main Incomer	417	1.41	0.97	0.99	0.25	1.02			
		418	1.54	0.98	1.09	0.22	1.11			
		419	0.82	0.98	0.58	0.12	0.60			
125.	B 51 Main Incomer	417	0.74	0.94	0.50	0.18	0.53			
		418	0.75	0.95	0.52	0.17	0.54			
		417	1.17	0.95	0.80	0.26	0.85			
126.	B 52 Main Incomer	418	0.88	0.97	0.62	0.15	0.64			
		417	1.82	0.95	1.25	0.41	1.31			
		416	0	0	0.00	0	0			
127.	B 55 Main Incomer	417	1.56	0.96	1.08	0.32	1.13			
		418	1.3	0.96	0.90	0.26	0.94			
		419	1.85	0.95	1.28	0.42	1.34			
128.	B 58 Main Incomer	418	2.02	0.99	1.45	0.21	1.46			
		419	1.37	0.97	0.96	0.24	0.99			
		418	0.94	0.97	0.66	0.17	0.68			
129.	Ports Hostel Panel	417	13	0.98	9.20	1.87	9.39			
		419	0.88	0.97	0.62	0.16	0.64			

Sr. No	Name	Volts	Amps	P.F	kW	kVAR	KVA	Remarks	VHD	ITHD
		418	0.8	0.98	0.57	0.12	0.58			
130.	Voda phone Office	417	0.22	0.96	0.15	0.04	0.16			
		418	0.54	0.97	0.38	0.10	0.39			
		418	10.2	0.98	7.24	1.47	7.38			
131.	Street Light	417	3.5	0.95	2.40	0.79	2.53			
		418	3.45	0.97	2.42	0.61	2.50			
132.	A 15F Main Incomer	418	0.5	0.98	0.35	0.07	0.36			
		417	3.42	0.98	2.42	0.49	2.47			
		419	4.44	0.99	3.19	0.45	3.22			
133.	A 04F Main Incomer	417	7.22	0.97	5.06	1.27	5.21			
		419	3.44	0.96	2.40	0.70	2.50			
		418	4.45	0.98	3.16	0.64	3.22			
134.	A 20F Main Incomer	418	3.42	0.96	2.38	0.69	2.48			
		419	3.51	0.97	2.47	0.62	2.55			
		418	3.58	0.96	2.49	0.73	2.59			
135.	A 23F Main Incomer	417	2.54	0.98	1.80	0.37	1.83			
		418	2.26	0.97	1.59	0.40	1.64			
		419	2.18	0.96	1.52	0.44	1.58			
136.	A 09 Main incomer	418	17.2	0.96	11.95	3.49	12.45			
		417	2.8	0.98	1.98	0.40	2.02			
		417	1.9	0.98	1.34	0.27	1.37			

Sr. No	Name	Volts	Amps	P.F	kW	kVAR	KVA	Remarks	VHD	ITHD
137.	Feeder Panel 25 Main Incomer	416	8.41	0.93	5.64	2.23	6.06		2.1	23.5
		417	6.8	0.92	4.52	1.92	4.91			
		416	7.8	0.94	5.28	1.92	5.62			
138.	B-75 Main Incomer	417	0.78	0.93	0.52	0.21	0.56			
		416	1.49	0.96	1.03	0.30	1.07			
		417	1.31	0.96	0.91	0.26	0.95			
139.	B 74 Main Incomer	416	1.74	0.97	1.22	0.30	1.25			
		417	1.75	0.96	1.21	0.35	1.26			
		418	0	0	0.00	0	0			
140.	B 76 Main Incomer	417	0.91	0.91	0.60	0.27	0.66			
		416	2.06	0.92	1.37	0.58	1.48			
		417	0	0	0.00	0	0			
141.	Main Road Street Light	418	5.12	0.94	3.48	1.26	3.71			
		417	3.38	0.95	2.32	0.76	2.44			
		418	3.94	0.94	2.68	0.97	2.85			
142.	Feeder Panel 26 Main Incomer	417	14.8	0.98	10.48	2.13	10.69		1.9	9.88
		418	16.19	0.97	11.37	2.85	11.72			
		417	6.34	0.98	4.49	0.91	4.58			
143.	B-73 Main Incomer	418	0	0	0.00	0	0			
		417	16.3	0.98	11.54	2.34	11.77			
		419	2.55	0.97	1.80	0.45	1.85			

Sr. No	Name	Volts	Amps	P.F	kW	kVAR	KVA	Remarks	VHD	ITHD
144.	B72 Main Incomer	417	1.51	0.98	1.07	0.22	1.09			
		418	1.22	0.97	0.86	0.21	0.88			
		419	2.55	0.98	1.81	0.37	1.85			
145.	B 71 Main Incomer	418	0.61	0.93	0.41	0.16	0.44			
		419	0.61	0.94	0.42	0.15	0.44			
		419	1.27	0.95	0.88	0.29	0.92			
146.	Feeder Panel 27 Main Incomer	417	16.5	0.99	11.80	1.68	11.92		1.2	10.8
		418	14.44	0.98	10.25	2.08	10.45			
		419	13.97	0.97	9.83	2.46	10.14			
147.	B-68 Main Incomer	417	1.51	0.94	1.03	0.37	1.09			
		419	0.78	0.95	0.54	0.18	0.57			
		417	2.35	0.94	1.60	0.58	1.70			
148.	B-69 Main Incomer	417	1.26	0.93	0.85	0.33	0.91			
		419	0.5	0.94	0.34	0.12	0.36			
		417	5.71	0.96	3.96	1.15	4.12			
149.	B-70 Main Incomer	418	0.79	0.96	0.55	0.16	0.57			
		416	14.4	0.97	10.06	2.52	10.38			
		419	2.56	0.96	1.78	0.52	1.86			
150.	Market Shopping Center	419	7.29	0.97	5.13	1.29	5.29			
		418	3.65	0.96	2.54	0.74	2.64			
		416	8.98	0.96	6.21	1.81	6.47			

Annexure-IV Lighting Section Energy Saving Opportunities

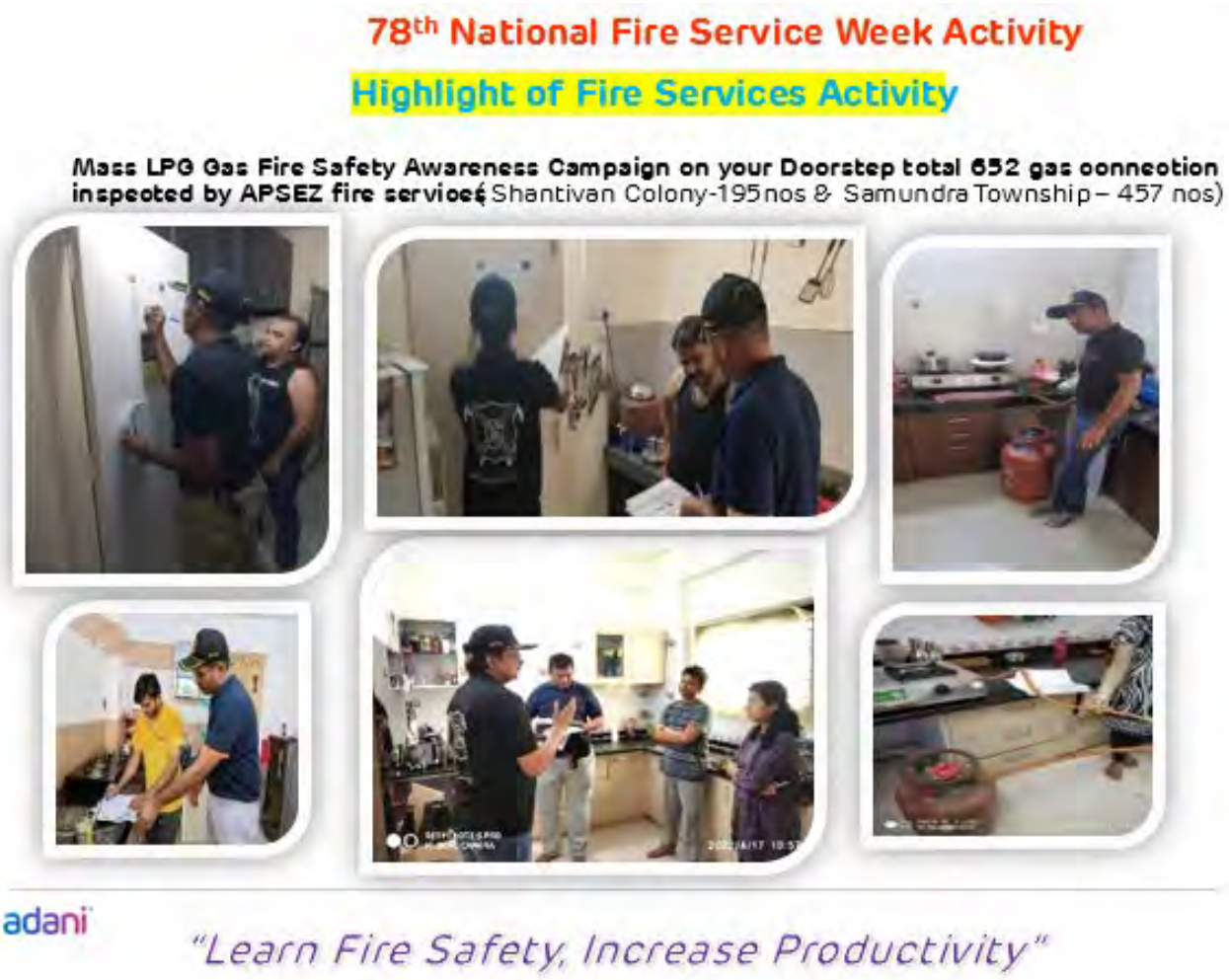
Sr. No.	Description	Action from Adani Side/Auditor comment
1	Replacement with LED	Already taken care by plant, However good quality purchase will important like driver, dimming factor, harmonics etc.
2	Supply Voltage Reduction	Not Feasible due to LED installations
3	Illumination Reduction by switching OFF or Dimming fixtures	Feasible as per requirement of GMP and actual lux
4	Day Light Areas Fixture OFF, In some rooms few lights are close to window and rest lights are away from window	Individual switches are required for any zigzag switching, timer ckt., day light side
5	Motion Sensors	Plant to review same in low movement areas where lights are continuous ON
6	Light Pipe	Can be Installed
7	Street Light- GPS based control, timer control	major savings in Port type plant due to good awareness
8	Conventional and other type of fixture	Not in place, so no comment
9	ECBC, design related points	Essential to conduct dedicated audit
10	Wall to Window Ratio	Not to increase as cost of HVAC is high than Illumination

Intangible savings on air conditioners:

“Each degree increase in the AC temperature can save about 3-5% electricity,". Increasing your AC temperature from 18 to 27 degrees can help you save around ₹ 6,240 in a year. Not only that, you also end up conserving 960kWh energy in a year (assuming your AC functions for eight months).

Annexure – 9

Kitchen Safety Awareness Training at Township House Hold



Annexure – 10

Cost of Environmental Protection Measures

Sr. No.	Activity	Cost incurred (INR in Lacs)			Budgeted Cost (INR in Lacs)
		2020 – 21	2021 – 22	2022 – 23 (till Sep'22)	2022 – 23
1.	Environmental Study / Audit and Consultancy	6.2	6.82	7.32	11.05
2.	Legal & Statutory Expenses	10.58	10.52	9.70	12
3.	Environmental Monitoring Services	19.17	14.31	6.37	33
4.	Hazardous / Non-Hazardous Waste Management & Disposal	83.55	107.09	72.35	127.72
5.	Environment Days Celebration and Advertisement / Business development	5.3	4.04	2.05	8.00
6.	Treatment and Disposal of Bio-Medical Waste	2.09	2.14	0.68	2.04
7.	Mangrove Plantation, Monitoring & Conservation	32.59	53.6	24.0	35.0
8.	Other Horticulture Expenses	689	921	490	913
9.	O&M of Sewage Treatment Plant and Effluent Treatment Plant (including STP, ETP of Port & SEZ & Common Effluent Treatment Plant)	148.49	252.27	77.36	196.63
10.	Expenditure of Environment Dept. (Apart from above head)	89.11	149.8	68.02	75.79
	Total	**1086.08**	**1371.79**	**757.85**	**1414.23**