

## Impact Assessment of 2 CSR Projects in 4 States



Submitted to

Indian Oil Corporation Limited  
Research & Development Centre Faridabad



Development & Research Services Pvt. Ltd (DRS)

A1/19, 1<sup>st</sup> Floor, Safdarjung Enclave, New Delhi -110029  
Ph.: 011-26161061, 26177413, 26163353, Telefax: 011-26172045  
Email: [info@drsindia.org](mailto:info@drsindia.org)



## Acknowledgments

The Indian Oil Corporation Ltd (IOCL) has made remarkable interventions under its Corporate Social Responsibility and we are grateful that we got the opportunity to assess the impact of 2 CSR projects undertaken by the esteemed company.

Our gratitude is also due to all IOCL project coordinating officers who provided valuable feedback and support to our team involved in the assessment of the Impact study.

Last but not the least we are also thankful to all beneficiaries/attendants who took out time to provide their feedback and perceptions on different subject of the Impact study.

The CSR Impact Assessment Team  
Development & Research Services Pvt. Ltd (DRS)  
New Delhi

### *Disclaimer-*

The study is an Impact study only and not the audit of the expenditure involved in the two projects.

## Table of Contents

<b>List of Tables</b>	<b>1-6</b>
<b>List of Abbreviations</b>	<b>8</b>
<b>Executive Summary</b>	<b>9-11</b>
<b>Chapter-1 Five TPD (Ton Per day) Biomethenation plant Project</b>	<b>12-17</b>
<b>Chapter-2 Procurement, Supply Installation, Testing and commissioning of 12 Medical grade oxygen generation units for Hospitals in MP, UP &amp; Odisha</b>	<b>18-18</b>
<b>Chapter-3 Shree Shiv Prasad Gupt (SSPG) Divisional District Hospital, Varanasi</b>	<b>19-24</b>
<b>Chapter-4 Netaji Subhash Chandra Bose District Hospital, Gorakhpur</b>	<b>25-30</b>
<b>Chapter-5 Balrampur District Hospital, Lucknow</b>	<b>31-36</b>
<b>Chapter-6 Lok Bandhu Raj Narayan Combined Hospital, Lucknow</b>	<b>37-42</b>
<b>Chapter-7 Dr Bhimrao Ambedkar District Hospital, Shajapur</b>	<b>43-47</b>
<b>Chapter-8 Bhoj District Hospital, Dhar</b>	<b>48-52</b>
<b>Chapter-9 District Hospital, Rajgarh</b>	<b>53-58</b>
<b>Chapter-10 District Vikash Multispecialty Hospital, Bargarh</b>	<b>59-64</b>
<b>Chapter-11 District Headquarters Hospital, Puri</b>	<b>65-70</b>
<b>Chapter-12 District Hospital, Sambalpur</b>	<b>71-76</b>
<b>Chapter-13 Sub Divisional Hospital, Angul</b>	<b>77-83</b>
<b>Gist of The CSR Impact Assessment - All Hospitals</b>	<b>84-87</b>
<b>Annexures</b>	<b>89-94</b>



Table	List of Tables	Page No.
Table.1	Is the respondent a beneficiary or he is an attendant	20
Table.2	Gender of Respondent	20
Table.3	Social Category	21
Table.4	Was the oxygen provided on time	21
Table.5	What was the reason for Hospitalization?	21
Table.6	What was the duration of Hospitalization? (In Days)	21
Table.7	Was Oxygen supply free or chargeable	21
Table.8	Did the Oxygen supply help patient recover from the Covid 19 or the patient yet succumbed to it?	22
Table.9	Do you think that the supply of oxygen was adequate	22
Table.10	Did you get the treatment as BPL category	22
Table.11	Overall Are you satisfied with the supply of the oxygen by the Hospital	22
Table.12	Is the respondent a beneficiary or he is an attendant	27
Table.13	Gender of Respondent	27
Table.14	Social Category	27
Table.15	Was the oxygen provided on time	27
Table.16	What was the duration of Hospitalization? (In days)	27
Table.17	Was Oxygen supply free or chargeable	28
Table.18	Did the Oxygen supply help patient recover from the Covid 19 or the patient yet succumbed to it?	28
Table.19	Do you think that the supply of oxygen was adequate	28
Table.20	Which documents can you show to verify that the patient was admitted to the Hospital for the Covid 19 treatment? (Admission slip)	28
Table.21	Which documents can you show to verify that the patient was admitted to the Hospital for the Covid 19 treatment? (Discharge slip)	29
Table.22	Did you get the treatment as BPL category	29
Table.23	If yes, Was the oxygen supply was free?	29
Table.24	Overall Are you satisfied with the supply of the oxygen by the Hospital	29
Table.25	Is the respondent a beneficiary or he is an attendant	32
Table.26	Gender of Respondent	32
Table.27	Social Category	33
Table.28	Was the oxygen provided on time	33
Table.29	What was the reason for Hospitalization?	33
Table.30	What was the duration of Hospitalization? (In Days)	33
Table.31	Was Oxygen supply free or chargeable	33
Table.32	Did the Oxygen supply help patient recover from the Covid 19 or the patient yet succumbed to it?	34
Table.33	Do you think that the supply of oxygen was adequate	34

Table	List of Tables	Page No.
Table.34	Which documents can you show to verify that the patient was admitted to the Hospital for the Covid 19 treatment? (Admission slip)	34
Table.35	Which documents can you show to verify that the patient was admitted to the Hospital for the Covid 19 treatment? (Discharge slip)	34
Table.36	Which documents can you show to verify that the patient was admitted to the Hospital for the Covid 19 treatment? (Medicine prescription of the Hospital)	35
Table.37	Which documents can you show to verify that the patient was admitted to the Hospital for the Covid 19 treatment? (Covid 19 report of the Hospital)	35
Table.38	Did you get the treatment as BPL category	35
Table.39	If yes, Was the oxygen supply was free?	35
Table.40	Overall Are you satisfied with the supply of the oxygen by the Hospital	35
Table.41	Is the respondent a beneficiary or he is an attendant	38
Table.42	Gender of Respondent	38
Table.43	Social Category	39
Table.44	Was the oxygen provided on time	39
Table.45	If No in Q 209 then ask about the delayed time	39
Table.46	What was the reason for Hospitalization?	39
Table.47	What was the duration of Hospitalization? (In Days)	39
Table.48	Was Oxygen supply free or chargeable	40
Table.49	Did the Oxygen supply help patient recover from the Covid 19 or the patient yet succumbed to it?	40
Table.50	Do you think that the supply of oxygen was adequate	40
Table.51	Which documents can you show to verify that the patient was admitted to the Hospital for the Covid 19 treatment? (Admission slip)	40
Table.52	Which documents can you show to verify that the patient was admitted to the Hospital for the Covid 19 treatment? (Discharge slip)	41
Table.53	Which documents can you show to verify that the patient was admitted to the Hospital for the Covid 19 treatment? (Medicine prescription of the Hospital)	41
Table.54	Did you get the treatment as BPL category	41
Table.55	If yes, Was the oxygen supply was free?	41
Table.56	Overall Are you satisfied with the supply of the oxygen by the Hospital	41
Table.57	Is the respondent a beneficiary or he is an attendant	44
Table.58	Gender of Respondent	44
Table.59	Social Category	44
Table.60	Was the oxygen provided on time	45
Table.61	What was the reason for Hospitalization?	45



Table	List of Tables	Page No.
Table.62	What was the duration of Hospitalization?	45
Table.63	Was Oxygen supply free or chargeable	45
Table.64	Did the Oxygen supply help patient recover from the Covid 19 or the patient yet succumbed to it?	45
Table.65	Do you think that the supply of oxygen was adequate	46
Table.66	Which documents can you show to verify that the patient was admitted to the Hospital for the Covid 19 treatment? (Admission slip)	46
Table.67	Which documents can you show to verify that the patient was admitted to the Hospital for the Covid 19 treatment? (Discharge slip)	46
Table.68	Which documents can you show to verify that the patient was admitted to the Hospital for the Covid 19 treatment? (Medicine prescription of the Hospital)	46
Table.69	Overall Are you satisfied with the supply of the oxygen by the Hospital	46
Table.70	Is the respondent a beneficiary or he is an attendant	49
Table.71	Gender of Respondent	50
Table.72	Social Category	50
Table.73	Was the oxygen provided on time	50
Table.74	What was the reason for Hospitalization?	50
Table.75	What was the duration of Hospitalization? (In Days)	50
Table.76	Was Oxygen supply free or chargeable	50
Table.77	Did the Oxygen supply help patient recover from the Covid 19 or the patient or they yet succumbed to it?	51
Table.78	Do you think that the supply of oxygen was adequate	51
Table.79	Which documents can you show to verify that the patient was admitted to the Hospital for the Covid 19 treatment? (Admission slip)	51
Table.80	Which documents can you show to verify that the patient was admitted to the Hospital for the Covid 19 treatment? (Discharge slip)	51
Table.81	Which documents can you show to verify that the patient was admitted to the Hospital for the Covid 19 treatment? (Medicine prescription of the Hospital)	51
Table.82	Did you get the treatment as BPL category	52
Table.83	Overall Are you satisfied with the supply of the oxygen by the Hospital	52
Table.84	Is the respondent a beneficiary or he is an attendant	55
Table.85	Gender of Respondent	55
Table.86	Social Category	55
Table.87	Was the oxygen provided on time	55
Table.88	What was the reason for Hospitalization?	55
Table.89	What was the duration of Hospitalization?	55
Table.90	Was Oxygen supply free or chargeable	56



Table	List of Tables	Page No.
Table.91	Did the Oxygen supply help patient recover from the Covid 19 or the patient yet succumbed to it?	56
Table.92	Do you think that the supply of oxygen was adequate	56
Table.93	Which documents can you show to verify that the patient was admitted to the Hospital for the Covid 19 treatment? (Admission slip)	56
Table.94	Which documents can you show to verify that the patient was admitted to the Hospital for the Covid 19 treatment? (Discharge slip)	56
Table.95	Which documents can you show to verify that the patient was admitted to the Hospital for the Covid 19 treatment? (Medicine prescription of the Hospital)	57
Table.96	Which documents can you show to verify that the patient was admitted to the Hospital for the Covid 19 treatment? (Covid 19 report of the Hospital)	57
Table.97	Which documents can you show to verify that the patient was admitted to the Hospital for the Covid 19 treatment? (Nothing is available)	57
Table.98	Did you get the treatment as BPL category	57
Table.99	Overall Are you satisfied with the supply of the oxygen by the Hospital	57
Table.100	Is the respondent a beneficiary or he is an attendant	61
Table.101	Gender of Respondent	61
Table.102	Social Category	61
Table.103	Was the oxygen provided on time	61
Table.104	What was the reason for Hospitalization?	61
Table.105	What was the duration of Hospitalization? (In days)	62
Table.106	Was Oxygen supply free or chargeable	62
Table.107	Did the Oxygen supply help patient recover from the Covid 19 or the patient yet succumbed to it?	62
Table.108	do you think that the supply of oxygen was adequate	62
Table.109	Which documents can you show to verify that the patient was admitted to the Hospital for the Covid 19 treatment? (Admission slip)	63
Table.110	Which documents can you show to verify that the patient was admitted to the Hospital for the Covid 19 treatment? (Discharge slip)	63
Table.111	Which documents can you show to verify that the patient was admitted to the Hospital for the Covid 19 treatment? (Medicine prescription of the Hospital)	63
Table.112	Which documents can you show to verify that the patient was admitted to the Hospital for the Covid 19 treatment? (Covid 19 report of the Hospital)	63
Table.113	Overall Are you satisfied with the supply of the oxygen by the Hospital	63



Table	List of Tables	Page No.
Table.114	Is the respondent a beneficiary or he is an attendant	66
Table.115	Gender of Respondent	67
Table.116	Social Category	67
Table.117	Was the oxygen provided on time	67
Table.118	What was the reason for Hospitalization?	67
Table.119	What was the duration of Hospitalization?	67
Table.120	Was Oxygen supply free or chargeable	67
Table.121	Did the Oxygen supply help patient recover from the Covid 19 or the patient yet succumbed to it?	68
Table.122	Do you think that the supply of oxygen was adequate	68
Table.123	Which documents can you show to verify that the patient was admitted to the Hospital for the Covid 19 treatment? (Admission slip)	68
Table.124	Which documents can you show to verify that the patient was admitted to the Hospital for the Covid 19 treatment? (Discharge slip)	68
Table.125	Which documents can you show to verify that the patient was admitted to the Hospital for the Covid 19 treatment? (Medicine prescription of the Hospital)	69
Table.126	Which documents can you show to verify that the patient was admitted to the Hospital for the Covid 19 treatment? (Covid 19 report of the Hospital)	69
Table.127	Did you get the treatment as BPL category	69
Table.128	If yes, Was the oxygen supply was free?	69
Table.129	Overall Are you satisfied with the supply of the oxygen by the Hospital	69
Table.130	Is the respondent a beneficiary or he is an attendant	73
Table.131	Gender of Respondent	73
Table.132	Social Category	73
Table.133	Was the oxygen provided on time	73
Table.134	What was the reason for Hospitalization?	73
Table.135	What was the duration of Hospitalization? (In Days)	73
Table.136	Was Oxygen supply free or chargeable	74
Table.137	Did the Oxygen supply help patient recover from the Covid 19 or the patient yet succumbed to it?	74
Table.138	Do you think that the supply of oxygen was adequate	74
Table.139	Which documents can you show to verify that the patient was admitted to the Hospital for the Covid 19 treatment? (Admission slip)	74
Table.140	Which documents can you show to verify that the patient was admitted to the Hospital for the Covid 19 treatment? (Discharge slip)	75
Table.141	Which documents can you show to verify that the patient was admitted to the Hospital for the Covid 19 treatment? (Medicine prescription of the Hospital)	75



Table	List of Tables	Page No.
Table.142	Which documents can you show to verify that the patient was admitted to the Hospital for the Covid 19 treatment? (Covid 19 report of the Hospital)	75
Table.143	Did you get the treatment as BPL category	75
Table.144	If yes, Was the oxygen supply was free?	75
Table.145	Overall Are you satisfied with the supply of the oxygen by the Hospital	76
Table.146	Is the respondent a beneficiary or he is an attendant	78
Table.147	Gender of Respondent	79
Table.148	Social Category	79
Table.149	Was the oxygen provided on time	79
Table.150	What was the reason for Hospitalization?	79
Table.151	What was the duration of Hospitalization? (In Days)	79
Table.152	Was Oxygen supply free or chargeable	79
Table.153	Did the Oxygen supply help patient recover from the Covid 19 or the patient yet succumbed to it?	80
Table.154	Do you think that the supply of oxygen was adequate	80
Table.155	Which documents can you show to verify that the patient was admitted to the Hospital for the Covid 19 treatment? (Admission slip)	80
Table.156	Which documents can you show to verify that the patient was admitted to the Hospital for the Covid 19 treatment? (Discharge slip)	80
Table.157	Which documents can you show to verify that the patient was admitted to the Hospital for the Covid 19 treatment? (Medicine prescription of the Hospital)	81
Table.158	Which documents can you show to verify that the patient was admitted to the Hospital for the Covid 19 treatment? (Covid 19 report of the Hospital)	81
Table.159	Did you get the treatment as BPL category	81
Table.160	Overall Are you satisfied with the supply of the oxygen by the Hospital	81



Chart	List of Charts	Page No.
Chart 1	Is the respondent a beneficiary or he is an attendant (In %)	101
Chart 2	Gender of Respondent	101
Chart 3	Social Category	102
Chart 4	Was the oxygen provided on time	102
Chart 5	What was the reason for hospitalization?	103
Chart 6	What was the duration of Hospitalization (In Days)?	103
Chart 7	Was Oxygen supply free or chargeable	104
Chart 8	Did the Oxygen supply help patient recover from the Covid 19 or the patient yet succumbed to it?	104
Chart 9	Do you think that the supply of oxygen was adequate	105
Chart 10	Which documents can you show to verify that the patient was admitted to the hospital for the Covid 19 treatment? (Yes In %)	105
Chart 11	Did you get the treatment as BPL category	106
Chart 12	Overall Are you satisfied with the supply of the oxygen by the Hospital	106

## List of Abbreviations

AOV	AOV International
BGW	Bulk Waste Generators
BPL	Below Poverty Line
CBG	Compressed Bio Gas
CMO	Chief Medical Officer
CSR	Corporate Social Responsibility
IOCL	Indian Oil Corporation Ltd
JJ	Jhuggi Jhopri
LMO	Liquid Medical Oxygen
LPM	Liter Per Minute
MCF	Municipal Corporation Faridabad
O&M	Operation and Management
PLC	Programme Logic Controller
PSA	Pressure Swing Adsorption
R&D	Research and Development
TPD	Ton Per Day
TP	Trident Pneumatics
SC	Scheduled Caste

## Executive Summary

The R&D wing of Indian Oil Corporation Limited (IOCL) is credited with numerous initiatives connected with health, family welfare, education, environment protection, sanitation, empowerment of women and other marginalized groups.

Two such projects, related to Health sanitation and environment were implemented by IOCL and the same came up for evaluation to assess and evaluate the direct and indirect impacts created across beneficiaries and stakeholder groups. The main objective of this Impact assessment exercise is to evaluate the benefits accrued to the beneficiaries over the period of implementation.

The First project, a 5 Ton Per Day capacity Bio-methanation gas plant was installed by IOCL (R&D) in the district of Faridabad of the Haryana state with an objective to mitigate or control the environment pollution in line with the guidelines of Swachh Bharat Mission (SBM) by way of providing bio-gas mainly for the preparation of mid day meal for students. Under the project Municipal Corporation of Faridabad (MCF) was obligated to supply the waste for the operational purposes of the plant having collected it from the households of the Faridabad. The second project has been Procurement, Supply and Installation of 12 Oxygen gas plants to 11 Hospitals spread across three states, namely Uttar Pradesh, Madhya Pradesh and Odhisa.

### STUDY METHODOLOGY

The study methodology involved desk review, data collection and its analysis, In-depth interview, FGDs, and reporting. It was conducted simultaneously for the two projects. The two projects were quite different from each other. Interaction with beneficiaries was at the centre of the Field work, supported by in-depth interviews with doctors, officials and personnel involved with O&M (Operation and Management). Beneficiaries of PSA oxygen plants (Project 2) were traced out and they or their attendants were interviewed to capture their perception about the impact of the intervention.

### DATA ANALYSIS

The data collected through both primary and secondary sources were tabulated for further uses and interpretations. They provided insight into understanding the level and the intensity of the impacts of the projects in different spheres and also finding the way forward. The qualitative feedback collected was matched with data collected through primary sources to arrive at definitive findings.



## (OUTPUTS) KEY FINDINGS

### Project -1

#### 5 Ton per Day capacity Bio-Methanation gas Plant

The 5 ton biogas plant started with a huge success and it kept supplying gas to ISKCON foundation kitchen for preparation of mid day school.

ISKCON foundation kitchen received gas and the same was used in preparing of mid day meal for a considerable time since its inception.

Discussions with RWA/Residents revealed that the Faridabad residents have adopted environment friendly methods of garbage collection and disposal of which was found to be in line with the guidelines of Swachh Bharat Mission (Urban). This environment-friendly practice has been consistent with government increasing emphasis on the better environment and pollution reduction policies and also intervention like intervention such as installation of bio-methanation gas plant.

### Project -2

#### Installation of Pressure Swing Adsorption (PSA) Oxygen Plants

A total number of 12 Medical Pressure Swing Adsorption (PSA) oxygen plants were installed in 11 hospitals of 10 districts, spread across three states, namely, Uttar Pradesh, Madhya Pradesh and Odisha.

This intervention was an exemplary success keeping in view a number of lives were saved across the CSR intervention areas. The CSR intervention came after the first wave of the COVID, yet many precious lives were saved during following waves of Covid times.

Most of them recovered after getting oxygen from the Hospitals and were thankful to the IOCL for the efforts when they came to know through the study team that a PSA oxygen plant has come up to leverage the supply system of oxygen in Hospitals.

Operation and Maintenance (O&M) has been the responsibility of the Hospitals. The plant is automatic and does not need much support for its operation and all plants were found properly manned for its smooth operation.

All PSA Plants were operational and were in use as per the requirement at the time of the visit. Doctors resort to use of Liquid Medical Oxygen (LMO) tanks and cylinders when there was power cuts or when the demand was low.

Doctors across all Hospital expressed fulsome praise for such IOCL novel CSR initiatives. One of the doctors said that during the second wave of COVID pandemic India produced more than 7000 metric tons of liquid oxygen but due to problems in supply chain and other issues India needed to generate more of oxygen and in this light this CSR intervention of installation of PSA plants stood out.

Doctors said that the state governments have extended necessary support in arranging the AMCs for such plants. Doctors suggested that the maintenance of the plant should find exclusive mention in the AMC contract to avoid confusion even at the cost of some extra premium.

Some Hospitals were heavily dependent on this plant. They find it easier as they say that oxygen from LMO tanks evaporates after some time where as you can use it as per your convenience and there is no loss of oxygen since no storage is required.



## Chapter -1

### 1. Five TPD (Ton Per day) Biomethanation plant Project

#### 1.1 Project details

Faridabad is generating about 700 tons per day waste; out of which about 10% is organic waste (70 tons per day from Vegetable Mandi, kitchen waste, etc.) and the balance is inorganic waste.

The R&D of IOCL in deference to the guidelines of SBM which gave emphasis to renewable energy for domestic use for a cleaner environment conceived of installation of a 5 TPD Bio-methanation Plant, based on in-house technology. The same was commissioned in March'2019 in collaboration with Municipal Corporation of Faridabad (MCF) and had been operated and maintained for 3 years (i.e. for FY 2019-20, 2020-21 & 2021-22) by Indian Oil R&D Centre through vendor who is supplying and installing the main plant equipments. The gas thus produced is to be bottled and provided to ISKCON kitchen in sector 7 for mid-day meal of government school children.



The R&D centre of IOCL developed in-house bio methanation technology for efficient conversion of various organic wastes such as food waste, kitchen waste, biomass residue, etc. to biogas. The technology includes microbial consortium which can convert food or kitchen waste into raw biogas in a two stage process. With this technology a biomethanation plant capable of processing 5 TPD of kitchen/food waste to produce compressed bio gas (CBG) was set up in Faridabad under CSR initiative, as part of Swachh Bharat Abhiyan in collaboration with Municipal Corporation of Faridabad. This PLC (Programmable Logic controller (PLC) operated plant includes the feed preparation, pre digester, main digester gas balloon, gas purification compression system and purified gas storing cascades.



The CBG produced from the plant after purification is supplied to ISKCON for preparing mid-day meal for school children, free of cost under CSR initiative.

A brief description of the designed process flow scheme is as under:

Segregated food /kitchen waste is fed into the shredder in which waste is converted to homogenized waste slurry by adding required quantity of water.

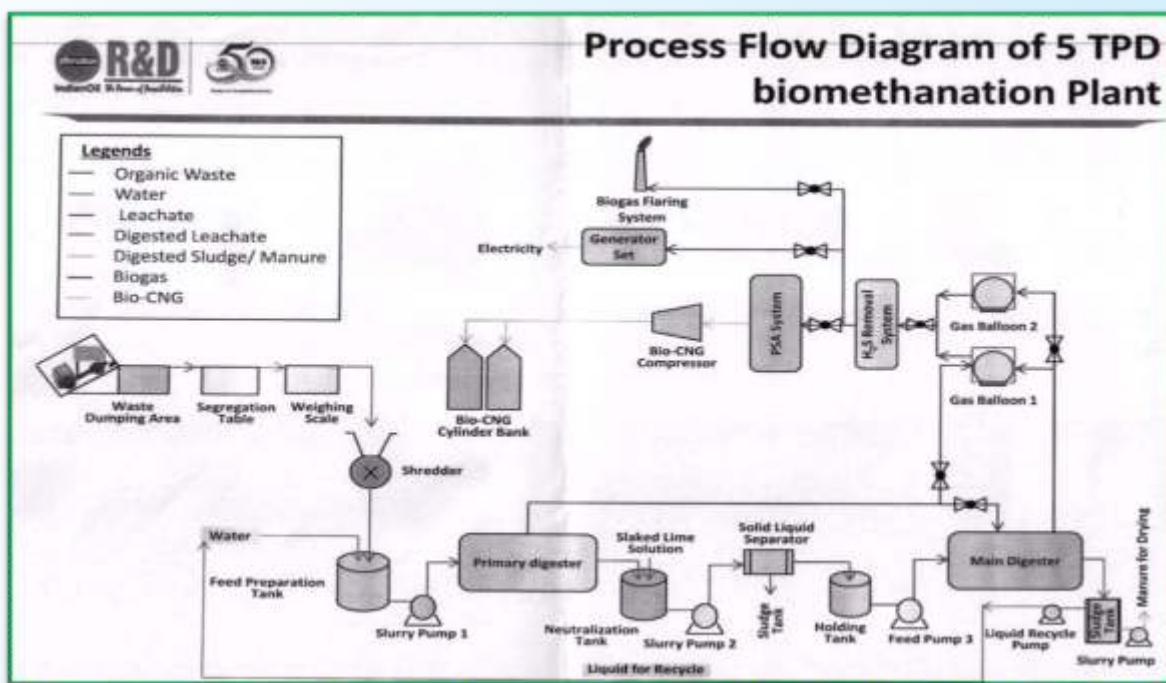
Homogenized waste slurry is collected in the feed preparation tank from which it is pumped into the pre-digester

In the pre-digester biodegradable organic fractions present in the waste slurry are converted into volatile fatty acids (VFAs).

Waste slurry leaving the pre-digester is neutralized in the neutralization tank and neutralized waste slurry is taken to the solid liquid separator to separate liquid leachate from the solid fractions.

Liquid leachate is continuously pumped into the main digester in which methanogenic microbial inoculums converts volatile fatty acids (VFAs) into biogas with high methane content.

Generated biogas is stored in the biogas balloons and raw biogas is subject to PSA based biogas up-gradation system for generation of biogas with 96% methane content purified biogas is compressed and stored in the CBG cylinder cascades. (Ref Diagram given below)



As informed by R&D Centre the plant was commissioned almost 5 years back (2019) but was running under capacity because of unavailability of desired feed quantity and quality. In view of this, R&D Centre lined up a party for ensuring consistent supply of food/kitchen waste to operate the plant in full capacity to assess the performance of the plant.

The waste is fed in batches of around 150 kgs and water and the feeding time being approx 30 minutes. For 5 ton waste it would take almost around 6-8 hours to feed into digester.

## 1.2 Objectives of the Project are as follows:

- 1.2.1 To assess whether the disposal of Organic waste is disposed off in an environment friendly manner.
- 1.2.2. To assess whether productive disposal of Domestic wet kitchen waste is as per the guidelines of GoI's initiative on Swachh Bharat Abhiyan.
- 1.2.3. To assess whether conversion of organic waste into biogas and bio- manure is happening or not and the same is being utilized for other purposes as originally envisaged
- 1.2.4 Whether the Gas thus generated from the organic waste is being utilized by ISKCON kitchen for preparation of Mid- day meal in schools
- 1.2.5. Whether or not the generated Bio-manure is being utilized for increasing soil fertility.

## 2. Methodology and Approach

The prescription of the ToR (Terms of Reference) that all the stakeholders like residents of Faridabad (Practice followed in garbage disposal), ISCKON Kitchen operators and mid-day schools which receive gas-cooked foods are critical contributors to the evaluation exercise as stakeholders. The study approach therefore mainly revolves households of Faridabad, Key functionaries in ISKCON kitchen operations institutions and farmers involved in enhancing soil fertility.

The study team interacted with the IOCL coordinating team, Key functionaries of Plant and its operator and Municipal Corporation of Faridabad officials and such interactions would help finalize the research using the information/inputs thus provided.

The stakeholders identified as respondents for the evaluation study are listed specifically in matrix provided below. The study will use a wide range of quantitative and qualitative research approaches and tools, including desk research on available secondary data to undertake the proposed impact assessment. Usage of research approaches and tools for specific respondent categories is detailed in the following table:

Research Approach/Tool	Respondent Category Covered
Desk Research on Secondary data	<ul style="list-style-type: none"> <li>Background information from R&amp;D of Indian Oil CompanyLtd</li> <li>Literature on production and distribution of Bio methenation Gas and its efficacy</li> </ul>
Qualitative Methods Structured / Semi- structured Questionnaires	<ul style="list-style-type: none"> <li>Beneficiary (Faridabad residents) households</li> <li>Key Functionaries ISKCON Kitchen and others)</li> </ul>
in-depth/perceptual information	<ul style="list-style-type: none"> <li>Functionaries involved in production of biomethane and its distribution</li> <li>Select program beneficiaries</li> </ul>
Qualitative notes	<ul style="list-style-type: none"> <li>Based on discussions with various stakeholders and observations at the district level</li> </ul>

### 3. Evaluation Findings

#### 3.1 Disposal of Organic waste

Interactions with beneficiaries across wards revealed that the disposal of waste is done in an environment friendly manner. Most of the societies were equipped with separate arrangements of the solid and liquid waste disposals. Good frequency of garbage pick-up by Municipal vehicles was also reported by the Municipal functionaries and the same was corroborated by the residents across the wards.

The study team also interacted with inhabitants of JJ (Jhuggi Jhopri) clusters and the feedback reflected that there has been remarkable improvement in adopting disposal of organic waste as per the guidelines of SBM. The emphasis of the Central government on the cleaner environment has paid desired results.

The practice of vermicomposting among Farmers left little for the MCF for organic waste collection. The study team through FGDs among farmers found out that vermicomposting has been used by them for better fertilization. It found more impetus as government supported it.

#### 3.2 Conversion of Organic waste into Bio Gas

In the beginning a little less than 5 ton waste (4.8) was processed to produce bio gas having 82 percent methane. Quantity of waste and water being fed to the digester of the plant could have been measured better. It almost took around 6 to 8 hrs to feed approx 5 ton waste if the twin shredders were used.

#### 3.3 The Municipal Corporation Faridabad perspective

The MCF process around 150 TPD of fresh waste at decentralized locations. It was supposed to provide only 5 ton to the BM plant to help it keep running. As per the guidelines of SBM any entity producing more than 100 kgs waste per day is a bulk producing generators of waste.

The urban local bodies are still struggling to map all BWGs. More than 70 BWGs were penalized in Faridabad for not adhering to the guidelines of SBM. In the MCF perspective it was difficult to supply 5TPD waste free of cost as most of these collected wastes go to land filling and other non-recyclable activity.

#### 4. The Road Ahead

The TRI-PARTITE Agreement involving IOCL, MCF and Ecogreen Energy Pvt. Ltd was signed on 23rd April 2018 for five years.

The plant can surely produce to its full capacity provided 5 ton waste are supplied by the MCF. The fact that MCF has more than 275 BWGs shows that the MCF did not take the obligation of providing the 5TPD waste free of cost seriously.

It is, therefore, suggested that there should be a provision of payment for the waste to be supplied to the plant to help meet the transportation cost and other miscellaneous expenses.

In the new guidelines of SBM (U) the central has given more emphasis to the management of Bulk Waste Generators and it is likely that the situation of proper collection of waste would improve with time. As per MCF land filling is major activity where most of the wastes get consumed.

The Plant can run at its full capacity if the MCF makes some serious efforts about providing the waste for the plant.

#### Way Forward

Since the plant is still operational and holds high prospects of sustainability if the supply of waste is met; the agreement with the MCF should be redrafted making it obligatory for the Corporation to supply the waste for the bio gas generation.

The MCF should manage the transportation of waste and find ways to make it possible. The IOCL R&D has done an exemplary work by providing this plant for the production of Bio Methanation gas.

Once, it starts operating with its full capacity more staff would be required to handle the operation effectively.



## Chapter -2

### 2 Procurement, Supply Installation, Testing and commissioning of 12 Medicalgrade oxygen generation units for Hospitals in MP, UP & Odisha

#### 2.1 About the Project

At the time when individuals, families, communities, and societies across the country were suffering under the 2nd wave of COVID19, there was shortage of Medical Grade Oxygen in many Hospitals.

With shortage in Oxygen supplies being flagged across the country, as a socially responsible organization and to ensure the availability of Medical Graded Oxygen, IndianOil R&D Centre installed 12 units of 960 LPM of PSA based medical grade oxygen generation systems in various Hospitals with an estimated Expenditure of Rs. 11.54 Crores under CSR initiatives.

As the supply was meant for the Hospitals the likely beneficiaries were resident of Varanasi, Lucknow & Gorakhpur Districts of Uttar Pradesh, residents of Shajapur, Rajgarh & Dhar Districts of Madhya Pradesh and resident of Bargarh, Angul & Sambalpur Districts of Odisha.

#### 2.2 Methodology and Approach

The study team used beneficiary schedule for patients who availed of oxygen supply. They were located far and wide and therefore it was with some serious efforts that the beneficiary names were obtained from the Hospitals. The list was at some places not available in a proper manner and at times it was not possible to dig out those who were supplied oxygen by the plant. In some Hospital they showed the register and the survey team had to note it down from the register for doing the interview. In some Hospitals there were multiple sources for the supply of oxygen and it was difficult to identify for the Hospitals too to ascertain which plant supplied the oxygen to the patients.

Also most patients had little idea about how they were treated in Hospital with special reference to the supply of oxygen to them the survey team contacted the attendants for the feedback about the oxygen supply at Hospitals. The oxygen was supplied to each ward of the Hospitals

In-depth interview with Key functionaries/operators involved in providing Oxygen to such patients helped understand the operational problems and its long term sustainability. They also provided insight into positives or negatives of other methods of Oxygen supply.

## Chapter -3

### 3.1 Shree Shiv Prasad Gupt (SSPG) Divisional District Hospital, Varanasi, Uttar Pradesh

#### A. General Information

The PSA Oxygen Plant in SSPG district Hospital, Varanasi was installed and commissioned in June 2021 at a cost of Rs 94,40,440. The plant has been operational and supplying oxygen ever since. On the day of the visit it was also found operational and in use and supplying Oxygen whenever needed.

The contract for installation was given to a company namely Trident Pneumatics (TP) a company that installed PSA type oxygen generator plant in the Hospitals across the selected districts of the state.



#### B. OPERATION AND MAINTENANCE

The warranty was for one year and therefore for the first year it was maintained by the company. After the first year the Hospital maintained it for some time and then the state government tied up with Cyrix health care Pvt Ltd for Annual Maintenance Contract (AMC) and currently it is being maintained by the same.

For its smooth operation one person was deputed. Since the plant is fully automatic it hardly needs any assistance in its operation. It is only required to monitor the purity and flow of the oxygen generated. The plant automatically trips if the purity goes down the desired level.

### C. Output

The capacity of the plant was 960 LPM. The purity is 94-95. The Hospital provides oxygen to 60 to 65 patients on a normal day. But during the critical days of Covid it treated 120- 130 patients each day.



### 3.2 The Beneficiary perspective

The patients/attendants who were contacted and interviewed said that they had seamless supply of the oxygen during their stay in the Hospitals. All of them said that they received the supply of oxygen without any difficulty and felt much better after getting it.

Patients were accompanied by attendants who took care of the patient and thus were in a better position to observe and notice the treatments given by the doctors. The study team thus interacted with attendants and patients both or who so ever was available to give the feedback

City Name	Hospital Name	Table.1: Is the respondent a beneficiary or he is an attendant					
		Beneficiary		Beneficiary's Attendant		Overall	
		Count	%	Count	%	Count	%
VARANASI	SHRI SHIV PRASADGUPT DIVISIONAL DISTRICT HOSPITAL	1	20%	4	80%	5	100%

Three fourth of the beneficiaries contacted were attendant. Only in one case the patient himself answered it.

City Name	Hospital Name	Table.2: Gender of Respondent							
		Male		Female		Other		Total	
		Count	%	Count	%	Count	%	Count	%
VARANASI	SHRI SHIV PRASAD GUPT DIVISIONAL DISTRICT HOSPITAL	5	100%	0	0%	0	0%	5	100%

All the beneficiaries feedback was collected were male.

City Name	Hospital Name	Table.3: Social Category							
		Gen		OBC		SC/ST		Total	
		Count	%	Count	%	Count	%	Count	%
VARANASI	SHRI SHIV PRASAD GUPT DIVISIONAL DISTRICT HOSPITAL	3	60%	2	40%	0	0%	5	100%

Three of the patients were from general category whereas the remaining two from OBC.

City Name	Hospital Name	Table.4: Was the oxygen provided on time							
		Yes		No		Total			
		Count	%	Count	%	Count	%	Count	%
VARANASI	SHRI SHIV PRASADGUPT DIVISIONAL DISTRICT HOSPITAL	5	100%	0	0%	5	100%		

All beneficiaries who were given oxygen received it on time.

City Name	Hospital Name	Table.5: What was the reason for Hospitalization?							
		Covid 19 infected		Other diseases		Total			
		Count	%	Count	%	Count	%	Count	%
VARANASI	SHRI SHIV PRASADGUPT DIVISIONAL DISTRICT HOSPITAL	5	100%	0	0%	5	100%		

All beneficiaries who were contacted were Covid 19 victims.

City Name	Hospital Name	Table.6: What was the duration of Hospitalization? (In Days)									
		1d		3d		7d		20d		Total	
		Count	%	No	%	No	%	No	%	No	%
VARANASI	SHRI SHIV PRASADGUPT DIVISIONAL DISTRICT HOSPITAL	2	40%	1	20%	1	20%	1	20%	5	100%

One in five patients had to stay for more than a week in the Hospital.

City Name	Hospital Name	Table.7: Was Oxygen supply free or chargeable							
		Free		Chargeable		Don't remember/Can't Say		Total	
		Count	%	No	%	No	%	No	%
VARANASI	SHRI SHIV PRASADGUPT DIVISIONAL DISTRICT HOSPITAL	5	100%	0	0%	0	0%	5	100%

That the oxygen supply was free affirmed by all the patients interviewed in the survey.

City Name	Hospital Name	Table.8: Did the Oxygen supply help patient recover from the Covid 19 or the patient yet succumbed to it?							
		Yes patient recovered from Covid 19		No the patient succumbed to it		Patient was provided oxygen for some other disease		Total	
		Count	%	Count	%	Count	%	Count	%
VARANASI	SHRI SHIV PRASAD GUPT DIVISIONAL DISTRICT HOSPITAL	3	60%	2	40%	0	0%	5	100%

Two respondents said that their patients did not survive even after the oxygen was given but added that they had died earlier had the oxygen supply was not there.

City Name	Hospital Name	Table.9: Do you think that the supply of oxygen was adequate							
		Yes, Adequate		Not Adequate		Can't Say		Total	
		Count	%	Count	%	Count	%	Count	%
VARANASI	SHRI SHIV PRASAD GUPT DIVISIONAL DISTRICT HOSPITAL	3	60%	0	0%	2	40%	5	100%

When asked about their perception about the adequacy of the oxygen in the Hospital 60% of them said that it was adequate whereas 40% had no idea about this.

City Name	Hospital Name	Table.10: Did you get the treatment as BPL category					
		Yes		No		Total	
		Count	%	Count	%	Count	%
VARANASI	SHRI SHIV PRASADGUPT DIVISIONAL DISTRICT HOSPITAL	4	80%	1	20%	5	100%

One of the beneficiaries who received oxygen supply was not in BPL category.

City Name	Hospital Name	Table.11: Overall Are you satisfied with the supply of the oxygen by the Hospital							
		Satisfied		Not Satisfied		Can't Say			
		Count	%	Count	%	Count	%		
VARANASI	SHRI SHIV PRASADGUPT DIVISIONAL DISTRICT HOSPITAL	4	80%	1	20%	0	0%	5	100%

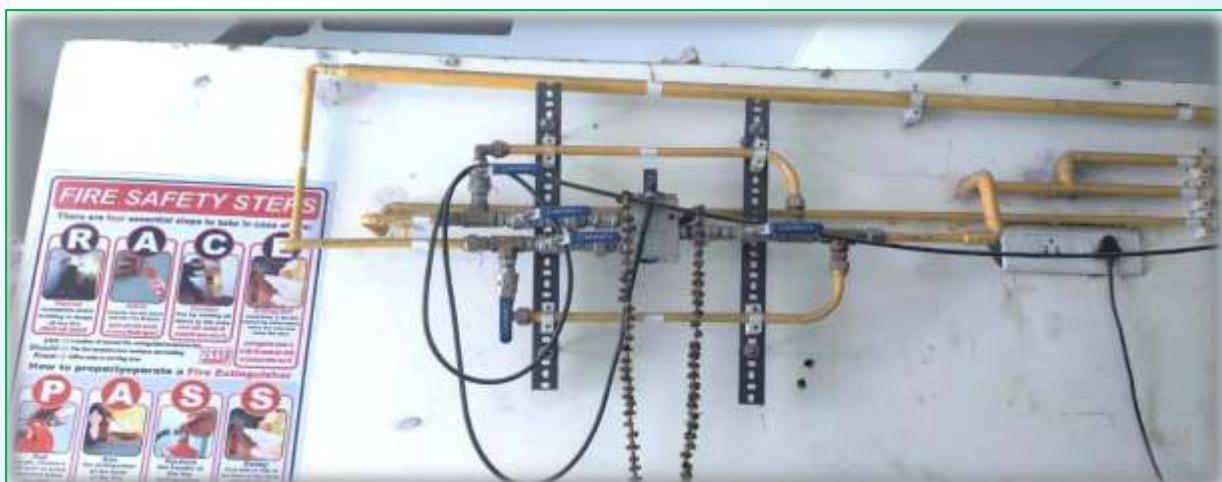
Four out of the five patients/attendants were happy about the supply of oxygen in the Hospital.

### 3.3 The Doctor's Perspective

The doctors also said that even on a normal day the plant is sufficient to meet the requirement and only occasionally they have to use LMO tanks when the demand gets high. The PSA Oxygen has been a big help and during Covid time this saved many lives. It was difficult to ascertain that how much it catered to Covid patients or the other disease patients as in Covid times it was a big rush of patients.

Earlier they had to depend on the LMO but now they have alternatives like plants provided by IOCL. The doctors were quite appreciative of the CSR intervention as it saved the lives of many Covid victims.

#### OXYGEN PIPE LINE



## OXYGEN PLANT COMPONENTS



## Chapter -4

### 4.1 Netaji Subhash Chandra Bose District Hospital, Gorakhpur, Uttar Pradesh



#### A. General Information

One PSA Plant (GO 960 model) was installed in Netaji Subhash Chandra Bose district Hospital, Gorakhpur and got commissioned in July 2021 at a cost of Rs 94,40,000. The same was handed over to NSCB Hospital in August 2021. The plant has been operational and supplying oxygen ever since. On the day of the visit it was also found operational and in use too.

When installation was done the oxygen pressure was given as 4.7 bars and oxygen purity was 94.50%. The manufacturing company in its warranty had assured that the purity would vary between 90% and 96%.

The contract for installation was given to a company namely Trident Pneumatics (TP) a company that installed PSA type oxygen generator plant in the Hospitals across the selected districts of the state.

#### B. OPERATION AND MAINTENANCE

During the warranty period of one year the plant was maintained by the manufacturing company and subsequently it was to be maintained by the Hospital. The state government tied up with Cyrix health care Pvt Ltd for Annual Maintenance Contract (AMC) and currently it is being maintained by the same.

When the study team visited it found that the plant was operational with its capacity and having the needed purity of oxygen.

One person is deployed for its operation. The plant is fully automatic and there is not much effort required in having to maintain it. The operator said he is happy operating it as he only has to check purity and flow of the oxygen generated. There is a provision in the plant that it would trip automatically if the purity goes down the desired level.



### **C. Output**

The given capacity of the plant is reported as 960 LPM. The purity at the time of visit is 94- 95 which can only be disrupted when a power cut is there. Doctors said that if the power cut is frequent then they shift to LMO tanks. The Hospital provides oxygen to 60 to 65 patients on a normal day. However, During Covid time around 100 to 125 patients were reportedly given oxygen per day.

#### **4.2 The Beneficiary perspective**

It was important to find out what beneficiaries thought about the supply of oxygen to them. Though the oxygen was supplied primarily to Covid patients a large number of other diseases patients also got benefitted. Beneficiaries were interviewed to capture the perception about efficacy of the oxygen supply during their stay in the Hospitals. Some of the attendants of the beneficiaries said that constant supply was not there but they managed to get it during Covid time. The patients of Covid days did not wish to recall the time and it took some efforts to take feedback from them. Except for the Covid time when the plant was not sufficient to meet the demand it was of good support for the normal time patients.

Since mostly it was not the patient but the attendant who observed and noticed and availed of the facilities or requirements at the Hospital the study team interacted with attendants of beneficiaries/patients too.

City Name	Hospital Name	Table.12: Is the respondent a beneficiary or he is an attendant					
		Beneficiary		Beneficiary' Attendant		Overall	
		Count	%	No	%	No	%
GORAKHPUR	DISTRICT HOSPITAL GORAKHPUR	0	0%	5	100%	5	100%

All the interviewed were attendants of the patients who were given oxygen in the Hospital.

City Name	Hospital Name	Table.13: Gender of Respondent							
		Male		Female		Other			
		Count	%	No	%	No	%		
GORAKHPUR	DISTRICT HOSPITAL GORAKHPUR	3	60%	2	40%	0	0%	5	100%

60% of the respondents were male and 40% were female.

City Name	Hospital Name	Table.14: Social Category							
		Gen		OBC		SC/ST			
		Count	%	No	%	No	%		
GORAKHPUR	DISTRICT HOSPITAL GORAKHPUR	1	20%	4	80%	0	0%	5	100%

20% of the respondents were of general category whereas the remaining were from OBC.

City Name	Hospital Name	Table.15: Was the oxygen provided on time					
		Yes		No		Total	
		Count	%	Count	%	Count	%
GORAKHPUR	DISTRICT HOSPITAL GORAKHPUR	5	100%	0	0%	5	100%

All five patients said that the oxygen was provided on time where as one respondent said that he was notsure what time it took to get the oxygen. However, one of them said that he was told by the doctor that itwas immediately provided. He himself was unsure of time taken.

City Name	Hospital Name	Table.16: What was the duration of Hospitalization? (In days)									
		1d		2d		3d		5d			
		Count	%	Count	%	Count	%	Count	%		
GORAKHPUR	DISTRICT HOSPITAL GORAKHPUR	1	20%	1	20%	2	40%	1	20%	5	100%

Most of them got discharged in 1 to 3 days but one got discharged in 5 days.

City Name	Hospital Name	Table.17: Was Oxygen supply free or chargeable							
		Free		Chargeable		Don't remember/Can't Say		Total	
		Count	%	Count	%	Count	%	Count	%
GORAKHPUR	DISTRICT HOSPITAL GORAKHPUR	4	80%	0	0%	1	20%	5	100%

The oxygen supply was all free as 4 out of five respondents said the same. One respondent said he is notsure about the same.

City Name	Hospital Name	Table.18: Did the Oxygen supply help patient recover from the Covid 19 or the patient yet succumbed to it?							
		Yes patient recovered from Covid 19		No the patient succumbed to it		Patient was provided oxygen for some other disease		Total	
		Count	%	No	%	Count	%	No	%
GORAKHPUR	DISTRICT HOSPITAL GORAKHPUR	2	40%	0	0%	3	60%	5	100%

Two of the respondents said that their patients survived but the other three got treated for other ailments.

City Name	Hospital Name	Table.19: Do you think that the supply of oxygen was adequate							
		Yes Adequate		Not Adequate		Can't Say		Total	
		Count	%	Count	%	Count	%	Count	%
GORAKHPUR	DISTRICT HOSPITAL GORAKHPUR	4	80%	0	0%	1	20%	5	100%

4 out of 5 respondents found the supply was adequate where as one felt otherwise. When we probed deeper he revealed that he was not sure whether oxygen was adequate or not.

City Name	Hospital Name	Table.20: Which documents can you show to verify that the patient was admitted to the Hospital for the Covid 19 treatment? (Admission slip)							
		Yes		No		Document Seen		Total	
		Count	%	Count	%	Count	%	Count	%
GORAKHPUR	DISTRICT HOSPITAL GORAKHPUR	5	100%	0	0%	0	0%	5	100%

The respondents said they do have the admission slip but presently not with them. The team could not see them

City Name	Hospital Name	Table.21: Which documents can you show to verify that the patient was discharged from the Hospital for the Covid 19 treatment? (Discharge slip)							
		Yes		No		Document Seen		Total	
		Count	%	Count	%	Count	%	Count	%
GORAKHPUR	DISTRICT HOSPITAL GORAKHPUR	5	100%	0	0%	0	0%	5	100%

All of them said they have discharge slip too and can show when given time to search it out.

City Name	Hospital Name	Table.22: Did you get the treatment as BPL category					
		Yes		No		Total	
		Count	%	Count	%	Count	%
GORAKHPUR	DISTRICT HOSPITAL GORAKHPUR	4	80%	1	20%	5	100%

80% of them were from BPL category; who were given oxygen.

City Name	Hospital Name	Table.23: If yes, Was the oxygen supply was free?					
		Yes		No		Total	
		Count	%	Count	%	Count	%
GORAKHPUR	DISTRICT HOSPITAL GORAKHPUR	4	100%	1	10%	5	100%

Four out of five said that the oxygen supply was free where as one said that had to spend for oxygen.

City Name	Hospital Name	Table.24: Overall Are you satisfied with the supply of the oxygen by the Hospital							
		Satisfied		Not Satisfied		Can't say		Total	
		Count	%	Count	%	Count	%	Count	%
GORAKHPUR	DISTRICT HOSPITAL GORAKHPUR	4	80%	0	0%	1	20%	5	100%

When asked are you overall satisfied with the supply of the oxygen four respondents said yes they were satisfied with the supply of the oxygen however one of them was not too sure about this.

#### 4.3 The Doctor's Perspective

The doctors said that the plant has been quite helpful in meeting the requirement of the Hospital and they feel confident and relax if a Plant unit is also available for the supply of the oxygen. During Covid time many lives were saved due to the oxygen supply of this plant. He recounted some interesting stories about saving life of the patients but failed to recall the name or any other details of the patient.

The doctors said that the plant has been a big support but at times has to resort to LMO tanks when power cut is there. The purity of the oxygen has been desirable and many patients benefitted from it. He said that some patients recovered quickly and some took a few days to recover. One doctor said that at the time of Covid the plant was new and functioned seamlessly and saved many precious lives.

**DR. RAJENDRA KUMAR GIVING HIS FEEDBACK**



## Chapter -5

### 5.1 Balrampur District Hospital, Lucknow, Uttar Pradesh

#### A. General Information

The Plant (GO 960 model) in Balrampur Hospital was installed and commissioned on 26 July 2021 at a cost of Rs 94,40,000 and the same was handed over to NSCB Hospital in August 2021. The plant has been operational and supplying oxygen ever since. On the day of the visit it was also found operational. The Hospital is solely dependent on it other than resorting to oxygen cylinders.

At the time of installation of PSA plant, it was reported that oxygen purity was 93.50%. The expected oxygen purity is 90 to 96% as per Trident Pneumatics.



The contract for installation was given to a company namely Trident Pneumatics (TP) a company that installed PSA type oxygen generator plant in the Hospitals across the selected districts of the state.

#### B. OPERATION AND MAINTENANCE

This plant had a warranty of one year and subsequently it had to be maintained by the Hospital. The state government felt a need to have an AMC for all medical equipments and tied up with Cyrix health care Pvt Ltd for Annual Maintenance Contract (AMC). The Plant is currently maintained by the same.

It was reported running smoothly since its installation. The operator didn't face any problems in its operation. He said that during Power cuts he takes help of LMO tanks and whenever demand is low they prefer to service the plant.

The plant is fully automatic and one has to do very little to monitor its operation. It is only required to monitor the purity and flow of the oxygen generated. The plant automatically trips if the purity goes down the desired level.

### C. Output

The capacity of the plant was 960 LPM (Litres per Minute). The purity at the time of installation was 94-95 and subsequently during operations it was around the same. Normally the Hospital treats 70-80 patients each day but during Covid time around 140 to 150 patients were given oxygen per day including Covid patients. The pressure of the oxygen supply keeps around 4.5 bars.

#### 5.2 The Beneficiary perspective

Some of the beneficiaries were contacted and interviewed to capture the perception about the overall impact of oxygen supply during their stay in the Hospitals; they managed to get it during Covid time. The patients of Covid days did not wish to recall the time and it took some efforts to take feedback from them. Except for the Covid time when the plant was not sufficient to meet the demand it was of a good support for the normal time patients.

The study team interacted with attendants and patients both, as per availability. It also observed that only a few patients were able to recall the time and treatment they received from the Hospitals. They therefore interacted with both patients and their attendants.

The study team inspected installation and operation of Plant and found that the same was done in August 2021 and handed over to the Hospital. The study team interacted with many beneficiaries and were successful in interviewing 7 of them.

City Name	Hospital Name	Table.25: Is the respondent a beneficiary or he is an attendant					
		Beneficiary		Attendant		Overall	
		Count	%	Count	%	Count	%
LUCKNOW	BALRAMPUR DISTRICT HOSPITAL LUCKNOW	0	0%	7	100%	7	100%

All the respondents were beneficiaries' attendants. Two patients were also available but could not give any feedback.

City Name	Hospital Name	Table.26: Gender of Respondent							
		Male		Female		Other		Total	
		Count	%	Count	%	Count	%	Count	%
LUCKNOW	BALRAMPUR DISTRICT HOSPITAL LUCKNOW	6	86%	1	14%	0	0%	7	100%

Six of them were male and one female.

City Name	Hospital Name	Table.27: Social Category							
		Gen		OBC		SC/ST		Total	
		Count	%	Count	%	Count	%	Count	%
LUCKNOW	BALRAMPUR DISTRICT HOSPITAL LUCKNOW	4	57%	1	14%	2	29%	7	100%

4 Out of 7 patients were from general category and the others from OBC or SCs.

City Name	Hospital Name	Table.28: Was the oxygen provided on time							
		Yes		No		Total			
		Count	%	Count	%	Count	%	Count	%
LUCKNOW	BALRAMPUR DISTRICT HOSPITAL LUCKNOW	7	100%	0	0%	7	100%		

All respondents affirmed that the oxygen was provided on time.

City Name	Hospital Name	Table.29: What was the reason for Hospitalization?							
		Covid 19 infected		Other diseases		Total			
		Count	%	Count	%	Count	%	Count	%
LUCKNOW	BALRAMPUR DISTRICT HOSPITAL LUCKNOW	3	43%	4	57%	7	100%		

Three of them were Covid victims and this shows that the oxygen was given for other critical diseases too and in a way more likely to give a clearer picture on the ease of availability and supply of the oxygen.

City Name	Hospital Name	Table.30: What was the duration of Hospitalization? (In Days)											
		1d		3d		5d		6d		12d			
		Count	%	Count	%	Count	%	Count	%	Count	%		
LUCKNOW	BALRAMPUR DISTRICT HOSPITAL LUCKNOW	2	29%	1	14%	1	14%	2	29%	1	14%	7	100%

The Hospitalization, as per the 7 respondents, varied from one day to 12 days. Two were hospitalized for just 1 day whereas 1 got hospitalized for 14 days.

City Name	Hospital Name	Table.31: Was Oxygen supply free or chargeable							
		Free		Chargeable		Don't remember/Can't Say		Total	
		Count	%	Count	%	Count	%	Count	%
LUCKNOW	BALRAMPUR DISTRICT HOSPITAL LUCKNOW	7	100%	0	0%	0	0%	7	100%

All 7 respondents reported that the oxygen supply was free.

City Name	Hospital Name	Table.32: Did the Oxygen supply help patient recover from the Covid 19 or the patient yet succumbed to it?							
		Yes patient recovered from Covid 19		No the patient succumbed to it		Patient was provided oxygen for some other disease		Total	
		Count	%	Count	%	Count	%	Count	%
LUCKNOW	BALRAMPUR DISTRICT HOSPITAL LUCKNOW	3	43%	0	0%	4	57%	7	100%

All three Covid patients recovered from Covid and 4 got oxygen for some other diseases.

City Name	Hospital Name	Table.33: Do you think that the supply of oxygen was adequate							
		Yes Adequate		Not Adequate		Can't Say		Total	
		Count	%	Count	%	Count	%	Count	%
LUCKNOW	BALRAMPUR DISTRICT HOSPITAL LUCKNOW	7	100%	0	0%	0	0%	7	100%

All seven respondents reported that the supply was adequate.

City Name	Hospital Name	Table.34: Which documents can you show to verify that the patient was admitted to the Hospital for the Covid 19 treatment? (Admission slip)							
		Yes		No		Doc. Seen		Total	
		Count	%	Count	%	Count	%	Count	%
LUCKNOW	BALRAMPUR DISTRICT HOSPITAL LUCKNOW	5	71%	2	29%	0	0%	7	100%

All five respondents said that they had the admission slip but expressed their inability in having to tracethem out.

City Name	Hospital Name	Table.35: Which documents can you show to verify that the patient was admitted to the Hospital for the Covid 19 treatment? (Discharge slip)							
		Yes		No		Doc. Seen		Total	
		Count	%	Count	%	Count	%	Count	%
LUCKNOW	BALRAMPUR DISTRICT HOSPITAL LUCKNOW	6	86%	1	14%	0	0%	7	100%

Six of the respondents said that they could show the discharge slip but none of them could actually showthem.

City Name	Hospital Name	Table.36: Which documents can you show to verify that the patient was admitted to the Hospital for the Covid 19 treatment? (Medicine prescription of the Hospital)							
		Yes		No		Document Seen		Total	
		Count	%	Count	%	Count	%	Count	%
LUCKNOW	BALRAMPUR DISTRICT HOSPITAL LUCKNOW	4	57%	3	43%	0	0%	7	100%

Four out of 7 respondents said that they have the medicines prescriptions to show that they were Covid patients but could not furnish to the study teams.

City Name	Hospital Name	Table.37: Which documents can you show to verify that the patient was admitted to the Hospital for the Covid 19 treatment? (Covid 19 report of the Hospital)							
		Yes		No		Document Seen		Total	
		Count	%	Count	%	Count	%	Count	%
LUCKNOW	BALRAMPUR DISTRICT HOSPITAL LUCKNOW	3	0%	4	100%	0	0%	7	100%

All three Covid patients said that they had the diagnostic reports of having been admitted as Covid infected patients.

City Name	Hospital Name	Table.38: Did you get the treatment as BPL category					
		Yes		No		Total	
		Count	%	Count	%	Count	%
LUCKNOW	BALRAMPUR DISTRICT HOSPITAL LUCKNOW	6	86%	1	14%	7	100%

Six of the beneficiaries were from BPL category.

City Name	Hospital Name	Table.39: If yes, Was the oxygen supply was free?					
		Yes		No		Total	
		Count	%	Count	%	Count	%
LUCKNOW	BALRAMPUR DISTRICT HOSPITAL LUCKNOW	6	100%	0	0%	6	100%

Six of the respondents said that the oxygen supply was free while one didn't said anything.

City Name	Hospital Name	Table.40: Overall Are you satisfied with the supply of the oxygen by the Hospital					
		Satisfied		Not Satisfied		Can't Say	
		Count	%	Count	%	Count	%
LUCKNOW	BALRAMPUR DISTRICT HOSPITAL LUCKNOW	6	86%	0	0%	1	14%

Six out of seven respondents said that they were satisfied with the supply of the oxygen. This speaks of the success of the oxygen plants intervention which helped the Hospital to meet the demand even in the critical time. One could not remember anything.

### 5.3 The Doctor's Perspective

The doctors said that they didn't face any problem on normal day and one plant is sufficient to meet the requirement. They said that during Covid time it was of much help in having to keep up with the demand of the oxygen. The doctors/technician said that the plant is automatic and automatically adjusts the pressure and flow when the demand is high. During Covid time many lives were saved due to the oxygen supply of this plant. Since the source of supply remains the same it is difficult to ascertain that how much it catered to Covid patients or the other disease' patients. In this study the patients who were contacted had received oxygen for other diseases and were benefitted by that.

The doctors suggested that the plant has been a big help but its maintenance has been an issue. They wanted onsite maintenance facility to avoid the time lag in the rectification of the problems.



## Chapter -6

### 6.1 Lok Bandhu Raj Narayan Combined Hospital, Lucknow, Uttar Pradesh



#### **A General information**

The Plant (GO 960 model) in Lok Bandhu Raj Narayan Hospital near Kanpur road district Lucknow was installed and commissioned in September 2021 at a cost of Rs 94,40,000 and the same was handed over to NSCB Hospital in October 2021.

The study team was told that at the time of PSA plant installation the pressure was 4.7 bar and oxygen purity of 94.50%. The expected oxygen purity is 90 to 96% as per Trident Pneumatics.

The PSA type Oxygen generator was installed by a company namely Trident Pneumatics (TP) a company that installed PSA type oxygen generator plant in the Hospitals across the selected districts of the state.

#### **B OPERATION AND MAINTENANCE**

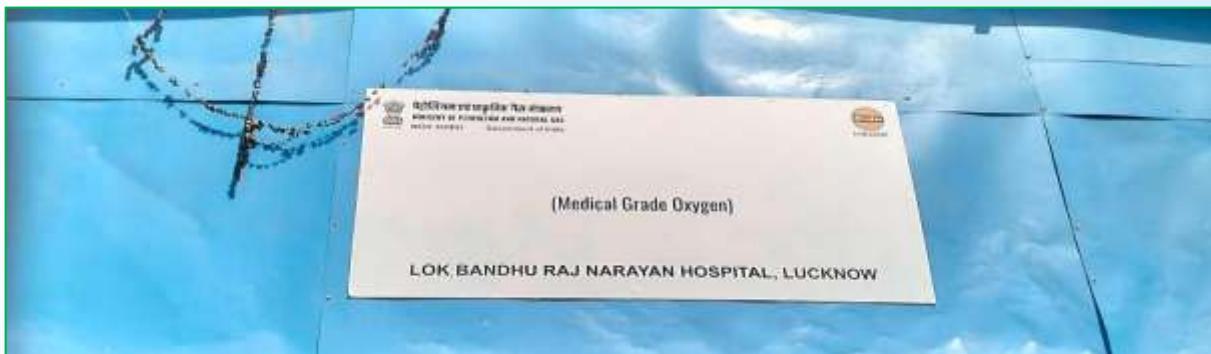
This plant was under the warranty of one year and subsequently it was to be maintained by the Hospital. The Hospital has lined up AMC with Avalon Power Pvt Ltd for its maintenance.

One person is deployed for its operation. Since the plant is fully automatic it hardly needs any assistance in its operation. It is only required to monitor the purity and flow of the oxygen generated. The plant automatically trips if the purity goes down the desired level.



## C Output

The capacity of the plant was 960 LPM. The purity at the time of visit is 94-95 but at times it dips to below 90 which creates problem. On a normal day it supplied oxygen to 35 to 55 patients. But during Covid time around 90 to 110 patients were given oxygen per day.



## 6.2 The Beneficiary perspective

Beneficiaries were interviewed to capture the perception about efficacy of the oxygen supply during their stay in the Hospitals. Some of the attendants said that during Covid time the oxygen supply was of much help to them. There was scarcity of the oxygen in private Hospitals and the supply of oxygen is free here. The patients of Covid days got disturbed when they recalled the Covid time and it took some efforts to take feedback from them. Except for the Covid time when the plant was not sufficient to meet the demand it was of good support for the normal time patients.

Since mostly it was not the patient but the attendant who observed and noticed it the study team interacted with attendants and patients both.

City Name	Hospital Name	Table.41: Is the respondent a beneficiary or he is an attendant					
		Beneficiary		Attendant		Overall	
		Count	%	Count	%	Count	%
LUCKNOW	LOK BANDHU RAJ NARAYAN COMBINED HOSPITAL	0	0%	5	100%	5	100%

All five respondents were the attendants of the patient.

City Name	Hospital Name	Table.42: Gender of Respondent							
		Male		Female		Other		Total	
		Count	%	Count	%	Count	%	Count	%
LUCKNOW	LOK BANDHU RAJ NARAYAN COMBINED HOSPITAL	4	80%	1	20%	0	0%	5	100%

Out of five respondents one was female.

City Name	Hospital Name	Table.43: Social Category							
		Gen		OBC		SC/ST		Total	
		Count	%	Count	%	Count	%	Count	%
LUCKNOW	LOK BANDHU RAJ NARAYAN COMBINED HOSPITAL	4	80%	1	20%	0	0%	5	100%

Four patients come from general category and from Social category.

City Name	Hospital Name	Table.44: Was the oxygen provided on time							
		Yes		No		Total			
		Count	%	Count	%	Count	%	Count	%
LUCKNOW	LOK BANDHU RAJ NARAYAN COMBINED HOSPITAL	4	80%	1	20%	5	100%		

All five respondents reported to have received oxygen on time. This also underlines that the plant despitessome hindrances did contribute to meeting the exigent demand.

City Name	Hospital Name	Table.45: If No in Q 209 then ask about the delayed time							
		One day		Two days		More than two days		Total	
		Count	%	Count	%	Count	%	Count	%
LUCKNOW	LOK BANDHU RAJ NARAYAN COMBINED HOSPITAL	1	100%	0	0%	0	0%	1	100%

The one respondent who said it was not given on time got it within a few hours.

City Name	Hospital Name	Table.46: What was the reason for Hospitalization?							
		Covid 19 infected		Other diseases		Total			
		Yes	%	Yes	%	Count	%	Count	%
LUCKNOW	LOK BANDHU RAJ NARAYAN COMBINED HOSPITAL	1	20%	4	80%	5	100%		

Only one patient was hospitalized due to Covid and the other 4 got hospitalized for some other diseases.

City Name	Hospital Name	Table.47: What was the duration of Hospitalization? (In Days)									
		1d		3d		4d		7d		Total	
		Yes	%	Yes	%	Yes	%	Yes	%	Yes	%
LUCKNOW	LOK BANDHU RAJ NARAYAN COMBINED HOSPITAL	2	40%	1	20%	1	20%	1	20%	5	100%

Four beneficiaries got hospitalized for 1 to 4 days. One was hospitalized for 7 days.

City Name	Hospital Name	Table.48: Was Oxygen supply free or chargeable							
		Free		Chargeable		Don't remember/Can't Say		Total	
		Yes	%	Yes	%	Yes	%	Count	%
LUCKNOW	LOK BANDHU RAJ NARAYAN COMBINED HOSPITAL	5	100%	0	0%	0	0%	5	100%

All five respondents reported that the supply was free. It definitely was in line with the objective of this CSR initiative in the critical time for the IOCL(R&D).

City Name	Hospital Name	Table.49: Did the Oxygen supply help patient recover from the Covid 19 or the patient yet succumbed to it?							
		Yes patient recovered from Covid 19		No the patient succumbed to it		Patient was provided oxygen for some other disease		Total	
		Yes	%	No	%	No	%	Count	%
LUCKNOW	LOK BANDHU RAJ NARAYAN COMBINED HOSPITAL	0	0%	1	20%	4	80%	5	100%

One out of four of the patients did not survive despite getting Oxygen on time. The Covid patient did not survive. He was doubtful of the adequacy of oxygen supply in the Hospital.

City Name	Hospital Name	Table.50: Do you think that the supply of oxygen was adequate							
		Yes Adequate		Not Adequate		Can't Say		Total	
		Count	%	Count	%	Count	%	Count	%
LUCKNOW	LOK BANDHU RAJ NARAYAN COMBINED HOSPITAL	4	80%	0	0%	1	20%	5	100%

Four out of five respondents said that the supply of the oxygen was adequate to the best of their knowledge but one felt that it could have been better as his patient has died in the Hospital and he suspected a lack of supply of the oxygen.

City Name	Hospital Name	Table.51: Which documents can you show to verify that the patient was admitted to the Hospital for the Covid 19 treatment? (Admission slip)							
		Yes		No		Doc. Seen		Total	
		Count	%	Count	%	Count	%	Count	%
LUCKNOW	LOK BANDHU RAJ NARAYAN COMBINED HOSPITAL	4	80%	1	20%	0	0%	5	100%

Four out of five patients had the admission slip.

City Name	Hospital Name	Table.52: Which documents can you show to verify that the patient was admitted to the Hospital for the Covid 19 treatment? (Discharge slip)							
		Yes		No		Doc. Seen		Total	
		Count	%	Count	%	Count	%	Count	%
LUCKNOW	LOK BANDHU RAJ NARAYAN COMBINED HOSPITAL	4	80%	1	20%	0	0%	5	100%

Four out of five patients had the discharge slip too.

City Name	Hospital Name	Table.53: Which documents can you show to verify that the patient was admitted to the Hospital for the Covid 19 treatment? (Medicine prescription of the Hospital)							
		Yes		No		Doc. Seen		Total	
		Count	%	Count	%	Count	%	Count	%
LUCKNOW	LOK BANDHU RAJ NARAYAN COMBINED HOSPITAL	5	100%	0	0%	0	0%	5	100%

All five had medicines prescriptions too.

City Name	Hospital Name	Table.54: Did you get the treatment as BPL category					
		Yes		No		Total	
		Count	%	Count	%	Count	%
LUCKNOW	LOK BANDHU RAJ NARAYAN COMBINED HOSPITAL	4	80%	1	20%	5	100%

Four out of five patients belong to BPL category BPL

City Name	Hospital Name	Table.55: If yes, Was the oxygen supply was free?					
		Yes		No		Total	
		Count	%	Count	%	Count	%
LUCKNOW	LOK BANDHU RAJ NARAYAN COMBINED HOSPITAL	4	100%	0	0%	4	100%

All BPL category patients got the oxygen all free.

City Name	Hospital Name	Table.56: Overall Are you satisfied with the supply of the oxygen by the Hospital							
		Satisfied		Not Satisfied		Can't Say		Total	
		Count	%	Count	%	Count	%	Count	%
LUCKNOW	LOK BANDHU RAJ NARAYAN COMBINED HOSPITAL	1	20%	4	80%	0	0%	5	100%

### 6.3 The Doctor's Perspective

The doctors said that the plant has been operational and has been quite a valuable support in providing oxygen to patients. Some time back, due to repeated shutdown of this plant they had to face problems. But now they feel confident and relax with the PSA oxygen supply available to them. They mentioned of Covid times without any prompting as many lives were saved with the supply of oxygen supply of this plant. They also said that not only Covid patients got oxygen but also the patients of other diseases benefitted from it.

The doctors suggested that the plant has been a big help and the Hospital is doing everything possible to maintain it properly despite some hindrances. They were overall happy with this timely intervention of PSA oxygen supply during Covid times. Many of them said that it was quite commendable and such efforts under CSR must get due recognition. Some of them lamented that the patients who got this supply did not know where from the Oxygen is being provided to.



## Chapter -7

### 7.1 Dr Bhimrao Ambedkar District Hospital, Shajapur, Madhya Pradesh

#### A. General Information



The Plant (GO 960 model) in Ambedkar Hospital, Shajapur, was installed and commissioned on 16 September 2021 at a cost of Rs 94,40,000 and the same was handed over to Hospital on the same day. The plant has been operational and supplying oxygen ever since. The Hospital is banking solely on this plant for the supply of oxygen. They have the other source like oxygen cylinders but this plant meets all requirements and hence the other source is seldom used. It was installed by Trident Pneumatics.

At the time of installation PSA plant installation was 4.6 bar and oxygen purity of 93%. The expected oxygen purity is 90 to 96% as per Trident Pneumatics.

The contract for maintenance after the warranty was given to a company namely AOV International a company that manufactures and maintain the medical equipments.

#### B OPERATION AND MAINTENANCE

After completion of one year warranty from the company, the plant is maintained by the Hospital. The state government tied up with AOV international for Annual Maintenance Contract (AMC) and currently it is being maintained by the same.

Trident Pneumatic is also obligated to maintain it but since they know that the state government has given this tender of maintenance to AOV International they have stopped addressing complaints with regard to this plant. This plant has been operational ever since it was installed and has been supplying oxygen to patients nearly uninterrupted.



The purity of oxygen has hovered around 90 and therefore it never shut down. Interactions with technicians who operate it revealed that they seldom resort to two other methods of oxygen supply that is LMO and Oxygen cylinders. Only in case of interrupted power supply they have to resort to LMO and Oxygen cylinders as they do not need electricity to run it.

One person is deployed for its operation. Since the plant is fully automatic it hardly needs any assistance in its operation. It is only required to monitor the purity and flow of the oxygen generated. The plant automatically trips if the purity goes down the desired level.

## B. Output

The capacity of the plant was 960 LPM. The purity at the time of visit is 90-95 which is quite a good purity for giving oxygen. Only during Power cuts the plant abruptly shuts down and the patient is shifted to LMO tanks supply. It provides oxygen to 60 to 65 patients on a normal day. But during Covid time around 100 to 125 patients were given oxygen per day.

### 7.2 The Beneficiary perspective

Beneficiaries were interviewed to capture the perception about efficacy of the oxygen supply during their stay in the Hospitals. Some of the attendants of Patients said that constant supply was not there but they managed to get it during Covid time. Even during Covid time the plant sufficiently handled unimaginable surge in the demand of oxygen.

City Name	Hospital Name	Table.57: Is the respondent a beneficiary or he is an attendant					
		Beneficiary		Attendant		Overall	
		Count	%	Count	%	Count	%
SHAJAPUR	DISTRICT HOSPITAL SHAJAPUR	9	90%	1	10%	10	100%

Nine of the 10 respondents were the patients themselves and one was the patient's attendant.

City Name	Hospital Name	Table.58: Gender of Respondent							
		Male		Female		Other		Total	
		Count	%	Count	%	Count	%	Count	%
SHAJAPUR	DISTRICT HOSPITAL SHAJAPUR	8	80%	2	20%	0	0%	10	100%

80% of them were male where as 20% were female.

City Name	Hospital Name	Table.59: Social Category							
		Gen		OBC		SC/ST		Total	
		Count	%	Count	%	Count	%	Count	%
SHAJAPUR	DISTRICT HOSPITAL SHAJAPUR	2	20%	5	50%	3	30%	10	100%

Two were of the general category, 5 from OBC and three were SC/ST.

City Name	Hospital Name	Table.60: Was the oxygen provided on time					
		Yes		No		Total	
		Count	%	Count	%	Count	%
SHAJAPUR	DISTRICT HOSPITAL SHAJAPUR	10	100%	0	0%	10	100%

All the respondents said that the oxygen was provided on time.

City Name	Hospital Name	Table.61: What was the reason for Hospitalization?					
		Covid 19 infected		Other diseases		Total	
		Count	%	Count	%	Count	%
SHAJAPUR	DISTRICT HOSPITAL SHAJAPUR	4	40%	6	60%	10	100%

Four of them were hospitalized for the Covid reason and the rest got admitted for different other ailments.

City Name	Hospital Name	Table.62: What was the duration of Hospitalization?					
		1		Total			
		Count	%	Count	%	Count	%
SHAJAPUR	DISTRICT HOSPITAL SHAJAPUR	10	100%	10	100%	10	100%

They all got Hospitalized for a single day.

City Name	Hospital Name	Table.63: Was Oxygen supply free or chargeable							
		Free		Chargeable		Don't remember/Can't Say		Total	
		Count	%	Count	%	No	%	No	%
SHAJAPUR	DISTRICT HOSPITAL SHAJAPUR	10	100%	0	0%	0	0%	10	100%

All respondents said that they had got the oxygen all free.

City Name	Hospital Name	Table.64: Did the Oxygen supply help patient recover from the Covid 19 or the patient yet succumbed to it?							
		Yes patient recovered from Covid 19		No the patient succumbed to it		Patient was provided oxygen for some other disease		Total	
		Count	%	Count	%	Count	%	Count	%
SHAJAPUR	DISTRICT HOSPITAL SHAJAPUR	4	40%	0	0%	6	60%	10	100%

Six of the patients had got treated for some other diseases and no death was reported from the respondents.

City Name	Hospital Name	Table.65: Do you think that the supply of oxygen was adequate							
		Yes Adequate		No, Adequate		Can't Say		Total	
		Count	%	Count	%	Count	%	Count	%
SHAJAPUR	DISTRICT HOSPITAL SHAJAPUR	8	80%	0	0%	2	20%	10	100%

Out of 10 respondents 8 said that supply of oxygen was adequate where as 2 of them were not sure about the adequacy of the supply and said that they had no idea.

City Name	Hospital Name	Table.66: Which documents can you show to verify that the patient was admitted to the Hospital for the Covid 19 treatment? (Admission slip)							
		Yes		No		Doc. Seen		Total	
		No	%	No	%	No	%	No	%
SHAJAPUR	DISTRICT HOSPITAL SHAJAPUR	4	40%	5	50%	1	10%	10	100%

Four of the admission claimed to have the admission slip where as five did not have with them but only one could show it.

City Name	Hospital Name	Table.67: Which documents can you show to verify that the patient was admitted to the Hospital for the Covid 19 treatment? (Discharge slip)							
		Yes		No		Doc. Seen		Total	
		No	%	No	%	No	%	No	%
SHAJAPUR	DISTRICT HOSPITAL SHAJAPUR	4	40%	6	60%	0	0%	10	100%

Four claimed to have discharge slip but none could show it to the interviewer.

City Name	Hospital Name	Table.68: Which documents can you show to verify that the patient was admitted to the Hospital for the Covid 19 treatment? (Medicine prescription of the Hospital)							
		Yes		No		Doc. Seen		Total	
		Count	%	Count	%	Count	%	Count	%
SHAJAPUR	DISTRICT HOSPITAL SHAJAPUR	10	100%	0	0%	0	0%	10	100%

All claimed to be having medical prescriptions but none of them was able to trace that out.

City Name	Hospital Name	Table.69: Overall Are you satisfied with the supply of the oxygen by the Hospital							
		Satisfied		Not Satisfied		Can't Say		Total	
		Yes	%	No	%	Yes	%	Count	%
SHAJAPUR	DISTRICT HOSPITAL SHAJAPUR	10	100%	0	0%	0	0%	10	100%

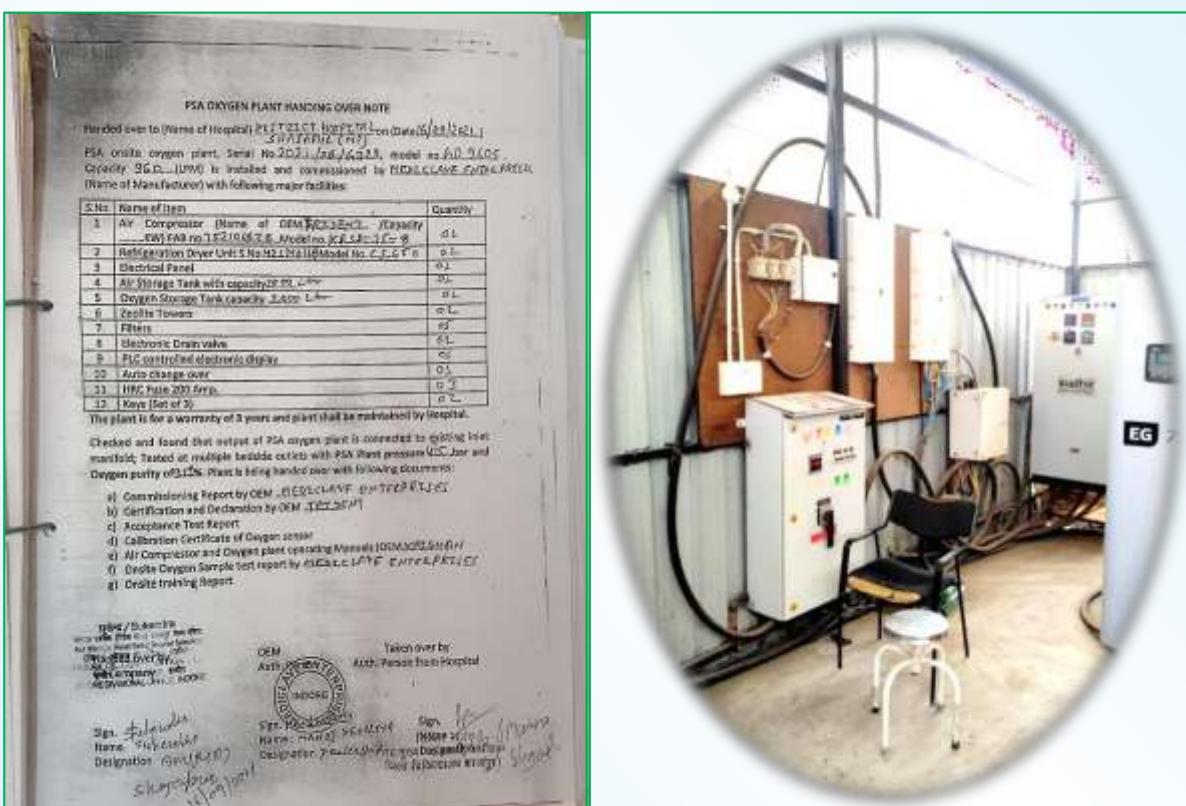


## 7.3 The Doctor's Perspective

The doctors said that during Covid time many lives were saved due to the oxygen supply of this plant. It was difficult to ascertain that how much it catered to Covid patients or the other disease patients. They said that this plant kept running continuously since its installation and was never out of operation. They profusely appreciated the CSR initiative by IOCL as they felt that precious lives would have been lost had this initiative not been taken.

Doctors said that the PSA Plant is automatic and hardly requires much effort in its operation. They related all stories about patients getting timely help of oxygen supply during critical days of Covid pandemic.

The doctors suggested that the plant has been a big help and were quite appreciative of the efforts made by IOCL during Covid time. One of the doctors said that other corporate houses should also undertake more CSR activities in the health sector.





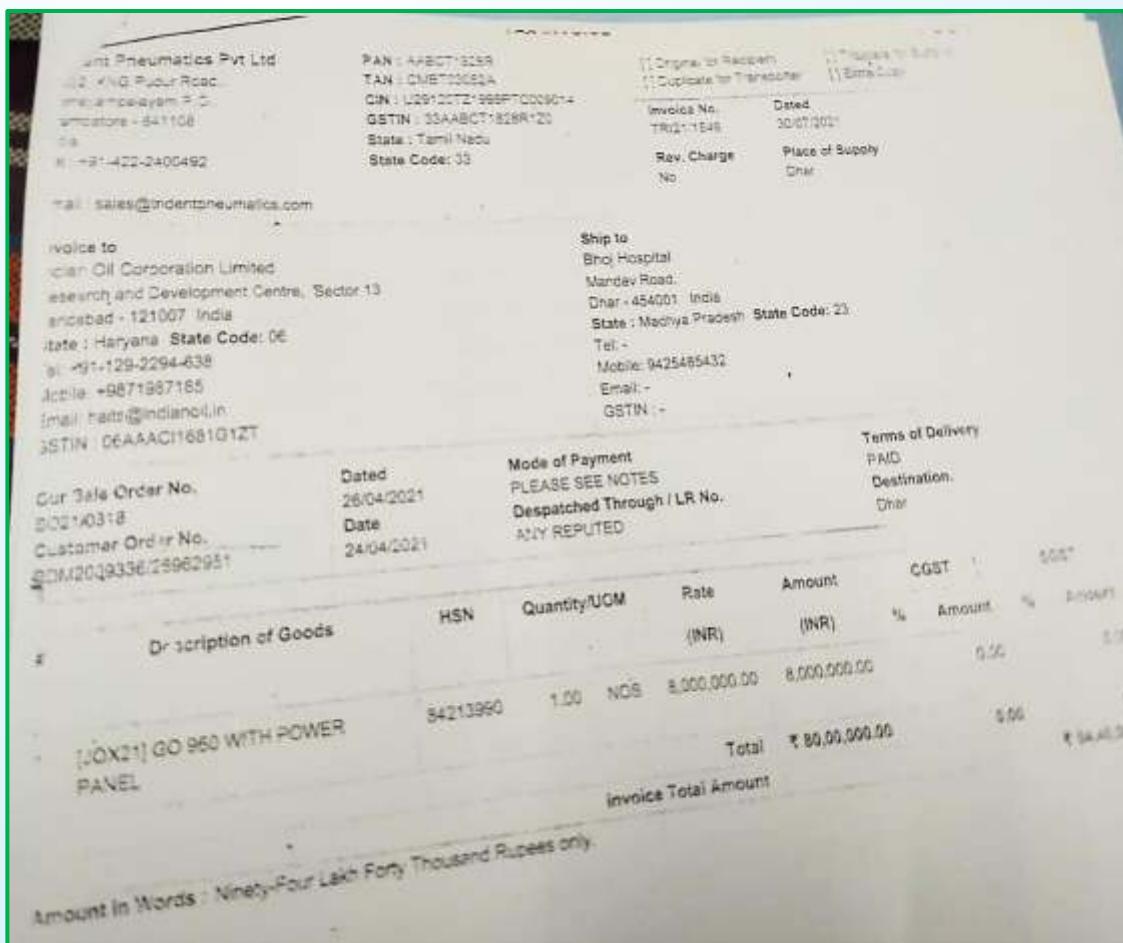
## Chapter -8

### 8.1 Bhoj District Hospital, Dhar, Madhya Pradesh

#### A General Information

The Plant (GO 960 model) in Bhoj District Hospital, Mandav Road, Dhar was installed and commissioned in July 2021 at a cost of Rs 94, 40,000 and the same was handed over to the Hospital in August 2021 for the supply of Oxygen to the patients of the Hospital. The plant was operational and was supplying oxygen until a few months back. On the day of the visit it was found operational but was not being used as demand was not there.

At the time of installation PSA plant installation was 4.3 bar and oxygen purity of 92%. The expected oxygen purity is 90 to 96% as per Trident Pneumatics.



#### B OPERATION AND MAINTENANCE

The contract for maintenance, post the warranty, was given to a company namely AOV International, a company that manufactures and maintain the medical equipments. This company did not address the problems in Plant despite repeated reminders from the Hospital.

The Manufacturer, Trident Pneumatics give one year warranty to the PSA plant and after the expiry of warranty it was to be maintained by the Hospital and the State government was likely to make some provision for it. The State government hired the AMC services of AOV International and this organization started to maintain it after the expiry of the warranty. The operator said that that at times they had to take help from IOCL official to ensure the services of the company which installed it. For Trident Pneumatics the customer is IOCL and not the Hospital and therefore they technically can entertain a service request from IOCL only. So the Hospitals at times had to write to IOCL to ensure the services of Trident Pneumatics.

The plant as reported by the operator is fully automatic. It hardly needs any assistance in its operation. One person was found to be involved in its maintenance. It is only required to monitor the purity and flow of the oxygen generated. As per the Operator the plant has a provision that it would automatically trip if the purity goes down the desired level.

## C Output

The full output capacity of the plant is reported to be 960 LPM and can work to its capacity. The study team reported the purity at the time of visit as 91-92 which is considered good but it was found out that it gradually improves after long operation. When there is no demand they keep it shut or use the time for its servicing. Its purity mostly stays above this 94-95. On a normal day the Plant provides oxygen to 60-65 patients on a normal day. But during Covid time it is reported that around 85 to 95 patients were given oxygen per day.

### 8.2 The Beneficiary perspective

The perspective of beneficiaries was a must to understand the impact of the intervention. Beneficiaries were interviewed to capture the perception about the availability, adequacy and purity of the oxygen supply during their stay in the Hospital. Among three parameters they were only sure about the availability and supply of oxygen as they were not sure about the adequacy or the purity of the oxygen supplied.

City Name	Hospital Name	Table.70: Is the respondent a beneficiary or he is an attendant					
		Beneficiary		Beneficiary' Attendant		Overall	
		Count	%	Count	%	Count	%
DHAR	BHOJ DISTRICT HOSPITAL DHAR	5	100%	0	0%	5	100%

All the respondents were the beneficiaries themselves.

City Name	Hospital Name	Table.71: Gender of Respondent							
		Male		Female		Other		Total	
		Count	%	Count	%	Count	%	Count	%
DHAR	BHOJ DISTRICT HOSPITAL DHAR	0	0%	5	100%	0	0%	5	100%

All five respondents were female only.

City Name	Hospital Name	Table.72: Social Category							
		Gen		OBC		SC/ST		Total	
		No	%	No	%	No	%	No	%
DHAR	BHOJ DISTRICT HOSPITAL DHAR	1	20%	4	80%	0	0%	5	100%

Four were from OBC and one from General category.

City Name	Hospital Name	Table.73: Was the oxygen provided on time							
		Yes		No		Total			
		Count	%	Count	%	Count	%	Count	%
DHAR	BHOJ DISTRICT HOSPITAL DHAR	5	100%	0	0%	5	100%		

They all maintained that the oxygen was provided on time.

City Name	Hospital Name	Table.74: What was the reason for Hospitalization?							
		Covid 19 infected		Other diseases		Total			
		Count	%	Count	%	Count	%	Count	%
DHAR	BHOJ DISTRICT HOSPITAL DHAR	1	20%	4	80%	5	100%		

Four of them got hospitalized for other diseases and one for Covid infection.

City Name	Hospital Name	Table.75: What was the duration of Hospitalization? (In Days)							
		1d		4d		7d		Total	
		Count	%	Count	%	Count	%	Count	%
DHAR	BHOJ DISTRICT HOSPITAL DHAR	3	60%	1	20%	1	20%	5	100%

Three stayed in the Hospital for one day, one for four days and one for 7 days.

City Name	Hospital Name	Table.76: Was Oxygen supply free or chargeable							
		Free		Chargeable		Don't remember/Can't Say		Total	
		Count	%	Count	%	Count	%	Count	%
DHAR	BHOJ DISTRICT HOSPITAL DHAR	5	100%	0	0%	0	0%	5	100%

The oxygen supply was all free.

City Name	Hospital Name	Table.77: Did the Oxygen supply help patient recover from the Covid 19 or the patient or they yet succumbed to it?							
		Yes patient recovered from Covid 19		No the patient succumbed to it		Patient was provided oxygen for some other diseases		Total	
		Count	%	Count	%	Count	%	Count	%
DHAR	BHOJ DISTRICT HOSPITAL DHAR	1	20%	0	0%	4	80%	5	100%

The Covid patient recovered from it and the other four got it for some other ailments.

City Name	Hospital Name	Table.78: Do you think that the supply of oxygen was adequate							
		Yes Adequate		No, Adequate		Can't Say		Total	
		Count	%	Count	%	Count	%	Count	%
DHAR	BHOJ DISTRICT HOSPITAL DHAR	1	20%	0	0%	4	80%	5	100%

The Covid patient who recovered said that the supply of the oxygen was adequate while the other four said that they are not so sure about it.

City Name	Hospital Name	Table.79: Which documents can you show to verify that the patient was admitted to the Hospital for the Covid 19 treatment? (Admission slip)							
		Yes		No		Doc. Seen		Total	
		Count	%	Count	%	Count	%	Count	%
DHAR	BHOJ DISTRICT HOSPITAL DHAR	5	100%	0	0%	0	0%	5	100%

All five had the admission slips but none could show them.

City Name	Hospital Name	Table.80: Which documents can you show to verify that the patient was admitted to the Hospital for the Covid 19 treatment? (Discharge slip)							
		Yes		No		Doc. Seen		Total	
		Count	%	Count	%	Count	%	Count	%
DHAR	BHOJ DISTRICT HOSPITAL DHAR	5	100%	0	0%	0	0%	5	100%

All five claimed to have discharge slip but none could show it.

City Name	Hospital Name	Table.81: Which documents can you show to verify that the patient was admitted to the Hospital for the Covid 19 treatment? (Medicine prescription of the Hospital)							
		Yes		No		Doc. Seen		Total	
		Count	%	Count	%	Count	%	Count	%
DHAR	BHOJ DISTRICT HOSPITAL DHAR	0	0%	5	100%	0	0%	5	100%

None of them had any medical prescriptions with them anymore.

City Name	Hospital Name	Table.82: Did you get the treatment as BPL category					
		Yes		No		Total	
		Count	%	Count	%	Count	%
DHAR	BHOJ DISTRICT HOSPITAL DHAR	1	20%	4	80%	5	100%

One of them was from BPL category.

City Name	Hospital Name	Table.83: Overall Are you satisfied with the supply of the oxygen by the Hospital							
		Satisfied		Not Satisfied		Can't Say		Total	
		Count	%	Count	%	Count	%	Count	%
DHAR	BHOJ DISTRICT HOSPITAL DHAR	5	100%	0	0%	0	0%	5	100%

All of them were satisfied about the supply of the Oxygen.

### 8.3 The Doctor's Perspective

The doctors said that the Hospital immensely benefitted from this Hospital and though they had other sources of supply of the oxygen but yet it helped them to meet the instant surge in the demand in critical times.

They did have to face problems at times but on most occasions they had the sufficiency of supply to meet the requirement. This plant made them feel confident and relax as a support unit was also available. However, during Covid time many lives were saved due to the oxygen supply of this plant. It was difficult to ascertain that how much it catered to Covid patients or the other disease patients.

The doctors suggested that the plant has been a big help but its maintenance has been an issue.

Earlier they had to depend on the LMO and oxygen cylinders but now they have alternatives like plants provided by IOCL. The doctors were quite appreciative of the CSR intervention as it saved the lives of many Covid victims and helped other patients too.

### OPERATORS FEEDBACK



## Chapter -9

### 9.1 District Hospital Rajgarh, Madhya Pradesh

#### A General Information



The Plant (GO 960 model) in Rajgarh District Hospital, Rajgarh installed and commissioned in July 2021 at a cost of Rs 94,40,000 and the same was handed over to the Hospital August 2021 for the supply of Oxygen. The plant was operational and was supplying oxygen until three months back. On the day of the visit it was not found operational as it was not being used because of problem in meter reading. The plant is operational but is not being used as they would not know what quality of oxygen is being supplied.

At the time of installation PSA plant installation was 4.3 bar and oxygen purity of 95%. The expected oxygen purity is 90 to 96% as per Trident Pneumatics.



## B OPERATION AND MAINTENANCE

The AOV International, a company that manufactures and maintains the medical equipments was given the responsibility of maintaining the PSA plant by the State government. The company started maintaining it after the expiry of the warranty.



The plant being fully automatic it hardly needs any assistance in its operation. One person was reported to be involved in its operation. It is only required to monitor the purity and flow of the oxygen generated. The operator said that when it was operational in August 2021 it did help patients get oxygen easily. But the plant was installed after the peak of the Covid, patients of other diseases were benefitted more.

## C Output

The capacity of the plant is given as 960 LPM. The purity at the time of visit is 91-92 but mostly it is even better than that. Around 40 to 45 patients get oxygen on a normal day. But during days following Covid peak time around 60 to 70 patients were given oxygen per day. On a few days it was even more than that.

### 9.2 The Beneficiary perspective

Beneficiaries were interviewed to capture the perception about the availability, adequacy and purity of the oxygen supply during their stay in the Hospital. Among three parameters they were only sure about the availability and supply of oxygen as they were not sure about the adequacy or the purity of the oxygen supplied.

All the respondents were beneficiaries themselves but in some cases their attendants were called in to give their feedback too when the beneficiaries were not in a position of answers the questions. So in this case the feedback collected is those form the beneficiaries with some inputs from the attendants too.

City Name	Hospital Name	Table.84: Is the respondent a beneficiary or he is an attendant					
		Beneficiary		Beneficiary's Attendant		Overall	
		Count	%	Count	%	Count	%
RAJGARH	DISTRICT HOSPITAL RAJGARH	5	100%	0	0%	5	100%

All the respondents were the beneficiaries themselves.

City Name	Hospital Name	Table.85: Gender of Respondent							
		Male		Female		Other		Total	
		Count	%	Count	%	Count	%	Count	%
RAJGARH	DISTRICT HOSPITAL RAJGARH	4	80.0%	1	20.0%	0	0%	5	100%

Four respondents were female and one male only.

City Name	Hospital Name	Table.86: Social Category							
		Gen		OBC		SC/ST		Total	
		Count	%	Count	%	Count	%	Count	%
RAJGARH	DISTRICT HOSPITAL RAJGARH	1	20.0%	2	40.0%	2	40.0%	5	100.0%

Two were from OBC and SC each and one from General category.

City Name	Hospital Name	Table.87: Was the oxygen provided on time					
		Yes		No		Total	
		Count	%	Count	%	Count	%
RAJGARH	DISTRICT HOSPITAL RAJGARH	5	100%	0	0%	5	100%

They all maintained that the oxygen was provided on time.

City Name	Hospital Name	Table.88: What was the reason for Hospitalization?					
		Covid 19 infected		Other diseases		Total	
		No	%	No	%	No	%
RAJGARH	DISTRICT HOSPITAL RAJGARH	1	20%	4	80%	5	100%

Four of them got hospitalized for other diseases and one for Covid infection.

City Name	Hospital Name	Table.89: What was the duration of Hospitalization?							
		1		4		7		Total	
		Count	%	Count	%	Count	%	Count	%
RAJGARH	DISTRICT HOSPITAL RAJGARH	2	40.0%	2	40.0%	1	20%	5	100%

Two stayed in the Hospital for one day, one for four days and one for 7 days.

City Name	Hospital Name	Table.90: Was Oxygen supply free or chargeable							
		Free		Chargeable		Don't remember/Can't Say		Total	
		Count	%	Count	%	Count	%	Count	%
RAJGARH	DISTRICT HOSPITAL RAJGARH	5	100%	0	0%	0	0%	5	100%

As reported by the respondents the oxygen supply was all free.

City Name	Hospital Name	Table.91: Did the Oxygen supply help patient recover from the Covid 19 or the patient yet succumbed to it?							
		Yes patient recovered from Covid 19		No the patient succumbed to it		Patient was provided oxygen for some other disease		Total	
		Count	%	Count	%	Count	%	Count	%
RAJGARH	DISTRICT HOSPITAL RAJGARH	1	20%	0	0%	4	80%	5	100%

One Covid patient recovered from it and the other four got it for some other ailments.

City Name	Hospital Name	Table.92: Do you think that the supply of oxygen was adequate							
		Yes Adequate		No, Adequate		Can't Say		Total	
		Count	%	Count	%	Count	%	Count	%
RAJGARH	DISTRICT HOSPITAL RAJGARH	1	20%	1	20%	3	60%	5	100%

The Covid patient who recovered said that the supply of the oxygen was adequate while the other four said that they are not so sure about it.

City Name	Hospital Name	Table.93: Which documents can you show to verify that the patient was admitted to the Hospital for the Covid 19 treatment? (Admission slip)							
		Yes		No		Doc. Seen		Total	
		Count	%	Count	%	Count	%	Count	%
RAJGARH	DISTRICT HOSPITAL RAJGARH	5	100%	0	0%	0	0%	5	100%

All five had the admission slips but none could show them.

City Name	Hospital Name	Table.94: Which documents can you show to verify that the patient was admitted to the Hospital for the Covid 19 treatment? (Discharge slip)							
		Yes		No		Doc. Seen		Total	
		Count	%	Count	%	Count	%	Count	%
RAJGARH	DISTRICT HOSPITAL RAJGARH	5	100%	0	0%	0	0%	5	100%

All five claimed to have discharge slip but none could show it.

City Name	Hospital Name	Table.95: Which documents can you show to verify that the patient was admitted to the Hospital for the Covid 19 treatment? (Medicine Prescription of the Hospital)							
		Yes		No		Doc. Seen		Total	
		Count	%	Count	%	Count	%	Count	%
RAJGARH	DISTRICT HOSPITAL RAJGARH	5	100%	0	0%	0	0%	5	100%

None of them had any medical prescriptions with them anymore.

City Name	Hospital Name	Table.96: Which documents can you show to verify that the patient was admitted to the Hospital for the Covid 19 treatment? (Covid 19 report of the Hospital)							
		Yes		No		Doc. Seen		Total	
		Count	%	Count	%	Count	%	Count	%
RAJGARH	DISTRICT HOSPITAL RAJGARH	2	20%	3	60%	0	0%	5	100%

City Name	Hospital Name	Table.97: Which documents can you show to verify that the patient was admitted to the Hospital for the Covid 19 treatment? (Nothing is available)							
		Yes		No		Doc. Seen		Total	
		Count	%	Count	%	Count	%	Count	%
RAJGARH	DISTRICT HOSPITAL RAJGARH	0	0%	5	100%	0	0%	5	100%

City Name	Hospital Name	Table.98: Did you get the treatment as BPL category					
		Yes		No		Total	
		Count	%	Count	%	Count	%
RAJGARH	DISTRICT HOSPITAL RAJGARH	0	0%	5	100%	5	100%

None of them was from BPL category.

City Name	Hospital Name	Table.99: Overall Are you satisfied with the supply of the oxygen by the Hospital							
		Satisfied		Not Satisfied		Can't Say		Total	
		Count	%	Count	%	Count	%	Count	%
RAJGARH	DISTRICT HOSPITAL RAJGARH	5	100%	0	0%	0	0%	5	100%

All of them were satisfied about the supply of the Oxygen.

### 9.3 The Doctor's Perspective

The doctors said that the Hospital immensely benefitted from this Hospital as it helped the Hospital saved many lives during Covid time. The PSA plant provided by the IOCL helped them to meet the instant surge in the demand in critical times.

On most occasions they had the sufficiency of supply to meet the requirement. This plant made them feel confident and relax as a support unit was also available. However, during Covid time many lives were saved due to the oxygen supply of this plant. It was difficult to ascertain that how much it catered to Covid patients or the other disease patients.

In the doctors' perception the plant has been a big help and for the benefit of patients the Hospital does everything to maintain it. The Hospital is also is trying to further improve the maintenance to avoid any likely time lag in the rectification of the problems.

Doctors also pointed out that earlier they had to depend on the LMO and oxygen cylinders but now they have alternatives like plants provided by IOCL. The doctors were quite appreciative of the CSR intervention as it saved the lives of many Covid victims and helped other patients too.

## Chapter -10

### 10.1 District Vikash Multispecialty Hospital Bargarh, Odisha

#### A General Information

Two PSA Plants (GO 960 model) were installed and commissioned around September 2021 at a cost of Rs 94,40,000.00 each and the same was handed over to Vikash Multispecialty Hospital Bargarh around the same time in 2021. The plants have been operational and supplying oxygen ever since. When the study team visited it was found operational. It was reported that the installation was without any hindrance.

As reported the time of installation PSA plant installation was 4.1 and 4.4 bar respectively for Plant 1 and plant 2. The purity of oxygen reported to be 91% and 93% respectively. The expected oxygen purity is 90% to 96% as per Trident Pneumatics and it is reported it was as per the given range.

The PSA Plant was installed by the manufacturer Trident Pneumatic which gave one year warranty for its maintenance. The company installed PSA type oxygen generator plant in the Hospitals across the selected districts of the state. The installation was reportedly smooth and without any trouble.



#### B OPERATION AND MAINTENANCE

Both plants were given a warranty for one year and subsequently it was to be maintained by the Hospital. As long as the plant was under warranty, the same is maintained by M/s Trident Pneumatics.

The warranty period was for one year and therefore the first year the two plants were maintained by the Trident Pneumatic but in the subsequent year it was maintained by the Hospital. The operator said that they functioned seamlessly even after the expiry of the warranty but you need to monitor its meter constantly to ensure that the plants are operating at a desired pressure and flow with required purity of oxygen. The two plants though worked with great efficiency but whenever there was any minor trouble, the same was soon addressed immediately by the Hospitals. The Operator said that sometimes they took help from IOCL officials in ensuring its smooth operation. The IOCL being the customer of TP Company always gave support whenever required.

The purity of the oxygen varies between 90% to 96% and it was always good enough for the patients. Even in some cases children were given the same oxygen without any problem at all.

The plant is fully automatic which makes the operation easier. One person was reportedly deployed for its operation. Since the plant is fully automatic it hardly needs any assistance in its operation. It is only required to monitor the purity and flow of the oxygen generated.

## C Output

It provides oxygen to 70 to 75 patients on a normal day. But during Covid time around 115 to 120 patients were given oxygen per day. On a few days the number rose to 150 and more.

### 10.2 The Beneficiary perspective

In order to understand the impact of PSA oxygen supply plant beneficiaries were interviewed to capture the perception about efficacy of the oxygen supply during their stay in the Hospitals. Attendants of some patients said that the constant supply was there and they managed to get it during Covid time. The patients of Covid days did not like to recall the time and it took a while to take feedback from them. Except for the Covid time when the plant was not sufficient to meet the demand it was of good support for the normal time patients.

Attendants were more observant about the facilities being provided to the patients the study team interacted with attendants and patients both. The study team observed that the patients had little idea about the treatment and facilities provided to them. Therefore, both the patients were contacted as per their availability.

City Name	Hospital Name	Table.100: Is the respondent a beneficiary or he is an attendant					
		Beneficiary		Beneficiary's Attendant		Overall	
		Count	%	Count	%	Count	%
BARGARH	2 PLANTS IN VIKASH MULTISPECIALITY HOSPITAL	1	17%	5	83%	6	100%

Five out of 6 respondents were attendants of beneficiaries.

City Name	Hospital Name	Table.101: Gender of Respondent							
		Male		Female		Other			
		Count	%	Count	%	Count	%		
BARGARH	2 PLANTS IN VIKASH MULTISPECIALITY HOSPITAL	5	83%	1	17%	0	0%	6	100%

Five of the respondents were male and one is female.

City Name	Hospital Name	Table.102: Social Category							
		Gen		OBC		SC/ST			
		Count	%	Count	%	Count	%		
BARGARH	2 PLANTS IN VIKASH MULTISPECIALITY HOSPITAL	4	67%	2	33%	0	0%	6	100%

As for the social demography of the respondents four out of 6 were from general category where as one was from OBC.

City Name	Hospital Name	Table.103: Was the oxygen provided on time					
		Yes		No		Total	
		Count	%	Count	%	Count	%
BARGARH	2 PLANTS IN VIKASH MULTISPECIALITY HOSPITAL	6	100%	0	0%	6	100%

All six beneficiaries had got oxygen all free as reported.

City Name	Hospital Name	Table.104: What was the reason for Hospitalization?					
		Covid 19 infected		Other diseases		Total	
		Count	%	Count	%	Count	%
BARGARH	2 PLANTS IN VIKASH MULTISPECIALITY HOSPITAL	6	100%	0	0%	6	100%

All six were Covid patients and they got hospitalized for the same reason.

City Name	Hospital Name	Table.105: What was the duration of Hospitalization? (In days)											
		1d		3d		8d		9d		14d		Total	
		Count	%	Count	%	Count	%	Count	%	Count	%	Count	%
BARGARH	2 PLANTS IN VIKASH MULTISPECIALITY HOSPITAL	1	17%	2	33%	1	17%	1	17%	1	17%	6	100%

For most respondents Hospitalization was more than one day and less than 9 days. One patient was hospitalized for 14 days.

City Name	Hospital Name	Table.106: Was Oxygen supply free or chargeable							
		Free		Chargeable		Don't remember/Can't Say		Total	
		No	%	No	%	No	%	No	%
BARGARH	2 PLANTS IN VIKASH MULTISPECIALITY HOSPITAL	5	67%	0	33%	1	0%	6	100%

Five of them said that the supply was all free only one said that he does not remember whether he paid or not.

City Name	Hospital Name	Table.107: Did the Oxygen supply help patient recover from the Covid 19 or the patient yet succumbed to it?							
		Yes patient recovered from Covid 19		No the patient succumbed to it		Patient was provided oxygen for some other disease		Total	
		Count	%	Count	%	Count	%	Count	%
BARGARH	2 PLANTS IN VIKASH MULTISPECIALITY HOSPITAL	5	83%	0	0%	1	17%	6	100%

Five out of 6 said that the oxygen supply helped them recover from the Covid infliction.

City Name	Hospital Name	Table.108: do you think that the supply of oxygen was adequate							
		Yes Adequate		No Adequate		Can't Say		Total	
		No	%	No	%	No	%	No	%
BARGARH	2 PLANTS IN VIKASH MULTISPECIALITY HOSPITAL	6	100%	0	0%	0	0%	6	100%

All six affirmed that the oxygen supply was adequate and faced no crisis for the same.

City Name	Hospital Name	Table.109: Which documents can you show to verify that the patient was admitted to the Hospital for the Covid 19 treatment? (Admission slip)							
		Yes		No		Doc. Seen		Total	
		Count	%	Count	%	Count	%	Count	%
BARGARH	2 PLANTS IN VIKASH MULTISPECIALITY HOSPITAL	4	67%	2	33%	0	0%	6	100%

Four of the respondents said that they had the admission slip and the discharge slips with medicine prescriptions but failed to show to the study team. The remaining 2 said they no longer have anything.

City Name	Hospital Name	Table.110: Which documents can you show to verify that the patient was admitted to the Hospital for the Covid 19 treatment? (Discharge slip)							
		Yes		No		Doc. Seen		Total	
		Count	%	Count	%	Count	%	Count	%
BARGARH	2 PLANTS IN VIKASH MULTISPECIALITY HOSPITAL	4	67%	2	33%	0	0%	6	100%

Four of the respondents said that they have discharge slips to verify that they were admitted to the said Hospital but could not show them to the study as they had got reportedly misplaced.

City Name	Hospital Name	Table.111: Which documents can you show to verify that the patient was admitted to the Hospital for the Covid 19 treatment? (Medicine prescription of the Hospital)							
		Yes		No		Doc. Seen		Total	
		Count	%	Count	%	Count	%	Count	%
BARGARH	2 PLANTS IN VIKASH MULTISPECIALITY HOSPITAL	4	67%	2	33%	0	0%	6	100%

The same four respondents claimed to be having medical prescriptions too but could not show when asked to do the same.

City Name	Hospital Name	Table.112: Which documents can you show to verify that the patient was admitted to the Hospital for the Covid 19 treatment? (Covid 19 report of the Hospital)							
		Yes		No		Doc. Seen		Total	
		Count	%	Count	%	Count	%	Count	%
BARGARH	2 PLANTS IN VIKASH MULTISPECIALITY HOSPITAL	4	67%	2	33%	0	0%	6	100%

The four respondents claimed that they had the Covid report but could not furnish for the verification.

City Name	Hospital Name	Table.113: Overall Are you satisfied with the supply of the oxygen by the Hospital							
		Satisfied		Not Satisfied		Can't Say		Total	
		Count	%	Count	%	Count	%	Count	%
BARGARH	2 PLANTS IN VIKASH MULTISPECIALITY HOSPITAL	6	100%	0	0%	0	0%	6	100%

Overall, respondents were reportedly satisfied with the supply of the oxygen. Most of them praised IOCL when they were told that the IOCL (R&D) had taken the initiative of providing oxygen to the patients through PSA Plants and that too all free. A couple of them said that they otherwise could not have afforded it. One of them said in private Hospitals oxygen was selling very high and was thus beyond their reach.

### 10.3 The Doctor's Perspective

The doctors highly appreciated the CSR initiatives of the IOCL. The senior doctors pointed out that it was great intervention by the IOCL which saved many lives. They said that the Hospital is maintaining it well now and at times they take help from IOCL officials to reach the company when any such minor problem occurs. They also suggested that the state government should come up with the provision of arranging AMC for the plant to allow a backup support. For now, the Hospital is taking care of it very well but in future this may not be sufficient.

However, during Covid time many lives were saved due to the oxygen supply of the two PSA plants. It was difficult to ascertain that how much it catered to Covid patients or the other disease patients.

In the past doctors had to depend on the LMO and oxygen cylinders but now they have alternatives like plants provided by IOCL. The doctors were quite appreciative of the CSR intervention as it saved the lives of many Covid victims and helped other patients too.

## Chapter -11

### 11.1 District Headquarters Hospital Puri, Odisha

#### A General Information

The Plant (GO 960 model) in District Hospital, Puri was installed and commissioned on August 2021 at a cost of Rs 94,40,000.00 and the same was handed over to the Hospital in September 2021. The plant is reported to be operational and supplying oxygen ever since. On the day of the visit it was also found operational. Other than this there are LMO tanks and Oxygen cylinder to meet the demand.

At the time of installation PSA plant installation was 4.2 bar and oxygen purity of 94 %. The expected oxygen purity is 90 to 96% as per Trident Pneumatics. The purity is said to be good enough for the patients.

The IOCL provided these plants through a company namely Trident Pneumatics (TP), a company that installed PSA type oxygen generator plant in the Hospitals across the selected districts of the state. Puri was as one of the selected districts.

#### B. OPERATION AND MAINTENANCE

As reported by the Hospital the state government, unlike UP and MP, did not make any provision for its Annual Maintenance. Therefore, there is no AMC (Annual Maintenance Contract) and currently it is being maintained by the Hospital itself. The Hospital is maintaining it very well but they hope that AMC will be there soon. The plant was to be maintained by the Hospital after the expiry of the warranty which was reportedly one year.

The plant was new and automatic so it functioned seamlessly after installation. After some months minor glitches were there and they were handled well. On the whole the plant remained operational and was of immense help to the Hospital and its patients, as end users.

The plant is run on power supply and if the supply of electricity is uninterrupted it functions well. But when it is interrupted and power outage is there it is difficult to run the plant. Even the power goes for a few minutes it becomes a problem to re-run it. In such events they use LMO tank or Oxygen Cylinders.

Also the demand fluctuates because of many factors like seasonality involved in diseases, epidemic or pandemic times and the plant is pressed into service to meet this demand. In normal time the Hospital uses old methods of supplying oxygen through LMO tanks and Oxygen supply.

It ran smoothly ever since it was installed. The service engineers used to visit and took due care of the plant. At the time of visit the plant was operational with its capacity and supplied oxygen with the needed purity.



The Operator had become experienced after running it for quite some time and claimed that if regular required fuel is made available it would keep running well as it has been since its installation.

Its operation is easy as it is automatic and one person was reportedly handling it. It hardly needs any assistance in its operation when it is snag free. It is only required to monitor the purity and flow of the oxygen generated.

### C. Output

The capacity of the plant was found to be 960 LPM. The purity at the time of visit is 94-95 which is reported to be good enough for the patients. More than 60-70 patients were given oxygen on a normal day. But during Covid time around 115 to 120 patients were given oxygen which is quite a commendable effort as many lives were saved.

#### 11.2 The Beneficiary perspective

It is beneficiaries' perspective that holds key to any impact assessment and here it is about efficacy of the oxygen supply during their stay in the Hospitals. During Covid times the plant was not sufficient to meet the demand yet it was of a valuable support for the Hospital. The beneficiaries were not aware where the oxygen they were getting from but the interactions revealed that the intervention was a major success and contributed in a tremendous way to saving the lives of people in the region.

Mostly it was beneficiaries' attendants who provided feedback as they were supposed to have interacted closely with the doctors and treatment given to the patients. Therefore, they observed and noticed more than the patient and hence the study team interacted with attendants and patients both; whoever available.

Tables given below provide the insight into the impact the CSR intervention had following the installation of PSA plant in the Hospital.

City Name	Hospital Name	Table.114: Is the respondent a beneficiary or he is an attendant					
		Beneficiary		Beneficiary' Attendant		Overall	
		Count	%	Count	%	Count	%
PURI	DISTRICT HEADQUARTERS HOSPITAL	4	80%	1	20%	5	100%

Four out of five respondents were beneficiaries themselves and the one was the attendant.

City Name	Hospital Name	Table.115: Gender of Respondent							
		Male		Female		Other		Total	
		Count	%	Count	%	Count	%	Count	%
PURI	DISTRICT HEADQUARTERS HOSPITAL	4	80%	1	20%	0	0%	5	100%

Four of them were male and one female.

City Name	Hospital Name	Table.116: Social Category							
		Gen		OBC		SC/ST		Total	
		Count	%	Count	%	Count	%	Count	%
PURI	DISTRICT HEADQUARTERS HOSPITAL	4	80%	1	20%	0	0%	5	100%

Four belong to social category and one to OBC.

City Name	Hospital Name	Table.117: Was the oxygen provided on time							
		Yes		No		Total			
		Count	%	Count	%	Count	%	Count	%
PURI	DISTRICT HEADQUARTERS HOSPITAL	5	100%	0	0%	5	100%		

All respondents said that the oxygen was provided on time.

City Name	Hospital Name	Table.118: What was the reason for Hospitalization?							
		Covid 19 infected		Other diseases		Total			
		Count	%	Count	%	Count	%	Count	%
PURI	DISTRICT HEADQUARTERS HOSPITAL	2	40%	3	60%	5	100%		

The reason for Hospitalization for 2 patients was Covid and for the other three it was for some otherdiseases.

City Name	Hospital Name	Table.119: What was the duration of Hospitalization?									
		1		2		3		4		Total	
		Count	%	Count	%	Count	%	Count	%	Count	%
PURI	DISTRICT HEADQUARTERS HOSPITAL	3	60%	2	40%	0	0%	0	0%	5	100%

Two were hospitalized for two days and three were hospitalized for a day each.

City Name	Hospital Name	Table.120: Was Oxygen supply free or chargeable							
		Free		Chargeable		Don't remember/Can't Say		Total	
		Count	%	Count	%	Count	%	Count	%
PURI	DISTRICT HEADQUARTERS HOSPITAL	5	100%	0	0%	0	0%	5	100%

The oxygen supply was all free.

City Name	Hospital Name	Table.121: Did the Oxygen supply help patient recover from the Covid 19 or the patient yet succumbed to it?							
		Yes patient recovered from Covid 19		No the patient succumbed to it		Patient was provided oxygen for some other disease		Total	
		Count	%	Count	%	Count	%	Count	%
PURI	DISTRICT HEADQUARTERS HOSPITAL	2	40%	0	0%	3	60%	5	100%

Two Covid patients did recover from it and the rest other patients were Hospitalized for some otherdiseases.

City Name	Hospital Name	Table.122: Do you think that the supply of oxygen was adequate							
		Yes Adequate		Not Adequate		Can't Say		Total	
		Count	%	Count	%	Count	%	Count	%
PURI	DISTRICT HEADQUARTERS HOSPITAL	5	100%	0	0%	0	0%	5	100%

All of them said that the supply was adequate and seamless and they did not have to face any difficulty what so ever with regard to the supply.

City Name	Hospital Name	Table.123: Which documents can you show to verify that the patient was admitted to the Hospital for the Covid 19treatment? (Admission slip)							
		Yes		No		Doc. Seen		Total	
		Count	%	Count	%	Count	%	Count	%
PURI	DISTRICT HEADQUARTERS HOSPITAL	4	80%	1	20%	0	0%	5	100%

Four of them had admission slip and one said he did not have. No one could show any one of them.

City Name	Hospital Name	Table.124: Which documents can you show to verify that the patient was admitted to the Hospital for the Covid 19treatment? (Discharge slip)							
		Yes		No		Doc. Seen		Total	
		Count	%	Count	%	Count	%	Count	%
PURI	DISTRICT HEADQUARTERS HOSPITAL	0	0%	5	100%	0	0%	5	100%

Asked about the discharge slip none of them said they can provide.

City Name	Hospital Name	Table.125: Which documents can you show to verify that the patient was admitted to the Hospital for the Covid 19 treatment? (Medicine prescription of the Hospital)							
		Yes		No		Doc. Seen		Total	
		Count	%	Count	%	Count	%	Count	%
PURI	DISTRICT HEADQUARTERS HOSPITAL	0	0%	5	100%	0	0%	5	100%

No medicine prescriptions were available so nothing was shown to the study team.

City Name	Hospital Name	Table.126: Which documents can you show to verify that the patient was admitted to the Hospital for the Covid 19 treatment? (Covid 19 report of the Hospital)							
		Yes		No		Doc. Seen		Total	
		Count	%	Count	%	Count	%	Count	%
PURI	DISTRICT HEADQUARTERS HOSPITAL	0	0%	5	100%	0	0%	5	100%

Neither Covid patients nor the patients of other diseases could show any reports. They said it is a long time and are therefore difficult to trace them out.

City Name	Hospital Name	Table.127: Did you get the treatment as BPL category					
		Yes		No		Total	
		Count	%	Count	%	Count	%
PURI	DISTRICT HEADQUARTERS HOSPITAL	5	100%	0	0%	5	100%

All respondents got treatment as BPL category.

City Name	Hospital Name	Table.128: If yes, Was the oxygen supply was free?					
		Yes		No		Total	
		Count	%	Count	%	Count	%
PURI	DISTRICT HEADQUARTERS HOSPITAL	5	100%	0	0%	5	100%

All of them got the supply free.

City Name	Hospital Name	Table.129: Overall Are you satisfied with the supply of the oxygen by the Hospital					
		Satisfied		Not Satisfied		Can't say	
		Count	%	Count	%	Count	%
PURI	DISTRICT HEADQUARTERS HOSPITAL	5	100%	0	0%	0	0%

Overall they all were supplied with the oxygen supply in the Hospital.

### 11.3 The Doctor's Perspective

The doctors said that the plant was a great success and a good support during Covid time. They could match the demand to a great extent and many lives were saved. In the beginning it ran very well as everything was new and thus functioned very well when the demand peaked. Later on when the demand dipped it was not viable to run it as running cost would have been unnecessary expenses. It consumes lots of electricity and maintenance also becomes a problem in the absence of any AMC.

When the demand is high the plant is easy and less expensive to use and is pressed into service as supply of oxygen remains uninterrupted. They feel confident and relax if a support unit is also available. During Covid time many lives were saved due to the oxygen supply of this plant. It was difficult to ascertain that how much it catered to Covid patients or the other disease patients.

The doctors suggested that the plant has been a big help and it is being maintained well and things would be all the better if AMC comes into place. Yet the Hospital is doing all needful to make it run smoothly. They profusely thanked the IOCL for this CSR intervention.

The junior doctors too were quite appreciative of the CSR intervention as it saved the lives of many Covid victims and helped other patients too.

## Chapter -12

### 12.1 District Hospital Sambalpur, Odisha

#### A General Information



In the district HQ Hospital of Sambalpur a PSA plant of the 960 capacity was installed and commissioned around August 2021 at a cost of Rs 94,40,000.00 and the same was handed over for operation immediately after installation. The plant is operational and started supplying oxygen ever since. It is not used only when there is no big demand. The Hospital also used LMO tanks and cylinders too when the demand peaked.

At the time of visit of PSA plant the pressure was 4.5 bar and oxygen purity of 97%. The expected oxygen purity is 90% to 96% as per Trident Pneumatics. This is reported to be a good level of purity for the patients.

Like all other plants this plant too was installed by the same company namely Trident Pneumatics (TP) a company which on behalf of IOCL provided PSA type oxygen generator plant in the Hospitals across the selected districts of the state. Sambalpur district Hospital was one of them.

#### B OPERATION AND MAINTENANCE

The Hospital maintains it with its own funds. They successfully managed to do this with the help from IOCL local officials. One person was there to maintain its operation. Doctors said that they experience that the operation and maintenance has been smooth.

From the beginning there was one person to monitor it as it was all new and hardly need

assistance in its operation. The plant was new and automatic so it functioned seamlessly. Purity

of Oxygen has to be constantly monitored. One person was deployed to monitor the plant. The Trident Company provided necessary tips to the operator for having to monitor it after the expiry of warranty of one year.

It is running smoothly and has been in use as per the demand. When the demand is high it is used continuously and when it is low it is rested for a while.

One person is deployed for its operation. The plant automatically trips if the purity goes down the desired level.



### C Output

The plant's capacity is 960 LPM as reported by the operator and the doctors. The purity at the time of visit is 94-95 and it is always kept around that. It provides oxygen to 70 to 75 patients on a normal day. But during Covid time around 100 to 105 patients were given oxygen per day.

#### **The Beneficiary perspective**

Though the plant was operational but not being used at the time of visit as some construction work was going on nearby and it would have been dangerous to use it; the responses of beneficiaries show that they did not have to face any problem in the supply of oxygen when it was used. Interactions with beneficiaries indicated that they had no idea how the oxygen is arranged for them. But they seemed happy overall that they did not have to suffer like others at other places.

Mostly it was not the patient but the attendant who observed and noticed it, the study team interacted with attendants and patients both.

City Name	Hospital Name	Table.130: Is the respondent a beneficiary or he is an attendant					
		Beneficiary		Beneficiary' Attendant		Overall	
		Count	%	Count	%	Count	%
SAMBALPUR	DISTRICT HEAD QUARTER HOSPITAL	3	60%	2	40%	5	100%

Out of five respondents three were patients/beneficiaries and 2 their attendants.

City Name	Hospital Name	Table.131: Gender of Respondent							
		Male		Female		Other			
		Count	%	Count	%	Count	%		
SAMBALPUR	DISTRICT HEAD QUARTER HOSPITAL	2	40%	3	60%	0	0%	5	100%

Two of the respondents were male and three female.

City Name	Hospital Name	Table.132: Social Category							
		Gen		OBC		SC/ST			
		Count	%	Count	%	Count	%		
SAMBALPUR	DISTRICT HEAD QUARTER HOSPITAL	5	100%	0	0%	0	0%	5	100%

All five respondents were from general category.

City Name	Hospital Name	Table.133: Was the oxygen provided on time					
		Yes		No		Total	
		Count	%	Count	%	Count	%
SAMBALPUR	DISTRICT HEAD QUARTER HOSPITAL	5	100%	0	0%	5	100%

All five respondents maintained that the oxygen was provided on time.

City Name	Hospital Name	Table.134: What was the reason for Hospitalization?					
		Covid 19 infected		Other diseases		Total	
		Count	%	Count	%	Count	%
SAMBALPUR	DISTRICT HEAD QUARTER HOSPITAL	2	40%	3	60%	5	100%

Two of them got Hospitalized for the Covid treatment where as three got Hospitalized for other diseases.

City Name	Hospital Name	Table.135: What was the duration of Hospitalization? (In Days)							
		1d		3d		7d			
		Count	%	Count	%	Count	%		
SAMBALPUR	DISTRICT HEAD QUARTER HOSPITAL	1	20%	2	40%	2	40%	5	100%

The minimum Hospitalization for the respondents was for one day and the maximum was for 7 days.

City Name	Hospital Name	Table.136: Was Oxygen supply free or chargeable							
		Free		Chargeable		Don't remember/ Can't Say		Total	
		Count	%	Count	%	Count	%	Count	%
SAMBALPUR	DISTRICT HEAD QUARTER HOSPITAL	4	80%	0	0%	1	20%	5	100%

Four of the 5 respondents held that it was all free but one of them said he had no idea and was not sure.

City Name	Hospital Name	Table.137: Did the Oxygen supply help patient recover from the Covid 19 or the patient yet succumbed to it?							
		Yes patient recovered from Covid 19		No the patient succumbed to it		Patient was provided oxygen for some other disease		Total	
		Count	%	Count	%	Count	%	Count	%
SAMBALPUR	DISTRICT HEAD QUARTER HOSPITAL	2	40%	0	0%	3	60%	5	100%

The two Covid patients reportedly recovered from the ailment and the three got successfully treated for other diseases.

City Name	Hospital Name	Table.138: Do you think that the supply of oxygen was adequate							
		Yes Adequate		No, Adequate		Can't Say		Total	
		Count	%	Count	%	Count	%	Count	%
SAMBALPUR	DISTRICT HEAD QUARTER HOSPITAL	3	60%	0	0%	2	40%	5	100%

Three of the respondents said that the supply was adequate but two of them said they were not sure. At least no one said that it was not adequate. Doctors claimed that it was adequate and the PSA plant had a major role to play in its adequacy.

City Name	Hospital Name	Table.139: Which documents can you show to verify that the patient was admitted to the Hospital for the Covid 19 treatment? (Admission slip)							
		Yes		No		Doc. Seen		Total	
		Count	%	Count	%	Count	%	Count	%
SAMBALPUR	DISTRICT HEAD QUARTER HOSPITAL	5	100%	0	0%	0	0%	5	100%

All five of them claimed to have both admission slip and discharge slips but only 2 claimed to have medicine prescriptions of the Hospital too. But none could show them to our study team.

City Name	Hospital Name	Table.140: Which documents can you show to verify that the patient was admitted to the Hospital for the Covid 19 treatment? (Discharge slip)							
		Yes		No		Doc. Seen		Total	
		Count	%	Count	%	Count	%	Count	%
SAMBALPUR	DISTRICT HEAD QUARTER HOSPITAL	5	0%	0	0%	0	0%	5	100%

The respondents said they had discharge slips too but cannot show to the study team as got misplaced longtime back.

City Name	Hospital Name	Table.141: Which documents can you show to verify that the patient was admitted to the Hospital for the Covid 19 treatment? (Medicine prescription of the Hospital)							
		Yes		No		Doc. Seen		Total	
		Count	%	Count	%	Count	%	Count	%
SAMBALPUR	DISTRICT HEAD QUARTER HOSPITAL	2	40%	3	60%	0	0%	5	100%

The two Covid patients said that they have the Covid medicine prescriptions but failed to show as it not available with them then.

City Name	Hospital Name	Table.142: Which documents can you show to verify that the patient was admitted to the Hospital for the Covid 19 treatment? (Covid 19 report of the Hospital)							
		Yes		No		Doc. Seen		Total	
		Count	%	Count	%	Count	%	Count	%
SAMBALPUR	DISTRICT HEAD QUARTER HOSPITAL	2	40%	3	60%	0	0%	5	100%

Two of the Covid respondents claimed to have Covid report but could not show them.

City Name	Hospital Name	Table.143: Did you get the treatment as BPL category							
		Yes		No		Total			
		Count	%	Count	%	Count	%	Count	%
SAMBALPUR	DISTRICT HEAD QUARTER HOSPITAL	1	20%	4	80%	5	100%		

One of them got the treatment as BPL category.

City Name	Hospital Name	Table.144: If yes, Was the oxygen supply was free?							
		Yes		No		Total			
		Count	%	Count	%	Count	%	Count	%
SAMBALPUR	DISTRICT HEAD QUARTER HOSPITAL	1	100%	0	0%	1	100%		

All five said the oxygen supply was free.

City Name	Hospital Name	Table.145: Overall Are you satisfied with the supply of the oxygen by the Hospital							
		Satisfied		Not Satisfied		Can't Say		Total	
		Count	%	Count	%	Count	%	Count	%
SAMBALPUR	DISTRICT HEAD QUARTER HOSPITAL	5	100%	0	0%	0	0%	5	100%

All five were reportedly satisfied with the oxygen supply of the Hospital.

### 12.3 The Doctor's Perspective

The doctors were full of praise for such CSR initiatives by the IOCL R&D. They welcomed it and regretted that it is not being used at the time of visit of the study team. They said that the construction work is going on right now and that's why they have kept it shut. However, during Covid time many lives were saved due to the oxygen supply of this plant. It was difficult to ascertain that how much it catered to Covid patients or the other disease patients.

The doctors suggested that the plant has been a big help and has successfully been dealing with its maintenance too. They hoped that the state government will soon hire AMC agency which would cover PSA plant too.

Earlier they had to depend on the LMO and oxygen cylinders but now they have alternatives like plants provided by IOCL. Many doctors were quite appreciative of the CSR intervention as it saved the lives of many Covid victims and helped other patients too.

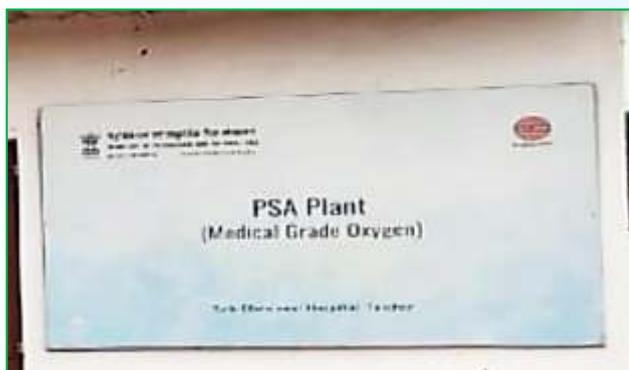
## Chapter -13

### 13.1 Sub Divisional Hospital, Angul, Odisha

#### A General Information

Talcher is a small sub divisional Hospital located in Angul district of Odisha. But this Hospital is strategically located and caters valuable health services to areas of adjoining districts of parts of Kyonjhar and Sambalpur too.

**PSA TALCHER**



This PSA Plant (GO 960 model) was installed and commissioned in August 2021 at the cost of Rs 94,40,000 and the same was handed over to sub divisional Hospital at Talcher immediately after installation. The plant has been operational and supplying oxygen ever since.

At the time of installation, the working pressure of PSA plant was 4.3 bar and oxygen purity of 94%. The committed oxygen purity is 90% to 96% as per Trident Pneumatics.

The contract for installation was given to M/s Trident Pneumatics (TP) a company which has installed PSA type oxygen generator plant in the Hospitals across many districts of the Odisha State.

#### B OPERATION AND MAINTENANCE

Among all the Hospitals in the Impact study this is the only plant that was located at a sub divisional level as all other plans of CSR initiative were located at the district level. Therefore, its maintenance became all the more a serious issue. When the demand is high the plant becomes quite helpful in saving lives of the people. The supply of the oxygen is continuous when it is in on condition but occasionally the plant is shut down when the demand is very low and when there is power cuts. They used the plant more when it was new and under warranty and a lot of patients benefitted from it. After the expiry of its warranty the Hospital started maintaining it.

At the time of visit the plant was operational but they kept it off as there was no requirement

for oxygen by any patient.

This is not a big Hospital and the doctors were quite appreciative about the fact that the IOCL thought of this initiative in such a remote area. They praised IOCL for considering remote areas for CSR intervention and being sensitive enough to reach out to them for the supply of oxygen.

One person is deployed for its maintenance. The plant is fully automatic and therefore it hardly needs any assistance in its operation. It is only required to monitor the purity and flow of the oxygen generated. The plant has a provision for tripping automatically, if the purity goes down the desired level.

## C Output

Like all other plants this plant too had a capacity of 960 LPM. The study team reported that the purity at the time of visit was 93-95 but at times. It provides oxygen to 45 to 55 patients on a normal day. As per doctors' estimate during Covid time around 80 to 85 patients were given oxygen per day.

### 13.2 The Beneficiary perspective

The patient who received the oxygen from the Hospital during Covid days and also the following days is the beneficiary of this intervention.

Perspective of beneficiaries is important to understand the impact of the PSA plant and therefore they were interviewed to capture the perception about efficacy of the oxygen supply during their stay in the Hospitals. The patients of Covid days did not wish to recall the time and it took some efforts to take feedback from them. In the Covid time when the plant was a great support to meet the demand and provided timely help by supplying oxygen to many Covid patients. Beneficiaries though were not aware where from and with what efforts they were supplied oxygen to; they were appreciative of the services provided including the timely supply of the oxygen.

Tables given below provide some insight into the level of services given and timely help in the form of supply of oxygen reaching the patients.

City Name	Hospital Name	Table.146: Is the respondent a beneficiary or he is an attendant					
		Beneficiary		Beneficiary's Attendant		Overall	
		Count	%	Count	%	Count	%
JHARSUGUDA/ANGUL	SUB DIVISIONAL HOSPITAL TALCHER	4	80%	1	20%	5	100%

Four out of five patients themselves were the respondents and in one case it was the attendant that provided the feedback.

City Name	Hospital Name	Table.147: Gender of Respondent							
		Male		Female		Other		Total	
		Count	%	Count	%	Count	%	Count	%
JHARSUGUDA/ANGUL	SUB DIVISIONAL HOSPITAL TALCHER	5	100%	0	0%	5	100%	5	100%

All five respondents were male.

City Name	Hospital Name	Table.148: Social Category							
		Gen		OBC		SC/ST		Total	
		Count	%	Count	%	Count	%	Count	%
JHARSUGUDA/ANGUL	SUB DIVISIONAL HOSPITAL TALCHER	5	100%	0	0%	0	0%	5	100%

All of the respondents were from general category.

City Name	Hospital Name	Table.149: Was the oxygen provided on time					
		Yes		No		Total	
		No	%	No	%	No	%
JHARSUGUDA/ANGUL	SUB DIVISIONAL HOSPITAL TALCHER	5	100%	0	0%	5	100%

All respondents said that they had received oxygen on time.

City Name	Hospital Name	Table.150: What was the reason for Hospitalization?					
		Covid 19 infected		Other diseases		Total	
		Count	%	Count	%	Count	%
JHARSUGUDA/ANGUL	SUB DIVISIONAL HOSPITAL TALCHER	5	100%	0	0%	5	100%

City Name	Hospital Name	Table.151: What was the duration of Hospitalization? (In Days)									
		4d		5d		7d		8d		Total	
		Count	%	Count	%	Count	%	Count	%	Count	%
JHARSUGUDA/ANGUL	SUB DIVISIONAL HOSPITAL TALCHER	1	20%	1	20%	1	20%	2	40%	5	100%

The minimum Hospitalization was for 4 days and the maximum for 8 days. Two were Hospitalized for 8days.

City Name	Hospital Name	Table.152: Was Oxygen supply free or chargeable							
		Free		Chargeable		Don't remember/Can't Say		Total	
		No	%	No	%	No	%	No	%
JHARSUGUDA/ANGUL	SUB DIVISIONAL HOSPITAL TALCHER	4	80%	0	0%	1	20%	5	100%

Four of the respondents said the Oxygen Supply was all free and the one failed to recall.

City Name	Hospital Name	Table.153: Did the Oxygen supply help patient recover from the Covid 19 or the patient yet succumbed to it?							
		Yes patient recovered from Covid 19		No the patient succumbed to it		Patient was provided oxygen for some other disease		Total	
		Count	%	Count	%	Count	%	Count	%
JHARSUGUDA/ANGUL	SUB DIVISIONAL HOSPITAL TALCHER	5	100%	0	0%	0	0%	5	100%

All five beneficiaries recovered from the Covid infection after receiving oxygen.

City Name	Hospital Name	Table.154: Do you think that the supply of oxygen was adequate							
		Yes Adequate		No, Adequate		Can't Say		Total	
		Count	%	Count	%	Count	%	Count	%
JHARSUGUDA/ANGUL	SUB DIVISIONAL HOSPITAL TALCHER	5	100%	0	0%	0	0%	5	100%

The oxygen was reportedly adequate as all five respondents affirmed the same.

City Name	Hospital Name	Table.155: Which documents can you show to verify that the patient was admitted to the Hospital for the Covid19 treatment? (Admission slip)							
		Yes		No		Doc. Seen		Total	
		Count	%	Count	%	Count	%	Count	%
JHARSUGUDA/ANGUL	SUB DIVISIONAL HOSPITAL TALCHER	5	100%	0	0%	0	0%	5	100%

All claimed to have admission slips but none could show it to the study team.

City Name	Hospital Name	Table.156: Which documents can you show to verify that the patient was admitted to the Hospital for the Covid 19 treatment? (Discharge slip)							
		Yes		No		Doc. Seen		Total	
		Count	%	Count	%	Count	%	Count	%
JHARSUGUDA/ANGUL	SUB DIVISIONAL HOSPITAL TALCHER	5	0%	0	0%	0	0%	5	100%

All claimed to have discharge slips but none could show it to the study team.

City Name	Hospital Name	Table.157: Which documents can you show to verify that the patient was admitted to the Hospital for the Covid 19 treatment? (Medicine prescription of the Hospital)							
		Yes		No		Doc. Seen		Total	
		Count	%	Count	%	Count	%	Count	%
JHARSUGUDA/ANGUL	SUB DIVISIONAL HOSPITAL TALCHER	5	0%	0	0%	0	0%	5	100%

The five respondents said they have medicine prescriptions too but not with them and therefore could not show for the verification.

City Name	Hospital Name	Table.158: Which documents can you show to verify that the patient was admitted to the Hospital for the Covid 19 treatment? (Covid 19 report of the Hospital)							
		Yes		No		Doc. Seen		Total	
		Count	%	Count	%	Count	%	Count	%
JHARSUGUDA/ANGUL	SUB DIVISIONAL HOSPITAL TALCHER	3	60%	2	40%	0	0%	5	100%

When asked whether they have Covid test report they said yes they had not available with them.

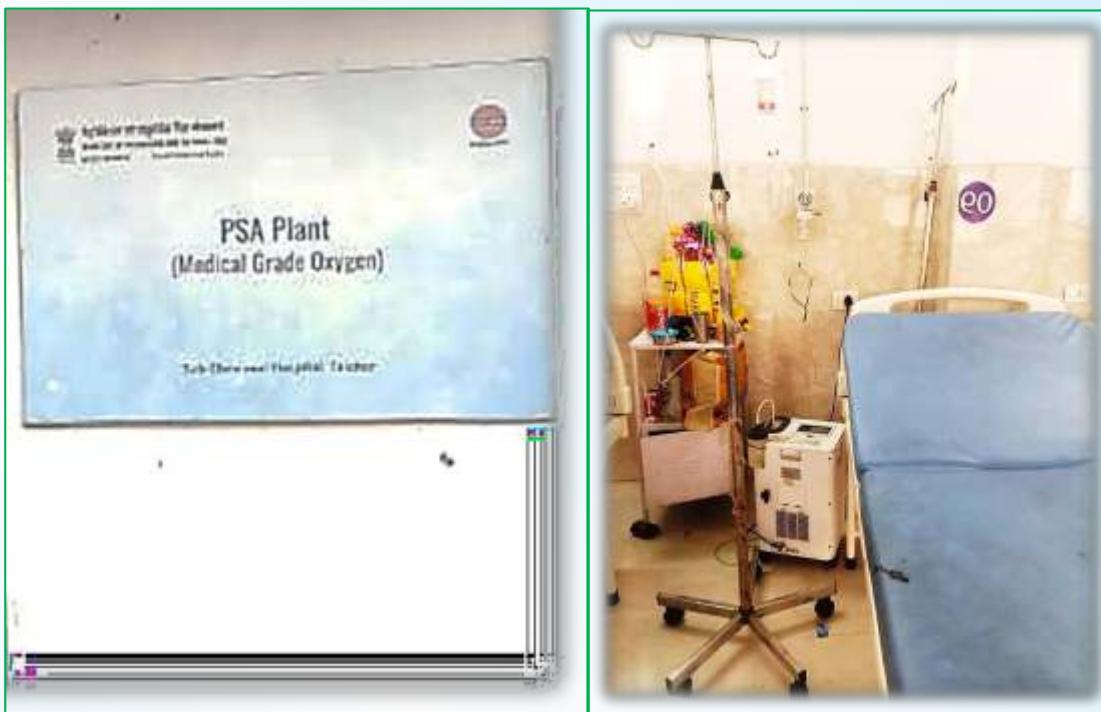
City Name	Hospital Name	Table.159: Did you get the treatment as BPL category							
		Yes		No		Total			
		Count	%	Count	%	Count	%	Count	%
JHARSUGUDA/ANGUL	SUB DIVISIONAL HOSPITAL TALCHER	0	0%	5	100%	5	100%		

None of them were from BPL category.

City Name	Hospital Name	Table.160: Overall Are you satisfied with the supply of the oxygen by the Hospital							
		Satisfied		Not Satisfied		Can't Say		Total	
		Count	%	Count	%	Count	%	Count	%
JHARSUGUDA/ANGUL	SUB DIVISIONAL HOSPITAL TALCHER	5	100%	0	0%	0	0%	5	100%

All five respondents were satisfied with the supply of the oxygen. Sub Divisional Hospital waiting hall

## Sub Divisional Hospital Drug Distribution Center



### 13.3 The Doctor's Perspective

The doctors said that the plant has been a big help. They were all appreciative about the initiative and seemed too happy with the IOCL to think about this area for the CSR initiative.

This clearly shows that the CSR initiative of installing the plant in remote areas like this has been quite an exemplary effort. Without such efforts it would have been difficult to provide oxygen to patients easily. At the same time the initiative was also taken in Puri where it could cater to many people as there was heavy demand there. So it was all about striking a balance between the remoteness and magnitude of demand at the same time and IOCL did very well on both fronts.

Not much before the Hospitals were solely dependent on LMO and oxygen cylinders but now they have alternatives like plants provided under the IOCL CSR initiatives. The doctors were quite appreciative of the CSR intervention as it saved the lives of many Covid victims and helped other patients too.

## Way Forward (Project 2)

More such plants should be brought in to replace LMOs tanks and oxygen cylinders, the traditional and old system of oxygen supply. The loss of oxygen makes its expensive in the longer term.

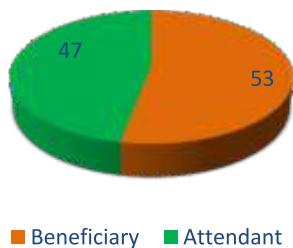
The purity of the oxygen is given as between 90 to 96 for all plants in the survey, which is good enough for all types of adult patients. Some doctors pointed out that in case of a child patient they prefer LMO tanks oxygen as its purity is a little better and can manually be controlled. In case of power cuts the supply remains uninterrupted as it is not dependent on power supply. Therefore, both types of supply should be there. The PSA plant has its own advantages and the LMO tanks have its own.

It is also recommended that when such plants are bought by IOCL the purchase should be arranged in such a way that the Hospital where it is installed should become its customer. This would help the Hospital to seek the services of the manufacturer under warranty easily. In the present case the Hospital had to write to IOCL to secure the services under warranty as technically the IOCL was its customer.

## Gist of the CSR Impact Assessment - All Hospitals

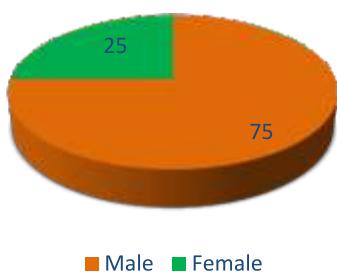
Here is overall assessment (across all hospitals) depicted through graphics:

**Chart : 1 Is the respondent a beneficiary or he is an attendant (In %)**



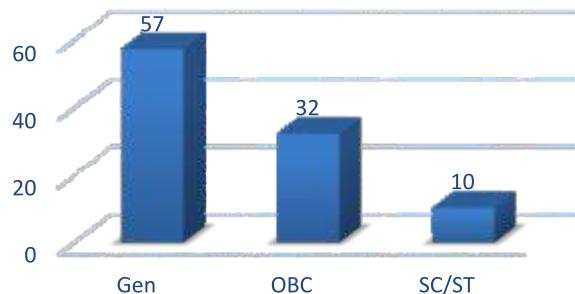
More than half of the respondents were beneficiaries themselves whereas in 47% cases the help of attendants were taken to collect the feedback.

**Chart :2 Gender of Respondent (In %)**



Of all Interviewed three-fourth were male and one-fourth were female.

**Chart: 3 Social Category (In %)**



Of all the beneficiaries fifty seven percent were from general categories whereas 33% come from OBC and the remaining 10% belong to SC/ST.

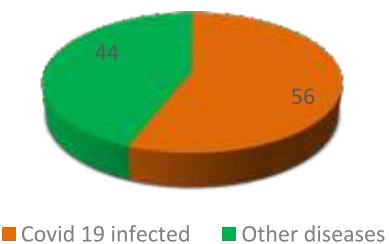


**Chart: 4 Was the oxygen provided on time (In %)**



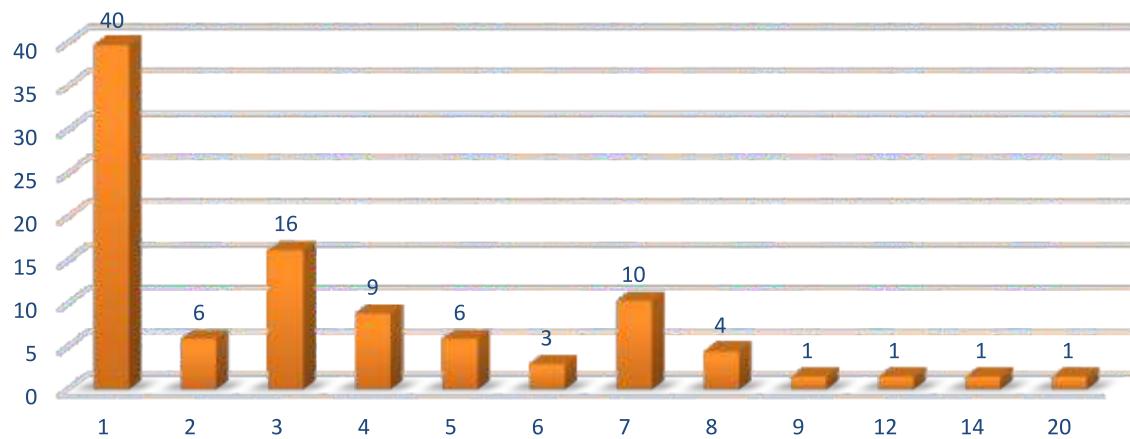
A Whopping 99% respondent said that the Oxygen was provided on time. This underlines the tremendous success of the plants during Covid times .The remaining 1% said that they did not know or had no idea about it.

**Chart : 5 What was the reason for hospitalization? (In %)**



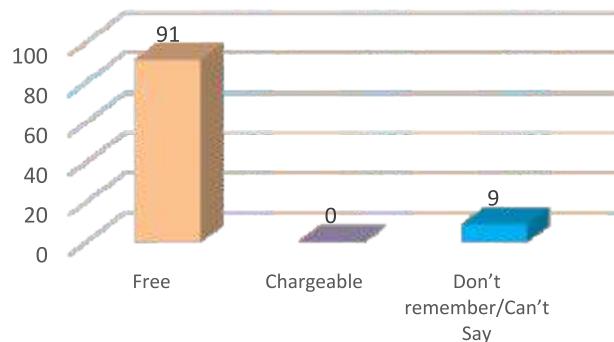
56% of the beneficiaries were Covid infected where as 44% were hospitalized for other diseases.

**Chart : 6 What was the duration of Hospitalization (In Days)? (In %)**



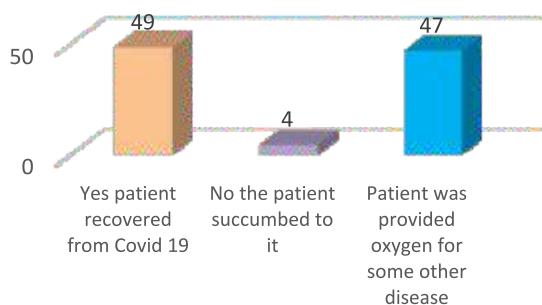
The maximum hospitalization was for 40 days where as the minimum was for a day only.

**Chart : 7 Was Oxygen supply free or chargeable (In %)**



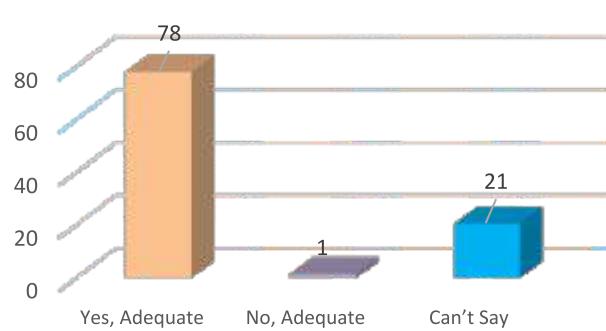
91 % of the respondents said that the oxygen supply was free. Nine percent said that they had no idea whether it was free or chargeable.

**Chart : 8 Did the Oxygen supply help patient recover from the Covid 19 or the patient yet succumbed to it? (In %)**



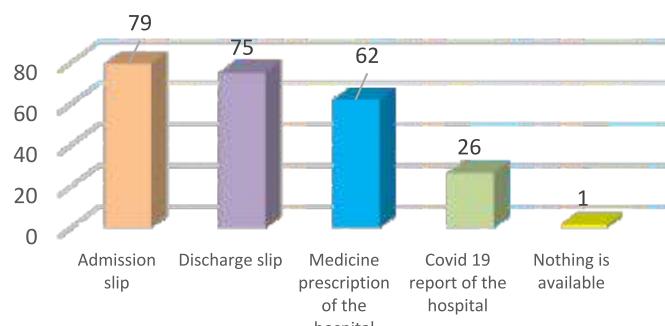
96 percent of the patients who were given oxygen recovered from Covid or the other ailments whereas only 4% succumbed to it. This goes to show that the oxygen supply by the plant saved many invaluable lives.

**Chart : 9 Do you think that the supply of oxygen was adequate (In %)**



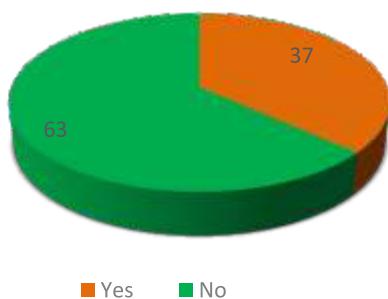
As high as 78% of the respondents said that the supply was adequate where as 21% of the respondents said that they do not remember and are in a no position to answer this. In doctors perception it was 100% adequate and there was no dearth of oxygen supply. This also points to a tremendous success of the project.

**Chart : 10 Which documents can you show to verify that the patient was admitted to the hospital for the Covid 19 treatment? (Yes In %)**



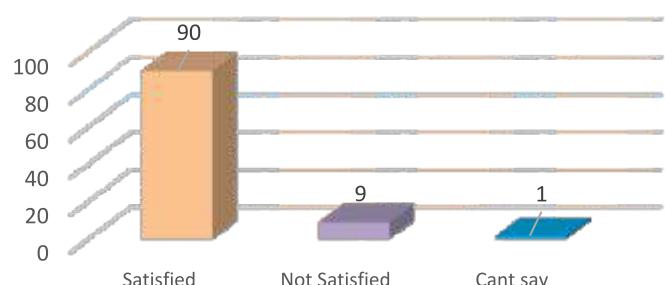
Around three-fourth (75%) of the respondents said that they have admission slip (79%) or discharge slip (75%) to show that they were hospitalized for the Covid 19 treatment. 62% said that they have Medicine prescription of the hospital to show the same. 26% claimed that they have Covid report with them but most of them could not show them for verification as they got misplaced after such a long time.

**Chart : 11 Did you get the treatment as BPL category (In%)**



A significant proportion of the respondents (37%) said that they got treatment as BPL category. This again points to needy ones getting oxygen in hospitals during Covid time.

**Chart : 12 Overall Are you satisfied with the supply of the oxygen by the hospital (In %)**



A whopping 90% of the respondents were reported overall satisfied with the supply of the Oxygen. This clearly shows that the project was a huge success and the CSR initiative of the IOCL was a commendable one.

# Annexures

## BENEFICIARY QUESTIONNARE/ Indian Oil Company (R&D) Faridabad

### Section-1

#### General Information (Interview only that patient who was provided oxygen or his Attendant)

Respondent ID		Date of Interview	D	D	M	M	Y	Y	Y	Y
101	State name	102 District name								
103	CITY NAME	104 Hospital name and Address								

### Section-2

201	Beneficiary Name Mobile no.at the time of Hospitalization	Name - Mobile No. -								
202	Is the respondent a beneficiary or he is an attendant	1. Beneficiary 2. Attendant								
203	Age of respondent (IN COMPLETED YEARS)									
204	Gender of Respondent	Male Female Other								
205	Domicile State	State Name -								
206	Social Category	Gen OBC SC/ST								
207	Date of Hospitalization	D	D	M	M	Y	Y	Y	Y	
208	Date of discharge	D	D	M	M	Y	Y	Y	Y	
209	Date on which oxygen was required	D	D	M	M	Y	Y	Y	Y	
210	Date on which oxygen was given	D	D	M	M	Y	Y	Y	Y	
210a	Was the oxygen provided on time	Yes -1 No-2								
211	If No in Q 209 then ask about the delayed time	One day Two days More than two days								
212	What was the reason for Hospitalization?	Covid 19 infected Other diseases								
213	What was the duration of Hospitalization?	No. of days _____								

214	Number of hours, days for which the oxygen was given to the patient	Hours _____ Days _____			
215	Was Oxygen supply free or chargeable	1. Free 2. Chargeable 3. Don't remember/Can't Say			
216	If chargeable, what was the charge of the oxygen provided	Amount _____			
217	Did the Oxygen supply help patient recover from the Covid 19 or the patient yet succumbed to it?	1. Yes patient recovered from Covid 19 2. No the patient succumbed to it 3. Patient was provided oxygen for some other disease			
218	Do you think that the supply of oxygen was adequate	1. Yes Adequate 2. No, Adequate 3. Can't Say			
219	Which documents can you show to verify that the patient was admitted to the Hospital for the Covid 19 treatment? <i>(Investigator: please see the documents)</i>	Documents	Yes	No	Doc. Seen
		Admission slip	1	2	
		Discharge slip	1	2	3
		Medicine prescription of the Hospital	1	2	3
		Covid 19 report of the Hospital	1	2	3
Nothing is available	1	2	3		
220	Did you get the treatment as BPL category	Yes-1 No-2			
221	If yes, Was the oxygen supply was free?	Yes-1 No-2			
222	If the BPL patient was charged then how much he was charged	Amount _____			
223	Overall Are you satisfied with the supply of the oxygen by the Hospital	1. Satisfied 2. Not Satisfied 3. Can't Say			

**Remark by Investigator-**

**Beneficiary Matched – Yes – 1,      No - 2**

**Name & Signature of Investigator**

## Key Functionary 5 TPD BIO GAS PLANT Indian Oil Company (R&D) Faridabad

IOCL Officials		
Name _____	Designation _____	
Contact No	_____	
Month/Year when you get associated with the project	_____	
Month/Year till you stayed associated with	_____	
At what stage you got associated with the project	_____	
1. Installation	2. Operation	3. Production

Section-1				
101	Did the Plant produce gas all three reference years (2019-20, 20-21, 21-22)	2019-2020	Yes -1	No-2
		2020-2021	Yes -1	No-2
		2021-2022	Yes -1	No-2
102	Did the plant get the waste from MCF (Municipal Corporation Faridabad)	2019-2020	Yes -1	No-2
		2020-2021	Yes -1	No-2
		2021-2021	Yes -1	No-2
103	Did the plant get the waste on time	1. Always 3. Seldom 5. Not aware	2. Mostly 4. Never	_____
104	According to you What quantity plant averagely received waste per day	_____		
105	According to you What quantity plant averagely produced gas per day	_____		
106	Do you think plant was sufficiently manned to operate it	1. Yes Adequate 2. No, not adequate		_____
107	Do you think that waste received by plant was adequate for 5T gas production per day	1. Yes 2. No		_____
108	Overall how do rate the success of the plant	1. Good    2. Average    3. Poor		_____
109	What bottlenecks/obstacles did you notice in its functioning	1 2 3		_____
110	Your Suggestions for improvement	1 2 3		_____

**Section 2 MCF Section**

201	Was the waste supplied to the plant	1. Yes      2. No	
202	Year when the supply of waste began		
203	What quantity of waste was supplied per day		
204	Was the supply of waste to the plant on time	1. Yes      2. No	
205	What average amount of waste is collected per day		
206	What Operational difficulty did you observe in the supply of the waste		
207	Bottlenecks/Obstacles observed by you	1 2 3	
208	Suggestions for the improvement	1 2 3	

**Section 3 Plant Operators**

301	Name										
302	Designation with mobile number										
303	Responsibility in the project										
304	Was waste received from MCF	1. Yes      2. No									
305	Average per day received										
306	What amount of waste was received	2019-20 _____ 2020-21 _____ 2021-2022 _____									
307	How many hours plant worked per day										
308	Did you face any problem in receiving the waste or operating the plant	1. Yes      2. No									
309	Reason for the problem (describe in detail)										
210	Give your experience with the operation of the plant (in detail)										
	Suggestions										

**Name & Signature of Investigator**

## Key Functionary/CMO/Duty Doctor/Oxygen Schedule

### Indian Oil Company (R&D) Faridabad

**Section-1 General Information In-depth interview of the doctor or the CMO or the functionary involved with supply of the oxygen to Hospital and then to end user, the patient)**

Respondent ID		Date of Interview	
101	State name	102 District name	
103	CITY NAME	104 Hospital name and Address	

### Section-2

201	Name and Mobile no of the respondent/functionary	<b>Name -</b> <b>Mobile No. -</b> <input type="text"/>		
202	Is the respondent a doctor or the other key functionary	1. Doctor/duty doctor/CMO (Doctor) <input type="checkbox"/> 2. Key Functionary (Stock keeper) <input type="checkbox"/>		
<b>Doctor/CMO/Duty doctor</b>				
203	Did the IOCL CSR project of oxygen supply to the Hospital continued for all three reference years (2019-20, 20-21, 21-22)	<b>2019-2020</b> <input type="checkbox"/>	<b>Yes -1</b>	<b>No-2</b>
		<b>2020-2021</b> <input type="checkbox"/>	<b>Yes -1</b>	<b>No-2</b>
		<b>2021-2022</b> <input type="checkbox"/>	<b>Yes -1</b>	<b>No-2</b>
204	Was the oxygen supplied to the patient during project period	1. Yes <input type="checkbox"/> 2. No <input type="checkbox"/>		
205	Was it chargeable or free	1. Free <input type="checkbox"/> 2. Chargeable <input type="checkbox"/>		
206	If chargeable what was charged	Amount <input type="text"/>		
207	Please give details of your experience with supplying oxygen to the patients and give your suggestions for improvement			
208	Do you think that Oxygen supply was adequate or Inadequate	3. Yes Adequate <input type="checkbox"/> 2 No, not adequate <input type="checkbox"/>		

209	In your assessment what amount of oxygen was supplied to the patients during the three years		
210	Was the oxygen provided on time to the patient	Yes-1	No-2
211	If No in Q 209 the reason for delay in supplying oxygen to the patient	1. Not available	
		2. Available but the demand was high	
		3. Problem in supply chain	

**Key Functionary (Stock keeper or supply chain head within or outside Hospitals )**

	Name												
212	Designation with mobile number												
213	Responsibility in the project												
214	What amount of oxygen was supplied to the Hospital	2019-20 _____ 2020-21 _____ 2021-2022 _____											
215	If chargeable, what was the charge of the oxygen provided	<b>Amount</b> _____											
216	Did you face any problem in the supply chain of the Oxygen	Yes-1	No-2										
217	Reason for the problem (describe in detail )												
218	Give your experience with the supply of oxygen to the Hospital and also give your valuable suggestions for improvement												

**Name & Signature of Investigator**



# Thank you