

Minutes of the Meeting of Oxygen Audit Sub-Group of Assam held through Webinar at 3.00 PM on 05/06/2021

Member present:

1. Dr. Minaz Alam, IAS, Joint Secretary, Ministry of Food Processing Industry, Government of India.
2. Dr. M.I.Z Ansari, IPES, Deputy CEE, PESO, Guwahati.
3. Smti Pranati Majumdar, ACS, Joint Secretary, Health & FW Deptt. Government of Assam.
4. Sri Dhruba Bora, ACS, Joint Secretary, Government of Assam.
5. Dr. Faiza Ahmed Talukdar, Prof of Anesthesiology, Guwahati Medical College & Hospital, Guwahati.
6. Dr. Priyam Saikia, Professor of Anesthesiology, Guwahati Medical College & Hospital, Guwahati.

The second meeting of the duly notified Oxygen Audit Sub-Group was held through a webinar.

Accordingly, the discussions taken in the last webinar meeting & action taken report were placed and read out before the Committee.

The system of Web-based monitoring which is currently under development under the Command & Control Centre, NHM, shall be expedited and rolled out for monitoring of parameter like requirement, availability, and consumption across the state.

As per minutes of the last meeting all the members were apprised regarding the formation of District Level Oxygen Audit Sub-Group.

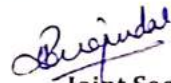
In today's meeting the draft SOP for oxygen monitoring system has been presented before the Hon'ble members.

A few modifications suggested to be included in the SOP, has been accepted by all.

It was pointed out that reporting of oxygen consumption & availability by some of the Medical College authorities of Assam are not done regularly as required. The data provided by Medical College authorities & other hospital authorities needs to be provided to Government of India by the PESO officials and accordingly such hospital authorities will submit timely data as and when required without fail.

The SOP prepared along with the Annexure will be circulated to all the members for acceptance after which it will be presented before the Government to be issued as an order.

The Audit Sub-Group decided to meet again next week along with a decision to invite a few district/ Medical Colleges to join in the meeting through webinar regarding Oxygen Audit in the District/ Medical College Hospitals.

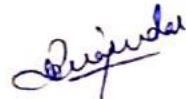


**Joint Secretary,
Health & F.W Department, Govt. of Assam
Dated Dispur the 7th June, 2021**

Memo No. HLA.475/2021/17-A

Copy to:

1. The Principal Secretary, O/o the Hon'ble Chief Minister, Dispur.
2. The Principal Secretary, Health & F.W Department, Govt. of Assam
3. SO to Chief Secretary, Dispur, Assam.
4. The Mission Director, National Health Mission, Assam, Christianbasti, Guwahati.
5. The Deputy Commissioner (All District).
6. The Director of medical Education, Assam, Sixmile, Guwahati.
7. The Director of Health Services, Assam, Hengrabari, Guwahati-36.
8. The Director of Health Services (FW), Assam, Hengrabari, Guwahati-36.
9. The Principal-cum-Chief Superintendent all Medical Colleges of Assam.
10. The Superintendent of all Medical Colleges.
11. The Joint Director of Health Services (All district).
12. P.S to Hon'ble Health Minister, Assam.
13. All Members.



**Joint Secretary,
Health & F.W Department, Govt. of Assam**

GOVERNMENT OF ASSAM
HEALTH & FAMILY WELFARE (A) DEPARTMENT
DISPUR, GUWAHATI – 781006

No. HLA.475/2021/18

Dated Dispur the 9th June, 2021.

ORDER

SOP FOR ENSURING AVAILABILITY OF MEDICAL OXYGEN IN ASSAM

The rationale of this document is to cover all aspects of oxygen availability and its augmentation of production, transportation, need-based distribution, monitoring consumption, coping with shortage, prevention of wastage, and accountability of all stakeholders in the system of medical oxygen management in Assam.

Availability of medical oxygen:

- 1.1. The manufacturers of oxygen in the state shall strive toward to achieve productivity to the optimum level of their installed capacities. Till Covid situation improves, production shall not be diverted for industrial use, except for those industries which are exempted. **(A list of Production Units of Oxygen in the state - Both gaseous and liquid medical oxygen- attached as Annexure-I)**
- 1.2. The manufacturers of oxygen shall ensure deployment of sufficient manpower in their installations.
- 1.3. The Power Department shall ensure uninterrupted power supply to the oxygen manufacturing units.
- 1.4. Transport Department shall facilitate free movement of all the tankers engaged in transportation of Gaseous or Liquid Medical Oxygen. **(A list of tankers engaged in Oxygen transport attached as Annexure II).**
- 1.5. All hospitals having a total bed capacity of 30 or more, both in the Government and private sector shall strive to be self-sufficient for supply of oxygen through installation of Oxygen Generation Plants (OGP), Medical Gas Pipeline System (MGPS) and a manifold system with cylinder back-up. **(A list of such hospitals with 30 or more beds, district wise in Government sector is attached as Annexure III).**

2. Assessment of requirement of medical oxygen:

- 2.1. All Hospitals shall have a notified Nodal Officer (Superintendent/Addl Superintendent of the Hospital by default) for Oxygen who shall be responsible for ensuring medical oxygen in the hospital.
- 2.2. For supply of medial oxygen to his institution, the Nodal Officer shall coordinate with the fillers of oxygen/suppliers of LMO, pre-designated to his district by the State Nodal Officer.
- 2.3. All hospitals shall designate staff (not below the rank of GNM) for continuous monitoring of oxygen availability and requirement, and also for functioning of manifold room and use of cylinders, operation and maintenance of Oxygen Generator Plants, and Liquid Medical Oxygen system etc.

- 2.4. Where oxygen cylinders are used for medical oxygen supply, the Nodal Officer of the hospital shall determine the requirement of number of cylinders based on number of oxygen beds (including oxygen supported beds & ICU beds), considering all aspects of requisite flow of oxygen per minute, distance of the re-filler & transportation time. ***(The model calculation plan for Medical Oxygen requirement is given as Annexure IV)***
- 2.5. Where LMO and Oxygen Generation Plants are used, such systems shall be used along with a manifold system with a backup of requisite number of D-type cylinders so that whenever the pressure in the supply system from LMO/Oxygen Generator Plant drops, the manifold system with the back-up cylinders shall be used.
- 2.6. Hospitals shall inform about the quantity of LMO/ Cylinders required and place indents/order with the supplier designated for the district well in advance so as to have sufficient time in hand before the LMO vessel/cylinder manifold runs dry.
- 2.7. Taking into consideration the number of manufacturers/suppliers of medical oxygen in the state, all hospitals, both Government and the Private sectors, other than those hospitals having rate contract with a particular vendor/supplier, shall have a clearly identified vendor/supplier of Medical Oxygen.
- 2.8. The vendors/suppliers of LMO/filled oxygen cylinders shall maintain sufficient number of transportation vehicles.
- 2.9. For hospitals where the filler is at a considerable distance, planning shall be done taking into consideration the distance, filling and loading time and exchanging time at manifold to determine the minimum number of D-type cylinders to be earmarked for the hospital.
- 3. Accountability of all stakeholders:**
- 3.1. The dealers of LMO shall ensure that sufficient quantity of LMO is available in the state by bringing in the Government of India allocated quantity of LMO from outside the state. For any issues, the dealers shall approach the SNO Oxygen Assam.
- 3.2. For LMO system, the suppliers/vendors of medical oxygen shall ensure regular maintenance of the cryogenic vessels, vapourizers, instruments, valves and safety devices etc for safe operation of the facility. Only qualified & experienced persons shall be deployed for decantation of LMO tanker and shall ensure that all operations are being done as per requisite norms.
- 3.3. In case of any leakage/blockage/disruption in flow of oxygen in the oxygen supply system from the manifold & cylinder system/Oxygen Generator Plant system/ LMO system, the Hospital Nodal officer will immediately inform the Hospital authorities and the District Nodal officer Oxygen, who in turn will, if the need arises, escalate the matter to the State Nodal Officer.
- 3.4. All such operators (Gas and liquid Medical Oxygen plants) including govt and private institutions shall maintain a list of emergency contact numbers in case

of a situation leading to stoppage of production or even manmade/natural disasters.

- 3.5. All cylinder fillers shall ensure that 'test due' and spurious cylinders shall not be filled. Cylinders shall not be subjected to pressure more than their designated pressure.
- 3.6. SOP issue by PESO for conversion of non-oxygen cylinders to medical oxygen cylinders shall be strictly adhered to.
- 3.7. LMO/cylinder suppliers shall share the details of LMO tankers/cylinder trucks including driver mobile phone numbers with the Hospital authority/hospital Nodal Officer.
- 3.8. All hospitals shall have an internal oxygen audit committee to prevent misuse of medical oxygen. In the Government hospitals, the structure of the committee has been communicated from NHM Assam with Govt approval. The committee will conduct audit on oxygen to find out:
 - i. Whether excess oxygen is consumed than against the available number of ICU/ oxygen supported beds.
 - ii. Prevent misuse of gas and cylinders
 - iii. To check if there are any leakages, blockages etc in the pipeline/manifold system/LMO system/OGP system
 - iv. Whether required flow rate of oxygen is applied in accordance with MoH&FW and WHO guidelines.
 - v. Whether the valves dedicated to each oxygen bed are closed when oxygen supply is not in use.
 - vi. The above are illustrative only, not exhaustive.

The committee will conduct weekly audits and submit their signed reports to the Deputy Commissioner of the district and State Nodal Officer for oxygen without fail.

4. Monitoring availability of medical oxygen:

- 4.1. Mapping of Suppliers/vendors of medical oxygen to hospitals in the district level to be carried out by the Deputy Commissioners in the districts. If suppliers/dealers of medical oxygen are not available within the district, the nearest one in the next district shall be identified and tagged by the State Nodal Officer for Medical Oxygen.
- 4.2. Covid-19 control rooms opened at the district level shall be ensured to operate 24x7 basis. Nodal officers for oxygen shall be appointed at the District level to monitor status of demand and supply of medical oxygen, to liason with relevant stakeholders in order to ensure that patients do not face a shortage of oxygen in the hospitals. The details of the District level Nodal Officers for Oxygen shall be informed to the SNO and widely publicised so that people may contact them directly for any emergency.
- 4.3. District Nodal Officers for Oxygen will coordinate with State level officers responsible for monitoring and coordination at the state level.



- 4.4. Details of oxygen availability, both in the Government and private health sector should be monitored on a daily basis to ensure that there is no shortage of oxygen for patients in any part of the state. The Monitoring system shall be a web-based system, to be maintained by the Command & Control Centre, NHM Assam.
- 4.5. In the districts, the JE instruments, NHM shall be responsible to entering the daily data relating to the Government hospitals in the web based portal. The JE Instruments shall coordinate with the Government hospital Nodal Officers/authorities in the districts for authentic data to be provided. The District Nodal Officer for oxygen shall supervise and monitor the process of information flow from the district level to the state level.
- 4.6. The Private Hospitals shall be allocated login ID & password by the I/C Command & Control Centre, NHM Assam and such hospitals will provide daily data in the designated web-based system.
- 4.7. The Command & Control Centre, NHM will provide daily compiled reports to the authorities concerned and coordinate with the SNO, Oxygen on a regular basis for all follow measures to be taken.

(Anurag Goel, IAS)

Principal Secretary to the Govt. of Assam,
Health & Family Welfare Department
Dated Dispur the 9th June, 2021.

Memo No. HLA.475/2021/18 – A

Copy to:-

1. The Chief Secretary, Assam, Dispur.
2. Additional Chief Secretary, Home & Political/Social Welfare Department.
3. The Principal Secretary to Hon'ble Chief Minister, Assam.
4. The Chief Executive Officer Assam State Disaster Management Authority.
5. The Mission Director, National Health Mission, Assam, Guwahati-5.
6. The Deputy Commissioner/ Sub-Divisional Officer (all districts).
7. The Superintendent of Police (all district).
8. The Director of Health Services, Assam, Hengerabari, Guwahati-36.
9. The Director of Health Services (FW), Assam, Hengerabari, Guwahati-36.
10. The Director of Medical Education, Assam, Sixmile, Khanapara, Guwahati-22.
11. The Commissioner, Gauhati Municipal Corporation/EO, Municipality Boards (all)
12. The Principal-cum-Chief Superintendent all Medical Colleges of Assam.
13. The Superintendent all Medical College & Hospital, Assam.
14. The Joint Director of Health Services (all districts).
15. All Superintendent of District Hospital
16. The SO to Chief Secretary, Assam, Dispur, Guwahati-6.
17. PS to Hon'ble Minister, Health & Family Welfare, Assam, Dispur.
18. Members Concerned..... By order etc.,

Pragjyoti
9/6/21

Joint Secretary to the Govt. of Assam,
Health & Family Welfare Department,

Annexure I

List of Production Units of Oxygen in the state.

Sl. No	Name of manufacturer	Contact number	Production system	Distribution network available in districts	Installed Production capacity per day
1	M/s. Premier Cryogenics Ltd / M/s. Assam Air Products, Guwahati	Mr. Abhijit Borooah, MD: 9864023874 Mr. Mamud Ahmed: 9435155525 Mr. P.K.Bora 9435046733	Liquid Medical Oxygen (LMO). Re-filler of cylinders. Also supplies LMO out of own production and brought from outside Assam.	Kamrup Metro, Barpeta, Nagaon, Bongaigaon, Sivasagar, Cachar, Lakhimpur, Dhemaji, Sonitpur, Golaghat, Hailakandi, Goalpara, Dhubri, Jorhat, Dibrugarh, Tinsukia, Hojai, Biswanath.	48.91 MT
2	M/s. Meghalaya Oxygen Pvt Ltd, Amingaon, Kamrup Rural	Mr. Pravin Jain 9401010101 Mr. Gautam Hazarika: 9854165494	Air Separation Unit (ASU). Re-filler of cylinders , also supplies LMO brought from outside Assam	Kamrup Rural, also supplies directly to hospitals in the districts of Nalbari and Barpeta.	7.71 MT
3	M/s. Himalayan Air Products, Dibrugarh	Mr. Basant Agarwala: 9435031859 Mr. Monoj Chetri: 9706776513; 7727825563	Air Separation Unit (ASU). Re-filler of cylinders , also supplies LMO brought from outside Assam	Dibrugarh	3.11 MT
4	M/s. Santinath Air Products, Silchar	Mr. Rahul Sethi: 9007744666	Air Separation Unit (ASU). Re-filler of cylinders	Cachar, also supplies directly to hospitals in the districts of Hailakandi and Karimganj	3.89
5	M/s. North-East Gases, Bongaigaon	Mr. Dubey: 9435022463	Air Separation Unit (ASU). Re-filler of cylinders	Bongaigaon, Chirang	3.12 MT
6	M/s. Luit Aero Products, Silapathar, Dhemaji	Mr. Rupam Phukan: 9435804997	Air Separation Unit (ASU). Re-filler of cylinders	Dhemaji, Lakhimpur	3.6

Annexure – II

List of tankers engaged in transport of Liquid Medical Oxygen

SR NO	Name & Address (Correspondence)	Registration No, Engine No, Chasis No	Gas Name	Apprx. Capacity (MT)
1	M/s. Assam Air Products Pvt. Ltd. Maniram Dewan Road, Chandmari, Guwahati (M. Corp.), KAMRUP (METRO), Pin : 781003	AS-01 AC5212, 697TC55MTZ160234, 373344MTZ147140	LIQ. Oxygen	5.75
2	M/s. Premier Cryogenics Ltd Chandmari GUWAHATI, GUWAHATI, Chandmari, KAMRUP (METRO), Pin : 781003	AS-01 DD6362, 11F63151229, MAT466386B5G12110	LIQ. Oxygen	16.07
3	M/s. Assam Air Products Pvt Ltd GUWAHATI, Maniram Dewan Road, Chandmari, GUWAHATI, KAMRUP (METRO), Pin : 781003	AS-01 CC7814, 01D62870876, MAT466401A2D10337	LIQ. Oxygen	14.9
4	M/s. PREMIER CRYOGENICS LIMITED Lokhra Road, Saukuchi, GUWAHATI, KAMRUP, Pin : 781040	AS-01 GC5424, 51F63451144, MAT466407F1615500	LIQ. Oxygen	15.5
5	M/s. PREMIER CRYOGENICS LIMITED Lokhra Road, Saukuchi, Guwahati, KAMRUP, Pin : 781040	AS-01 GC5423, 51F63447232, MAT466407F1615375	LIQ.Oxygen	15.5
6	ASSAM AIR PRODUCTS PVT LTD MANIRAM DEWAN ROAD CHANDMARI, GUWAHATI, GOLAGHAT, Pin : 781003	AS-01 HC9136, b591803261L63558402, mat541006g1n25692	LIQ. Oxygen	19.15
7	ASSAM AIR PRODUCTS PVT LTD MANIRAM DEWAN ROAD CHANDMARI, GUWAHATI, GOLAGHAT, Pin : 781003	AS-01 HC9135, B591803261L63558359, MAT541006G1N25690	LIQ. Oxygen	19.16
8	MEGHALAYA OXYGEN PVT LTD KOCHAR HOUSE, S.J. ROAD, ATHGAON, Golaghat, GOLAGHAT, Pin : 781001	NL-01 AA9007, 61M63561538, MAT448037H2A00045	LIQ. Oxygen	12.5
9	HIMALAYAN GAS INDUSTRIES INDUSTRIAL ESTATE, LAHOAL, P.O. BOKUL, Dibrugarh East, Dibrugarh East, DIBRUGARH, Pin : 786010	AS-06 BC4291, JGHZ405573, MB1NAKHD4JRGW1870	LIQ. Oxygen	18
10	Himalayan Air Products, Central Chowkidinghee, Radali Path, Dibrugarh, DIBRUGARH, Pin : 786001	AS-06 BC5800, isbe5.91804091c637730 22, mat466472k2c03883	LIQ. Oxygen	15.22
11	MEGHALAYA OXYGEN PVT LTD, KOCHAR HOUSE, S.J. ROAD, ATHGAON, Golaghat, GOLAGHAT, Pin : 781001	NL 01 AE 5476 MB1KJKHD8KPLL0397	LIQ. Oxygen	16.5
12	M/s. Premier Cryogenics Ltd Chandmari GUWAHATI, GUWAHATI, Chandmari, KAMRUP (METRO), Pin : 781003	AS 01 HC 1678 Chasis MAT466430G1G19289	LIQ.Oxygen (Converted from Liq. N2)	15.74
13	M/s. Premier Cryogenics Ltd Chandmari GUWAHATI, GUWAHATI, Chandmari, KAMRUP (METRO), Pin : 781003	AS 01 FC3395 Chasis MAT466403D3P22648	LIQ.Oxygen (Converted from Liq. N2)	15

14	M/s. Assam Air Products Pvt. Ltd. Maniram Dewan Road, Chandmari, Guwahati (M. Corp.), KAMRUP (METRO), Pin : 781003	AS01 FC3391 Chasis MAT466403D3P22551	LIQ.Oxygen (Converted from Liq. N2)	15
15	M/s. Premier Cryogenics Ltd Chandmari GUWAHATI, GUWAHATI, Chandmari, KAMRUP (METRO), Pin : 781003	AS01 FC3394 Chasis MAT466403D3P22624	LIQ.Oxygen (Converted from Liq. N2)	15
16	M/s. Assam Air Products Pvt Ltd GUWAHATI, Maniram Dewan Road, Chandmari, GUWAHATI, KAMRUP (METRO), Pin : 781003	AS-01FC3393, Chasis MAT466403D3P22424	LIQ.Oxygen (Converted from Liq. N2)	15
17	M/s. Premier Cryogenics Ltd Chandmari GUWAHATI, GUWAHATI, Chandmari, KAMRUP (METRO), Pin : 781003	AS-01 CC6947, MAT469103A1C12793	LIQ.Oxygen (Converted from Liq. N2)	12
18	M/s. Assam Air Products Pvt Ltd GUWAHATI, Maniram Dewan Road, Chandmari, GUWAHATI, KAMRUP (METRO), Pin : 781003	AS-01 MC7567,	LIQ.Oxygen (Converted from Liq. N2)	8
19	Himalayan Air Products, Central Chowkidinghee, Radali Path, Dibrugarh, DIBRUGARH, Pin : 786001	AS-05 BC8818	LIQ.Oxygen (Converted from Liq. N2)	24
20	M/s. Assam Air Products Pvt Ltd GUWAHATI, Maniram Dewan Road, Chandmari, GUWAHATI, KAMRUP (METRO), Pin : 781003	AS-01 NC0121	LIQ.Oxygen (Converted from Liq. N2)	8
21	M/s. Sky Airgases Private Limited A/P Plot No 80 D-80 MIDC SUPA Partner, Ahmednagar, Maharashtra 414302	MH-16CD0470	LIQ.Oxygen	19
22	M/s. Sky Airgases Private Limited A/P Plot No 80 D-80 MIDC SUPA Partner, Ahmednagar, Maharashtra 414302	MH-16CD0740	LIQ.Oxygen	19

Note: The LMO tanker at SI 21 & 22 have been provided by the Government of India, from Maharashtra to Assam for facilitation transportation of LMO (hire basis). Gol has extended this support as there is a shortage of LMO tankers in Assam.

Annexure III

District-wise list of Government hospitals in Assam with 30 or more beds

Sl	District	Name of the Health Institution	Type of Health Institution (Medical College/ DH/ SDCH/ CHC/ PHC)	Total Number of Hospital Beds (General Bed + Oxygen Supported Bed + ICU Bed + ICU bed supported by Ventilator)				Total beds
				General Bed (Without Oxygen Support)	Oxygen Supported Bed	ICU Bed without Ventilator Support	ICU Bed with Ventilator Support	
1	Baksa	Barama Model Hospital	CHC	47	3	0	0	50
2	Baksa	Dr. Ravi Boro Civil Hospital	DH	99	18	0	15	132
3	Baksa	Salbari Model Hospital	CHC	72	3	0	0	75
4	Baksa	Nagriji Model Hospital	CHC	40	2	0	0	42
5	Barpeta	BARPETA ROAD FRU	CHC	39	1	0	0	40
6	Barpeta	Majgaon Model Hospital	CHC	50	0	0	0	50
7	Barpeta	Fakuriddin Ali Ahmed Medical College & Hospital	MC	377	123	12	40	552
8	Barpeta	Barpeta Civil Hospital Kalgachia	DH	173	27	0	0	200
9	Barpeta	Bhulukadoba Model Hospital	CHC	44	0	0	0	44
10	Barpeta	Mandia Model Hospital	CHC	40	0	0	0	40
11	Bajali	PATHSALA SDCH	SDCH	50	0	0	0	50
12	Biswanath	Biswanath Chariali SDCH	SDCH	100	0	0	0	100
13	Biswanath	Balichang MH	CHC	40	0	0	0	40
14	Biswanath	Borgang MH	CHC	40	0	0	0	40
15	Biswanath	Gohpur SDCH	SDCH	34	0	0	0	34
16	Biswanath	Kalabari Model Hospital	CHC	40	0	0	0	40
17	Bongaigaon	Boitamari M.G Model Hospital	CHC	68	2	0	0	70
18	Bongaigaon	Bongaigaon Civil Hospital	DH	214	29	0	0	243
19	Bongaigaon	BIDYAPUR CHC	CHC	40	0	0	0	40
20	Bongaigaon	Manikpur M.G Model Hospital	CHC	59	2	0	0	61
21	Bongaigaon	ABHAYAPURI CHC(FRU)	CHC	38	0	0	0	38
22	Cachar	Chibitabichia MH	CHC	47	3	0	0	50
23	Cachar	Palanghat MH	CHC	74	2	0	0	76
24	Cachar	S.M. Dev Civil Hospital	DH	131	3	0	0	134
25	Cachar	Silchar Medical College & Hospital	MC	950	100	0	200	1250
26	Cachar	Kalain CHC	CHC	27	3	0	0	30
27	Charaideo	Lakwa Model Hospital	CHC	60	0	0	0	60
28	Charaideo	Sonari SDCH	SDCH	65	0	0	0	65
29	Charaideo	SAPEKHATI MODEL	CHC	55	0	0	0	55
30	Chirang	Bhetagaon CHC	CHC	28	2	0	0	30
31	Chirang	Mahatma Gandhi Subhajibhar Model Hospital	CHC	42	8	0	0	50

32	Chirang	JSB Civil Hospital	DH	207	23	5	3	238
33	Chirang	Kashikotra Model Hospital	CHC	51	9	0		60
34	DARRANG	JANARAM CHOWKA MODEL HOSPITAL	CHC	57	3	0	0	60
35	DARRANG	KHARUPETIA	CHC	30	0	0	0	30
36	DARRANG	KUNWARI PUKHURI MODEL HOSPITAL	CHC	49	0	0	0	49
37	DARRANG	MANGALDAI CIVIL HOSPITAL	DH	283	30	0	0	313
38	DARRANG	DEOMORNOI	CHC	30	0	0	0	30
39	DARRANG	DUNI MODEL HOSPITAL	CHC	52	0	0	0	52
40	Dhemaji	Bengenagarah CHC	CHC	29	1	0	0	30
41	Dhemaji	Machkhowa Model Hospital	CHC	30	0	0	0	30
42	Dhemaji	District Civil Hospital	DH	175	19	6	0	200
43	Dhemaji	Gogamukh CHC	CHC	39	1	0	0	40
44	Dhemaji	Jonai CHC	CHC	29	1	0	0	30
45	Dhemaji	Silapathar Model Hospital	CHC	28	2	0	0	30
46	Dhubri	Chapar CHC	CHC	30	0	0	0	30
47	Dhubri	Gauripur CHC	CHC	30	0	0	0	30
48	Dhubri	Dhubri Civil Hospital	DH	188	12	0	0	200
49	Dhubri	Halakura CHC	CHC	30	0	0	0	30
50	Dhubri	Diporkuti SDCH	SDCH	89	0	0	0	89
51	Dibrugarh	JOKAI MODEL HOSPITAL	CHC	75	0	0	0	75
52	Dibrugarh	LEZAI KALAKHOWA MODEL HOSPITAL	CHC	81	0	0	0	81
53	Dibrugarh	ASSAM MEDICAL COLLEGE & HOSPITAL, DIBRUGARH	MC	1239	452	59	204	1954
54	Dibrugarh	MORAN TILOI CHC	CHC	30	0	0	0	30
55	Dibrugarh	LENGERI MODEL HOSPITAL	CHC	70	0	0	0	70
56	Dibrugarh	Naharani CHC	CHC	30	0	0	0	30
57	Dibrugarh	Naharkatia SDCH	SDCH	38	0	0	0	38
58	Dibrugarh	Chabua Model Hospital	CHC	68	0	0	0	68
59	Dibrugarh	Tengakhat MG Model Hospital	CHC	71	0	0	0	71
60	Dima Hasao	Haflong Civil Hospital	DH	142	90	0	0	232
61	Dima Hasao	Umrangso CHC	CHC	35	0	0	0	35
62	Dima Hasao	Maibang CHC	CHC	30	0	0	0	30
63	GOALPARA	AMBARI MODEL HOSPITAL	CHC	38	2	0	0	40
64	Goalpara	Jaleswar Model Hospital	CHC	29	1	0	0	30
65	Goalpara	Matia Model Hospital	CHC	48	2	0	0	50
66	Goalpara	RANGJULI CHC	CHC	28	2	0	0	30
67	Goalpara	BIKALI MH	CHC	39	6	0	0	45
68	Goalpara	DUDHNOI FRU	CHC	21	9	0	0	30
69	Goalpara	200 Bedded Civil Hospital, Goalpara	DH	205	5	0	6	216
70	Golaghat	SKKCH	DH	405	29	15	27	476
71	Golaghat	Bokakhat SDCH	SDCH	226	3	0	20	249
72	Golaghat	Kohora Model Hospital	CHC	34	1	0	0	35
73	Golaghat	Dergaon CHC	CHC	28	2	0	0	30
74	Golaghat	Nahardunga Model Hospital	CHC	29	1	0	0	30

75	Golaghat	Khumtai Model Hospital	CHC	40	1	0	0	41
76	Golaghat	Sarupathar CHC	CHC	29	1	0	0	30
77	Golaghat	Uriamghat Model Hospital	CHC	57	3	0	0	60
78	Golaghat	Kachamari Model Hospital	CHC	49	1	0	0	50
79	Hailakandi	Algapur Model Hospital	CHC	75	0	0	0	75
80	Hailakandi	Mohanpur CHC	CHC	30	0	0	0	30
81	Hailakandi	M.G Model Hospital,Dholai	CHC	74	0	0	0	74
82	Hailakandi	S K Roy Civil Hospital, Hailakandi	DH	102	27	0	0	129
83	HOJAI	Jugijan MH	CHC	41	9	0	0	50
84	HOJAI	Nilbagan MH	CHC	80	20	0	0	100
85	HOJAI	Hojai FRU	CHC	50	0	0	0	50
86	HOJAI	Doboka CHC	CHC	30	0	0	0	30
87	HOJAI	District Civil Hospital	DH	50	0	0	0	50
88	HOJAI	Lumding FRU	CHC	30	0	0	0	30
89	HOJAI	Udali MH	CHC	46	4	0	0	50
90	Jorhat	Chungi Kahargaon Model Hospital	CHC	47	3	0	0	50
91	Jorhat	BHOGAMUKH MODEL HOSPITAL	CHC	47	3	0	0	50
92	Jorhat	Jorhat Medical College & Hospital	MC	703	56	42	40	841
93	Jorhat	Teok FRU	CHC	30	0	0	0	30
94	Jorhat	MG Model Hospital Nakachari	CHC	47	3	0	0	50
95	Jorhat	Na-Borachuk Model Hospital	CHC	47	3	0	0	50
96	Jorhat	Titabar SDCH	SDCH	60	0	0	0	60
97	Kamrup	Azara CHC	CHC	30				30
98	Kamrup	Moina khurung Model Hospital	CHC	100				100
99	Kamrup	Boko CHC/FRU	CHC	26	4			30
100	Kamrup	Bamunigaon Model Hospital	CHC	70				70
101	Kamrup	Chhaygaon CHC	CHC	26	4			30
102	Kamrup	Hajo CHC	CHC	26	4			30
103	Kamrup	Singimari Model Hospital	CHC	76		8	10	94
104	Kamrup	Kalitakuchi Model Hospital	CHC	71	5	0	0	76
105	Kamrup	Kamalpur CHC	CHC	58	2			60
106	Kamrup	Sontoli MPHC	PHC	30				30
107	Kamrup	Bezera CHC-FRU	CHC	28	2			30
108	Kamrup	Rangia SDCH	SDCH	34	7			41
109	Kamrup	Sualkuchi CHC	CHC	34	6			40
110	Kamrup	Tolaram Bafna Kamrup Civil Hospital	DH	40				40
111	Kamrup	Mirza CHC	CHC	27	3			30
112	Kamrup Metro	DHIRENPARA	CHC	30	0	0	0	30
113	Kamrup Metro	GMCH	MC	1457	662	0	165	2284
114	Kamrup Metro	MMCH An Annex Hospital to GMCH	GMCH Annexe	204	72	0	24	300

115	Kamrup Metro	Kalapahar Covid Hospital, GMCH Annexe	GMCH Annexe	124	0	19	19	162
116	Kamrup Metro	Sonapur District Hospital	DH	185	15	0	0	200
117	Kamrup Metro	KHETRI CHC	CHC	30	0	0	0	30
118	Kamrup Metro	Govt. Ayurvedic College and Hospital	Ayur	250	0	0	0	250
119	Kamrup Metro	PANDU FRU	CHC	30	0	0	0	30
120	Karbi Anglong	Bokajan CHC	CHC	27	3	0	0	30
121	Karbi Anglong	Deihori MODEL HOSPITAL	CHC	27	3	0	0	30
122	Karbi Anglong	Howraghat CHC	CHC	26	4	0	0	30
123	Karbi Anglong	Bokolia CHC	CHC	27	3	0	0	30
124	Karbi Anglong	Dhentaghat CHC	CHC	29	1	0	0	30
125	Karbi Anglong	Balijuri Model Hospital	CHC	27	3	0	0	30
126	Karbi Anglong	Diphu Medical College & Hospital, Diphu	MC	161	120	11	8	300
127	Karimganj	Kachuadam MG Model Hospital	CHC	100	5	0	0	105
128	Karimganj	Srigouri CHC	CHC	30	0	0	0	30
129	Karimganj	Karimganj Civil Hospital	DH	193	44	0	0	237
130	Kokrajhar	RNB CIVIL HOSPITAL KOKRAJHAR	DH	150	10	24	16	200
131	Kokrajhar	Karigaon Model Hospital	CHC	65	20	0	0	85
132	Kokrajhar	Serfanguri Model Hospital	CHC	60	20	0	0	80
133	Kokrajhar	Dotma CHC	CHC	30	0	0	0	30
134	Kokrajhar	RNB C.H. GOSSAIGAON	SDCH	100	0	0	0	100
135	Kokrajhar	Parbatjhora Model Hospital	CHC	75	10	0	0	85
136	Kokrajhar	Kachugaon CHC	CHC	30	0	0	0	30
137	Lakhimpur	Laluk Model Hospital CCC	CHC	78	2	0	0	80
138	Lakhimpur	Bihpuria CHC	CHC	30	0	0	0	30
139	Lakhimpur	Bongalmora CHC	CHC	30	0	0	0	30
140	Lakhimpur	Boginadi Model Hospital CCC	CHC	78	2	0	0	80
141	Lakhimpur	Dhakuakhana SDCH	SDCH	30	0	0	0	30
142	Lakhimpur	Narayanpur Model Hospital CCC	CHC	78	2	0	0	80
143	Lakhimpur	Dhalpur CHC	CHC	30	0	0	0	30
144	Lakhimpur	Ghilamora CHC	CHC	30	0	0	0	30
145	Lakhimpur	Lakhimpur Medical College & Hospital (NLCH)	MC	280	40	0	6	326
146	Lakhimpur	Telahi Model Hospital CCC	CHC	78	2	0	0	80
147	Lakhimpur	Nawboicha CHC	CHC	30	0	0	0	30
148	Majuli	District Hospital, Garamur	DH	100	0	0	0	100

149	Majuli	Jengraimukh Model Hospital	CHC	58	2	0	0	60
150	Morigaon	Laharighat MH	CHC	48	0	0	0	48
151	Morigaon	Morigaon Civil Hospital	DH	138	12	0	0	150
152	Morigaon	Bhurbandha MGMH	CHC	50	0	0	0	50
153	Morigaon	Dolonghat MH	CHC	42	0	0	0	42
154	Nagaon	Ujaragaon MH	CHC	43	12	0	0	55
155	Nagaon	Bebejia CHC	CHC	30	-	-	-	30
156	Nagaon	DHING FRU	CHC	30	-	-	-	30
157	Nagaon	Jakhalabandha FRU	CHC	30	-	-	-	30
158	Nagaon	Kandoli MH	CHC	61	9	0	0	70
159	Nagaon	KAMPUR URBAN HEALTH CENTRE	CHC	40	0	0	0	40
160	Nagaon	Kampur FRU	CHC	30	-	-	-	30
161	Nagaon	Muwamari MH	CHC	48	2	0	0	50
162	Nagaon	KAWAIMARI FRU	CHC	30	-	-	-	30
163	Nagaon	Simonabasti MH	CHC	69	1	0	0	70
164	Nagaon	B.P. Civil Hospital	DH	184	30	4	22	240
165	Nalbari	MG Model Hospital Belsor	CHC	42	5	0	0	47
166	Nalbari	SMK Civil Hospital	DH	220	15	0	0	235
167	Nalbari	MG Model Hospital, Khatikuchi	CHC	4	46	0	0	50
168	Nalbari	Mukalmua FRU	CHC	36	0	0	0	36
169	Nalbari	Tihu FRU	CHC	30	0	0	0	30
170	Nalbari	M.G. Model Hospital, Makhibaha	CHC	48	6	0	0	54
171	Sivasagar	Demow Model Hospital	CHC	27	3	0	0	30
172	Sivasagar	KSHS NAZIRA SDCH, LIGIRIPUKHURI	SDCH	20	20	0	0	40
173	Sivasagar	Amguri CHC	CHC	26	4	0	0	30
174	Sivasagar	Sivasagar Civil Hospital	DH	229	24	0	16	269
175	Sivasagar	Urban Model Hospital	CHC	130	0	0	0	130
176	Sonitpur	Chariduar CHC	CHC	30				30
177	Sonitpur	Ghoramari Model Hospital Kasumata	CHC	30				30
178	Sonitpur	Dekargaon Model Hospital	CHC	116				116
179	Sonitpur	Tezpur Medical College and Hospital	MC	570				570
180	Sonitpur	Dhekiajuli	CHC	30				30
181	Sonitpur	Sirajuli Model Hospital	CHC	30				30
182	Sonitpur	Kanaklata Civil Hospital	DH	240				240
183	Sonitpur	MCH, Paruwa	DH	100				100
184	Sonitpur	Kusumtala Model Hospital	CHC	30				30
185	Sonitpur	North Jamuguri	PHC	30				30
186	South Salmara Mankachar	Mankachar CHC	CHC	30	0	0	0	30
187	South Salmara Mankachar	SDCH Hatsingimari	SDCH	30	5	0	0	35
188	Tinsukia	Tinsukia Civil Hospital	DH	274	50	0	15	339
189	Tinsukia	Margherita FRU	CHC	85	0	0	0	85
190	Tinsukia	Digboi CHC	CHC	35	0	0	0	35
191	Tinsukia	Doomdooma FRU	CHC	40	0	0	0	40

192	Tinsukia	Phillobari Model Hospital	CHC	30	0	0	0	30
193	Tinsukia	Dangori CHC	CHC	30	0	0	0	30
194	Tinsukia	Sadiya SDCH	SDCH	80	0	0	0	80
195	Tinsukia	Ghumtibill Model Hospital	CHC	50	0	0	0	50
196	Tinsukia	Mohkhuli Model Hospital	CHC	44	0	0	0	44
197	Udalguri	Bhergaon Model Hospital	CHC	39	0	0	0	39
198	Udalguri	Rowta Model Hospital	CHC	50	0	0	0	50
199	Udalguri	Mahaliapara Model Hospital	CHC	40	0	0	0	40
200	Udalguri	Orang CHC	CHC	30	0	0	0	30
201	Udalguri	Udalguri Civil Hospital	DH	132	10	0	5	147
202	Udalguri	Kalaigaon Model Hospital	CHC	40	0	0	0	40
203	Udalguri	Harisinga Model Hospital	CHC	40	0	0	0	40
204	Udalguri	Tangla CHC	CHC	30	0	0	0	30
205	West Karbi Anglong	HAMREN SDCH	SDCH	50	0	0	0	50
206	West Karbi Anglong	DONKAMOKAM BPHC	PHC	30	0	0	0	30

Annexure IV

Model calculation plan for Medical Oxygen requirement

As an example, the table below shows the per-day requirement of oxygen for a hospital with 10 ICU beds plus 20 Oxygen supported beds:

Sl No	Type of Oxygen bed	Number of beds	Recommended Flow Rate of Oxygen per bed in Litre per Minute (LPM)	Per day requirement of cylinders		Required capacity of a PSA Oxygen generator plant (OGP). (Requires central gas pipeline and manifold system)
				Number of D-type/ Jumbo cylinders required (7 m ³ capacity)	Number of B-type/ cylinders required (1.5 m ³ capacity)	
1	ICU bed	10	24 LPM	24 LPM X 60 Minutes X 24 Hours X 10 beds ÷ 1000 (for conversion of Litre to Cubic Metre) =345.6 m ³ , which equivalent to: 345.6 ÷ 7m ³ = 49 D-type cylinders	--	Per day requirement of oxygen in Litre per Minute (LPM) for 10 ICU beds + 20 Oxygen supported beds = 24 LPM X 10 beds +10 LPM X 20 beds = 440 LPM, which is the minimum recommended output capacity of the OGP
2	Oxygen supported bed/ Oxygenated bed	20	10 LPM	Requirement of cylinders connected to manifold system through central gas pipeline: 10 LPM X 60 Minutes X 24 Hours X 20 beds ÷ 1000 (for conversion of Litre to Cubic Metre) =288 m ³ , which equivalent to: 288 ÷ 7m ³ = 41 D-type cylinders	Requirement of cylinders when central gas pipeline & manifold system is not available; oxygen through bedside cylinders: 10 LPM X 60 Minutes X 24 Hours X 20 beds ÷ 1000 (for conversion of Litre to Cubic Metre) =288 m ³ , which equivalent to: 288 ÷ 1.5m ³ = 192 B-type cylinders	

Important note: While calculating requirement of cylinders, at least **three sets** of the required number of cylinders are to be maintained considering the following:

- I. **One set of cylinders which shall be in use**
- II. **One set, filled, which shall be in stand-by, and**
- III. **One set which would be in transit / sent to the supplier for re-filling.**