

Pre-Bid Meeting dated 4 February 2022		
S. No.	Query	Response
1.	Exemption from EMD	MSME registered companies are exempted from submitting EMD (GFR-170) upon production of relevant document.
2.	Contract Value	The Value of EMD is 2% of the of estimated annual contract value.
3.	Contract Value and Period	Although the period of contract is tentatively from 15 Nov 2022 to 31 Dec 2025 (extendable annually for 2 more year), the annual value of contract (payable in monthly instalments to the contractor) is required to be quoted by the bidder. This value shall be used to arrive at the L1 bidder and also determine the amount for PBG.
4.	Changeover of Team	During the austral season (November to early February of the succeeding calendar year), NCPOR shall provide travel to a maximum 06 engineers including the OEM engineer by air or expedition vessel depending upon availability and operational requirements. If the number exceeds due to the reasons attributable to the Contractor, expenses shall be chargeable.
5.	Spare Parts Unavailability	In the event of OEM stop production of spares, approval of NCPOR shall be required for using a substitute on case-to-case basis as per Clause 4.2.4.  However, Clause 4.2.8 requires the Contractor to maintain sufficient inventory of spares and consumables for periodic/ preventative/ breakdown maintenance. In the event of appropriate number of spares/consumables are not maintained at the station or substandard spares are used or negligence of the contractor's crew lead to damages to the life support systems, entire responsibility shall be of the Contractor.
6.	Attendance of Contractor's Crew	Refer Clause 5.1.9. From the date of reporting at NCPOR, Goa the attendance of the Contractor's Crew shall start and the Manpower Cost on pro-rata and man-day basis (if the number is below 04 engineers) shall be payable. The spare parts cost would be payable only for the duration when the charge of Bharati Station for the OMRC remains with Contractor.
7.	Hardship Allowance	As per current guidelines of Govt. of India, Hardship allowance (HDA) for Summer Period (1 Dec to 28/29 Feb of succeeding year) is Rs 1500 Per day while for the Winter Period (1 March to 30 Nov) HDA is Rs 2000 per day. HDA is over and above the monthly salary, and exempted from income tax. In addition, a preparatory kit allowance of Rs. 20,000 and Rs. 30,000 are provided to short- and long-term members, respectively.
8.	Medical for	For the Indian members, the medical screening is conducted

	Contractor's Crew	under the supervision of a Medical Board of AIIMS, New Delhi either at AIIMS, New Delhi or any other place as decided by NCPOR. Medical screening at any other place is generally not permitted. For a foreign crew, however, medical screening/ fitness can be conducted in the native country at the Contractor's cost and expense.
9.	Downtime of component(s) due to Unforeseen Conditions	If any of the components of the life support systems are down/ out of order under any circumstances, Contractor's inventory of spares and consumables shall remain unutilized. Such systems shall be taken out of the contract as per Clause 5.12.1.
10.	Damages/Breakdown	Items listed in Annexure VI (A& B) are to be covered under the contract. Troubleshoot and revival in case of failure of any of the systems mentioned in Annexure VI (A&B), except for unforeseen conditions or structural problems (Clause 4.2.9), shall be the exclusive responsibility of the Contractor.
12.	Taxes for Manpower and Spares	Offered price bid must include all the applicable taxes and L1 will be decided as the sum of basic value and taxes.
13.	Comprehensive or Non-comprehensive maintenance of subsequent expansion	NCPOR shall be at the liberty to decide the nature of maintenance for the systems integrated with the station at a later stage. As any integration is expected to be similar to the existing set up and no additional skills should be required, Contractor must have to agree for repair, operation and maintenance without an extra cost to NCPOR or change in the manpower component (A). However, if a subsequently added system is handed over for comprehensive maintenance, the percentage (quoted under Item C of the price bid) of the asset cost of the actual additions shall be payable to the Contractor on pro-rata basis.
14.	Support from OEM	Five years warranty after the handover of the station is over and direct supports from OEMs are usually not sought/ obtained for services and spares except for critical systems, like power generators. M/s MAN, Cape Town, South Africa provide spares and overhauling support upon request.
15.	Percentage of GST for Manpower and Spares by NCPOR	The bidder shall quote GST or any other taxes, as applicable for Manpower and Spares.
16.	Shipment of Spares	Contractor's consignment of spares and consumables must reach NCPOR, Goa or Cape Town within stipulated time at an expense of the Contractor for onward transmission to Bharati (Clause 4.2.12). Further transport from NCPOR/Cape Town to Bharati by sea route shall be taken care by NCPOR. Transfer of cargo received after the due date and movement of NCPOR's bulk cargo shall be charged as per actuals.
17.	Restriction of Age for Contractor's Crew	Medically fit individuals, as declared by the Medical Board, are deputed for the expedition. However, stakeholders are encouraged to nominate young and healthy personnel.

18.	Exemption on import of Spares/ Consumables for NCPOR	<p>Since the project for implementation is at Bharati Station, Antarctica, imported items may be sent directly to Capetown, South Africa details of the NCPOR agent will be provided after the signing of the contract.</p> <p>For Quality check and Genuineness of the items supplied for the station maintenance and repairs DNB certification shall be arranged by Company at their own cost and expense.</p> <p>In the event of import of spares to India, NCPOR is eligible for availing customs duty exemption in terms of Notification No. 51/96-Cus dated 23.07.1996 as amended by Notification No. 43/ 2017-Cus dated 30.06.2017 and accordingly necessary CDEC shall be issued by NCPOR in case the same is required by the vendor subject to valid documentation and submission of undertaking from the contractor that the items are for exclusive use at Bharati Station for maintenance and repairs.</p>
19.	Submission of Bid	<p>Bid complete in all aspects must be submitted in the physical form on or before the deadline at the following address;</p> <p>Group Director (Antarctic Operations &amp; Infrastructure) National Centre for Polar&amp; Ocean Research (NCPOR) Ministry of Earth Sciences, Govt. of India (MoES) Headland Sada, Vasco-da-Gama, Goa – 403 804. (India)</p>
20.	Consumption Pattern	<p>Spares and consumables for maintenance of the systems are consumed as per the maintenance schedule elaborated in Annexure-XII(B). Summary of breakdown maintenance/repair has been provided as Appendix-I (in the end of this document).</p>
21.	Vintage of equipment	<p>Bharati Station was constructed during year 2010-12 and the systems as detailed in Annexure VI (A &amp; B) are fully operational at present since the inception of the station.</p>
22.	Extension for Submission of Bid	<p>The date is extended 17 March 2022 at 14:00 hrs (IST)</p>
23.	Payment for OEM Support	<p>Contractor shall arrange for specialist/OEM support at their own cost and expense. The proposal for requirement of specialist support including number of workdays shall be submitted to NCPOR on or before 30 September of a calendar year. Travel shall be arranged along with other expedition members depending upon availability of flight or ship.</p>
24.	Payment for the Spare Component	<p>Monthly payment for (A) manpower, (B) spares and (C) subsequent expansion shall be made on pro-rata basis as detailed in Clause 5.8 of the tender document.</p>
25.	BOQ	<p>Details of system and item level breakup (XI-C) have been provided in the tender document. In addition,</p>

		maintenance check sheet (XII-B) for the life support system has also been provided. These details should suffice for estimating the BOQ.
26.	From Pre-bid meeting it is understood that for Passport preparation & training, team shall reach NCPOR Goa a week/ month before (as per the prevalent COVID Guidelines).	NCPOR will bear the costs
27.	Laptop provision	NCPOR will not provide any laptop, however personal laptop or company laptop are allowed as per the international travel regulations
28.	Police Clearance Certificate (PCC)	Not mandatory the company May proceed for its own requirement
29.	Check sheet of Equipment run hours	Please see Annexure 2. as attached with this document
30.	Applicable VAT/ GST/ Custom duties/ Any other duty/ Tax	<p>For Items Sent from India or any foreign country other than South Africa: Items in transit at Cape town for Indian, Antarctic expedition are exempted from customs duty or local taxes, levies at Cape Town, South Africa as the items are stored in the bonded warehouse under customs supervision, till they are sent to Antarctica</p> <p>Items sourced from South Africa: items procured at South Africa for export to Antarctica are exempted from VAT however the supplier in South Africa is to be informed by the bidder well in advance that the items are not for local consumption and are for the Indian research stations situated at Antarctica.</p>
31.	Discrepancies in Clause 6.1.1 and 6.1.5	Single bidder must have technical experience in the fields elaborated at 6.1.1.1 to 6.1.1.5. However, in the event of JV or Consortium of Companies, the lead partner must have experience in any of the two field and other partner(s) should have experience in at least one of the five field. Experience in all the technical fields are essential by the JV/Consortium and under the situation when the lead partner has experience in 2-fields, and another partner has experience in just one field, two remaining fields should be covered by additional one or two partners. The joint bidding agreement/MoU between the partners, valid for the entire period of the contract, to be submitted along with the bid (Clause 5.6).
32	PBG	Since the project is crucial in nature and to be implemented in

		Antarctica, hence the PBG asked is 10%.
33.	During pre-bid meeting it was understood that NCPOR has the advantage of reduced IGST/ Custom Duties on the consignment imported for them.	<p>Yes, under Ministry of Finance notification no: 45/2017 – Central tax and No. 47/2017- Integrated tax rate.</p> <p>As per the amendment dated 18th Nov. 2021 by CBIC which have come into effect from 01.01.2022 all supply of composite work contract to Government entity will attract 18% GST.</p>

**Annexure 1:**

<b>Year 2021</b>			
S No	System	Technical Issue	Spare part used
1	Air Handling Unit (AHU)	AHU Supply Air Humidity Sensor Failure	Sensor type- Duct humidity sensor, Make-JCI, Model-HT-9000-UD2.
		AHU Humidifier Supply line Solenoid Valve Failure	Solenoid valve (Make- Burkert Model No.00251771) - 01 Nos
		AHU Extract Air Waste Water Treatment Fan Damaged.	Part Used: fan (Make: Helios, Type: SB 125 A)
2	Reverse Osmosis (RO)	RO Acid dosing Pump failure	ILT Constructions GmbH, Model - Pump KMSADC 200, 5EP, 230V
3	Combined Heat & Power Unit (CHP)	CHP-1 Cooling water pressure alarm	The pressure transducer switch Model No. 0340008 Pmax- 6bar
		CHP -3 Air Temperature container Sensor	The sensor cable inside the terminal box was cut, removed the sensor, cleaned and reconnected
4	Fuel Farm	Fuel farm tank level display Issue	Make- Siemens Model SITOP PSE200U 3A
5	Miscellaneous	Workshop area Lifting pump Failure	Make- ABS, Type-ROBUSTA 202 W/TS - 01 Nos
<b>Year 2020</b>			
1	Air Handling Unit (AHU)	AHU Return Air Fan VFD fault	VFD (make: Danfoss, part no.13U0980, 2.2KW, 400V): 1no
		AHU humidifier pump not working	humidifier pump (Make: BRINKMANN PUMPS, Model: D-58791 werdohl, Type: KTF 25/120 FTX+402): 1No
		Freshwater buffer tank 1 level sensor problem	level sensor (Make: Fischer, Part no:110129): 1No.
		Ro pit pump damaged	lifting pump (Make: Grundfos, Model: KP350)
3	Combined Heat & Power Unit (CHP)	CHP-1 under speed and under frequency alarm and stopped running.	Speed sensor (Make: Mo+tortec, part no: 63.60.002-50): 1No.
		Outlet temperature of cooling water (CHP cooling glycol) of CHP 1 was Out of Set Point.	Make: JUMO, part no:902230/40-1-415-1003
		Grey water reuse tank pump 1	make: Leader, model:

4	Solid Treatment Plant (STP)	Problem	ECODIVER 1200
		Store room 2 Dirty water lifting pump damaged	: Pump (Make: Sulzer, Type: ROBUSTA 202 W/TS): 1No
		MBR Decanting Motor Starting Problem	make: ABB, part no: AF09-30-10-11)
5	Sea Water Intake	Sea water intake Pump 2 Cable short Circuit Fault	make: Grundfos, part no: VDE-REG 8008
		Sea water intake pump1 line brass ball valve damaged	1.5-inch brass ball valve
6	Pipe Line	Waste water line heat tracing short circuit and pipe blockage problem- The waste water line pressure sensor PISAHL28 showed the reading 1000 mbar.	pipe and accessories
		waste water discharge line leakage	pipe and accessories
7	Fire Alarm System	Gas solenoid valve kitchen damaged.	Make: BENDER, Model: 00184238, Rating: PN 0-0.5Bar, 230V AC/DC, 12W, DN15)
		Power supply flame detector panel battery fault	battery (Make:Esser, part no: 018006, model :SB12-24).-- 1 No
		Repeater Fire Alarm Panel Battery Failure	battery module (part no. 20140614D make:ESSER)
8	Miscellaneous	Toilet washbasin drain pipe water leakage	: make: viega, part no:7985.60
		Regarding temperature issue in the cold storage 1 kitchen (+4 degree)	Outdoor Unit Relay

**Year 2019**

S No	System	Technical Issue	Spare part used
1	Air Handling Unit (AHU)	AHU Supply fan abnormal sound	supply fan motor with a new bearing (part no: 620622ZRC3, make: FAG)
		AHU humidifier pump not working	make: brinkman pumps, model: KYF25/120FKT
		AHU Return Fan Timer Relay Damaged	Miniature Plug in Timer Relay (30K6)
		Garage fan VFD display not working	VFD Display Make - Danfoss (We change only display from

			spare)
2	Reverse Osmosis (RO)	RO PH meter not working	make: prominent, Model No: DCCAS006PR0010DE
		RO high pressure pipe leakage	High pressure pipe from pump to pressure vessel 1
		RO station feed water pump pressure vessel damage	Pressure Vessel: Make: Reflex, Model No: DD8
		RO Pit tank lifting pump P81.1 fail to work	Make: Grundfos, Model: KP350
3	Combined Heat & Power unit (CHP)	CHP 3 the engine glycol cooling water pressure gauge was indicating unusual rise in pressure 2.4 bar than the normal	lube oil plate type cooler gasket
		CHP1 and CHP3 is having trouble while starting	70AH Batteries
		CHP exhaust bypass valve (control side) PCB got damaged	Exhaust Valve PCB
		CHP Blackout due to Alarm- low cooling water pressure	Glycol 30 litres
		CHP Blackout due to Alarm- Gen. overvoltage 2	6 No fuel Injector
		CHP3 Glycol Hose Leakage	New Hose link from Crane spare parts. IKD PCB Unit
4	Solid Treatment Plant (STP)	MBR Macerator not working	(Make: prominent, Model No: DCCAS006PR0010DE)
5	Sea Water Intake	Sea water intake pipe line valve damage	valve Make: Viega, DN 25, Brass
6	Pipe Line	Discharge water Pipe line leakage	Rockwool for 15-meter pipeline and 15-meter heat tracing cable
7	Heating System	Glycol leakage in static heater	washer ring (part no. 1016845)
		Sea Water Heating water pump VFD problem	VFD (Make: Grundfos Type: MGE 71A2-14FT85-C, Product No: 85903765 -v010.000)
8	Fire Alarm System (FAS)	Kitchen Fogtech system fire hose tube leakage	fire hose tube (part no:21200288) nitrogen cylinder (part no. 311000315)
		Kitchen hood system display problem	Make: elt, Model no: BE-275-UV-LED
		Fire Alarm Sensor got damage	Part used: make: Esser, Part no. 801824



		Repeater Fire Alarm Panel Battery Failure	Battery (12V, 10Ah, Model No.788055.10)
9	Miscellaneous	-18 refrigerator refrigerant leakage problem	PVC pipe and accessories
		Washbasin drain pipe damaged	PVC pipe and accessories
<b>Year 2018</b>			
S No	System	Technical Issue	Spare part used
1	Air Handling Unit (AHU)	AHU Return Fan Timer Relay Damaged	Miniature Plug in Timer Relay (30K6)
		Humidifier Mesh Replacement	New humidifier mesh: 1 set (3 sections)
		Humidifier Pump Damaged	make: brinkmann pumps, model: KYF25/120FKT
		AHU Humidifier Water Supply Solenoid Valve damaged	Solenoid valve (Make- Burkert Model No.00251771) - 01 Nos
2	Reverse Osmosis (RO)	Insufficiency of RO plant Production Water Flow Rate	high pressure pump, make:Danfoss, model:App 1.0
		RO2 High Pressure Pump Failure	High Pressure Pump (Make-Danfoss type: APP 1.0, serial no: 33423701-261, code no: 180B3049): 1 no
		RO Station Supply Booster Pump1 Leakage	Shaft seal kit- 1 nos
		Water leakage from RO 5 Micron filter Connecting Assembly	filter assembly Coupling - 1 No.
		RO Waste pit tank lifting pump Damaged	Pump Grundfos (modelkp350): 1 no
		RO High pressure tube puncture	High Pressure tube and connectors
3	Combined Heat & Power Unit (CHP)	CHP2 Cooling water pressure switch Failure	Pressure Switch: 1 Nos
		CHP1 fuel filter leakage	Fuel filter - 2nos
		CHP-1 Starting Issue	Yuasa batteries 12v 65Ah :2 no's
		Exhaust Gas leakage From CHPs Exhaust Gas Manifold	none
		CHP3 battery problem	Yuasa battery 12v 65Ah: 2 no's
		BMS PC UPS Failure	UPS (APC 1500): 1nos
		LPG Solenoid Valve Problem	Solenoid Valve (Make: BENDER, Model: 00184238,

4	Building Management System (BMS)		Rating: PN 0-0.5Bar, 230V AC/DC, 12W, DN15)- 1 Nos.
		SOC 3 UPS Failure	UPS (SMART UPS 1500VA): 1 no's
5	Sea Water Intake	Sea water intake pump-1 auto operation issue	Part issue: Omron relay(24VDC) - 1 Nos.
6	Solid Treatment Plant (STP)	Waste water Discharge Line Leakage	Adhesive Material
		MBR Decanting Issue	None
		Waste Water KSB Lifting pump Failure	KSB Pump-1no
7	Hot Water System	Hot Water Tank2 Glycol Circulation Pump VFD Failure	Spare pump drive (MGE 71A2-14FT86-C): 1 NOS
8	Fire Alarm System (FAS)	PS (Power Supply) Flame Detector CHP1,2,3 Panel Fault	Panel PCB Board: 1nos
9	Miscellaneous	Failure of mini-Refrigerator of kitchen to maintain set temperature	Spare fridge
		Kitchen Hood UV Touch Panel Display Problem	Halton Touch panel- 1 No. UV controller - 2nos.
		Problem in -18 deep freezer	Relay 1 NO (Make: Electrica, 565412, RVA403D 370. L811, 35A-400VAC Made in Italy)
<b>Year 2017</b>			
1	Air Handling Unit (AHU)	AHU Supply Air Fan2 Timer Relay Damaged	Miniature Plug in Timer Relay (30K6)
		AHU Softener Unit Valve Issue	Solenoid valve (Make- Burkert Model No.00251771) - 01 Nos
		AHU Extract Air Waste Water Treatment Fan Damaged	Extract Fan: 1nos (Make: Helios, Type: SB 125 A, Art N: 09506 001 PC06319)
		AHU Humidifier Pump Damaged	Humidifier Pump (Make: BRINKMANN PUMPS, Model: D-58791 werdohl, Type: KTF 25/120 FTX+402): 1no
		AHU Return Fan Timer Relay Damaged	Miniature Plug in Timer Relay
		AHU Supply Air Fan2 Damaged	supply fan motor with a new bearing (part no: 620622ZRC3,

			make: FAG)
		AHU Supply Air Fan1 Timer Relay Damaged	Miniature Plug in Timer Relay (30K6)
		AHU Supply Air Fan1 Damaged	supply fan motor with a new bearing (part no: 620622ZRC3, make: FAG)
2	Reverse Osmosis (RO)	RO Station Supply Booster Pump1 Leakage	Shaft Seal Kit (Make: Grundfos, Model: 96455086 HQQE 96441877): 1no
		RO waste pit tank lifting pump damaged	Lifting Pump (Make: Leader, Model: ECODIVER 1200): 1no
		RO1 High Pressure Switch Leakage	High Pressure Switch: 1 Nos
		RO Station Supply Booster Pump2 Leakage	Shaft Seal Kit (Make: Grundfos, Model: 96455086 HQQE 96441877): 1no
		"K Fault OS/RO1" fault on RO Touch panel	None
		RO UV Circulation Issue	Sensor Probe (Model: BWT SUV20.2A2Y1C): 1no 80W UV Tube: 1no
3	Combined Heat & Power Unit (CHP)	CHP1 Battery Damaged	12V, 65Ah SMF Battery: 2nos
		CHP3 Battery Leak- touch panel was showing the error alarm "CAN open interface 2" & " Oil recuperator fail" repeatedly.	Lead Acid battery (Make: YUASA, Model: NP65-12I, Rating: 12V 65 Ah): 1no
		CHP2 Fuel Flow Meter Problem	Aqua Metro fuel flow meter (Make: Aqua Metro Model: CONTOIL VFL 15 FL 130/25): 1no
4	Building Management System (BMS)	UPS Failure of SOC2 Panel	UPS 1000VA (Make: Mecer, Model: Me-1000-VU+): 1no
5	Sea Water Intake	Sea Water Intake Pipe2 Ball Valve Damaged	1.5inch Brass Ball Valve: 2nos
		Dirty Water Lifting Pump 1.25 Damaged	Lifting pump (Make: Sulzer, Type: ROBUSTA 202 W/TS): 1no

6	Solid Treatment Plant (STP)	Grey Water Permeate Box Issue	membrane vacuum pump (Make: iWater, Model: M2K3, Article No: 80119): 1no
		Grey Water System Vacuum Pump Damaged	membrane vacuum pump (Make: iWater, Model: M2K3, Article No: 80119): 1no
		MBR Decanting Issue	Decanter cleaned thoroughly and greasing off all points done.
		Waste Water Discharge Line Leakage	None
		Overflow in Lab Toilet Lifting Pump	None
7	Heating System	Vertical Static Heater Glycol Leakage	Glycol pipe
8	Fire Alarm System (FAS)	FAS Prayer Room Alarm-Smoke detector activated	smoke detector
		LPG Solenoid Valve Problem	Solenoid Valve (Make: BENDER, Model: 00184238, Rating: PN 0-0.5Bar, 230V AC/DC, 12W, DN15): 1no
9	Miscellaneous	Container Refrigerators Power Issue	3Phase IP44 Connector: 1no
		Lake Water Intake Leakage Issue	Metal T Joint: 1no
		Kitchen Hood UV Light Issue	None
		Problem in -18 deep freezer	GE Make Relay Device (Model: 3ARR3T6AE3): 1no FALCON Make Capacitor (Model: 04P.55E662) 1no

**Annexure 2:**

**1. CHP and Fuel Tank Spare consumption from Jan 2019 – Dec 2021**

Sr. No	Month	Spare	Quantity	Periodic Maintenance/ Breakdown Maintenance
1	Jan 2019	Lube Oil	100 Ltrs	PM
2		Lube Oil Filter	3 Nos	PM
3		Fuel Filter	6 Nos	PM
4		Air Filter	2 Nos	PM
5		Head Gasket	18 Nos	PM
6	Feb 2019	Lube Oil	150 Ltrs	PM
7		Lube Oil Filter	3 Nos	PM
8		Fuel Filter	6 Nos	PM
9		Fuel Pre Filter	3 Nos	PM
10		Head Gasket	18 Nos	PM
11	March 2019	Lube Oil	150 Ltrs	PM
12		Lube Oil Filter	3 Nos	PM
13		Fuel Filter	6 Nos	PM
14		Head Gasket	24 Nos	PM
15		Injector with Nozzle	6 Nos	PM
16		Copper Washer for Nozzle	6 Nos	PM
17	April 2019	Lube Oil	80 Ltrs	PM
18		Lube Oil Filter	2 Nos	PM
19		Fuel Filter	4 Nos	PM
20		Air Filter	2 Nos	PM
21		Head Gasket	12 Nos	PM
22	May 2019	Lube Oil	120 Ltrs	PM
23		Lube Oil Filter	3 Nos	PM
24		Fuel Filter	6 Nos	PM
25		Air Filter	1 Nos	PM
26		Head Gasket	18 Nos	PM
27		Glycol	30 Ltrs	BM
28		Pressure Transducer 6 Bar (Model: 340008)	1 No	BM
29	June 2019	Lube Oil	160 Ltrs	PM
30		Lube Oil Filter	4 Nos	PM
31		Fuel Filter	8 Nos	PM

32		Air Filter	1 Nos	PM
33		Head Gasket	24 Nos	PM
34		Batteries	4 Nos	BM
35		Exhaust Bypass Valve PCB	1 No	BM
36	July 2019	Lube Oil	120 Ltrs	PM
37		Lube Oil Filter	3 Nos	PM
38		Fuel Filter	6 Nos	PM
39		Air Filter	2 Nos	PM
40		Head Gasket	18 Nos	PM
41	Aug 2019	Lube Oil	120 Ltrs	PM
42		Lube Oil Filter	3 Nos	PM
43		Fuel Filter	10 Nos	PM
44		Fuel Pre Filter	5 Nos	PM
45		Head Gasket	18 Nos	PM
46		Glycol	24.5 Ltr	BM
47		Pressure Transducer-6 Bar, (Make: SIT, Part No: 340008)	1 No	BM
48	Sep 2019	Lube Oil	120 Ltrs	PM
49		Lube Oil Filter	3 Nos	PM
50		Fuel Filter	6 Nos	PM
51		Air Filter	1 Nos	PM
52		Head Gasket	18 Nos	PM
53		Lube Oil Cooler Gasket	1 No	BM
54	Oct 2019	Lube Oil	120 Ltrs	PM
55		Lube Oil Filter	3 Nos	PM
56		Fuel Filter	6 Nos	PM
57		Head Gasket	18 Nos	PM
58	Nov 2019	Lube Oil	120 Ltrs	PM
59		Lube Oil Filter	3 Nos	PM
60		Fuel Filter	6 Nos	PM
61		Head Gasket	18 Nos	PM
62	Dec 2019	Lube Oil	150 Ltrs	PM
63		Lube Oil Filter	3 Nos	PM
64		Fuel Filter	6 Nos	PM
65		Fuel Pre Filter	3 Nos	PM
66		Head Gasket	18 Nos	PM
167	Jan 2020	Lube Oil	150 Ltrs	PM
268		Lube Oil Filter	3 No	PM
369		Fuel Filter	6 Nos	PM
470		Fuel Pre Filter	3 No	PM
71		Head Gasket	18 Nos	PM
72		Glycol	120 Ltrs	BM
573	Feb 2020	Lube Oil	150 Ltrs	PM
674		Lube Oil Filter	3 Nos	PM

775		Fuel Filter	10 Nos	PM
76		Fuel Pre Filter	2 Nos	PM
77		Head Gasket	18 Nos	PM
78	March 2020	Lube Oil	150 Ltrs	PM
79		Lube Oil Filter	3 Nos	PM
80		Fuel Filter	6 Nos	PM
81		Head Gasket	18 Nos	PM
82	April 2020	Lube Oil	150 Ltrs	PM
83		Lube Oil Filter	3 Nos	PM
84		Fuel Filter	6 Nos	PM
85		Head Gasket	18 Nos	PM
86		Batteries for CHP	2 Nos	BM
87	May 2020	Lube Oil	150 Ltrs	PM
88		Lube Oil Filter	3 Nos	PM
89		Fuel Filter	6 Nos	PM
90		Head Gasket	18 Nos	PM
91	June 2020	Lube Oil	150 Ltrs	PM
92		Lube Oil Filter	3 Nos	PM
93		Fuel Filter	6 Nos	PM
94		Head Gasket	18 Nos	PM
95		Cooling water Temperature sensor (Make:JUMO, Part No:902230/40-1-415-1003)	1 NO	BM
96	July 2020	Lube Oil	150 Ltrs	PM
97		Lube Oil Filter	3 Nos	PM
98		Fuel Filter	6 Nos	PM
99		Head Gasket	18 Nos	PM
100		Speed Sensor (Make:Motortec, Part No:63.60.002-50)	1 No	BM
101	Aug 2020	Lube Oil	150 Ltrs	PM
102		Lube Oil Filter	3 Nos	PM
103		Fuel Filter	6 Nos	PM
104		Head Gasket	18 Nos	PM
105	Sep 2020	Lube Oil	100 Ltrs	PM
106		Lube Oil Filter	2 Nos	PM
107		Fuel Filter	4 Nos	PM
108		Head Gasket	12 Nos	PM
109	Oct 2020	Lube Oil	180 Ltrs	PM
110		Lube Oil Filter	4 Nos	PM
111		Fuel Filter	8 Nos	PM
112		Head Gasket	18 Nos	PM

113	Nov 2020	Lube Oil	100 Ltrs	PM
114		Lube Oil Filter	2 Nos	PM
115		Fuel Filter	4 Nos	PM
116		Head Gasket	12 Nos	PM
117	Dec 2020	Lube Oil	200 Ltrs	PM
118		Lube Oil Filter	4 Nos	PM
119		Fuel Filter	8 Nos	PM
120		Head Gasket	24 Nos	PM
121	Jan 2021	Lube Oil	100 Ltrs	PM
122		Lube Oil Filter	2 Nos	PM
123		Fuel Filter	4 Nos	PM
124		Head Gasket	12 Nos	PM
125		Injector with Nozzle	6 Nos	PM
126		Ethylene Glycol	70 Ltrs	PM
127	Feb 2021	Lube Oil	150 Ltrs	PM
128		Lube Oil Filter	3 Nos	PM
129		Fuel Filter	10 Nos	PM
130		Fuel Pre Filter	2 Nos	PM
131		Head Gasket	18 Nos	PM
131		Injector with Nozzle	12 Nos	PM
132		Batteries	6 Nos	PM
133	Mar 2021	Lube Oil	150 Ltrs	PM
134		Lube Oil Filter	3 Nos	PM
135		Fuel Filter	10 Nos	PM
136		Head Gasket	18 Nos	PM
137	April 2021	Lube Oil	140 Ltrs	PM
138		Lube Oil Filter	3 Nos	PM
139		Fuel Filter	6 Nos	PM
140		Head Gasket	18 Nos	PM
141	May 2021	Lube Oil	140 Ltrs	PM
142		Lube Oil Filter	3 Nos	PM
143		Fuel Filter	6 Nos	PM
144		Fuel Pre Filter	1 No	PM
145		Head Gasket	18 Nos	PM
146		Air Filter	1 No	PM
147		Cooling Water Pressure Sensor (Model No: 0340008 Pmax-6 bar)	1 No	BM
148	June 2021	Lube Oil	160 Ltrs	PM
149		Lube Oil Filter	3 Nos	PM
150		Fuel Filter	6 Nos	PM
151		Fuel Pre Filter	2 Nos	PM



152		Head Gasket	18 Nos	PM
153		Air Filter	1 No	PM
154	July 2021	Lube Oil	120 Ltrs	PM
155		Lube Oil Filter	3 Nos	PM
156		Fuel Filter	10 Nos	PM
157		Fuel Pre Filter	2 Nos	PM
158		Head Gasket	18 Nos	PM
159		Fuel Injector with Nozzle	6 Nos	BM
160	August 2021	Lube Oil	120 Ltrs	PM
161		Lube Oil Filter	3 Nos	PM
162		Fuel Filter	6 Nos	PM
163		Head Gasket	18 Nos	PM
164		Air Filter	1 No	PM
165	Sep 2021	Lube Oil	140 Ltrs	PM
166		Lube Oil Filter	3 Nos	PM
167		Fuel Filter	6 Nos	PM
168		Head Gasket	18 Nos	PM
169	Oct 2021	Lube Oil	140 Ltrs	PM
170		Lube Oil Filter	3 Nos	PM
171		Fuel Filter	6 Nos	PM
172		Head Gasket	18 Nos	PM
173		Air Filter	3 Nos	PM
174	Nov 2021	Lube Oil	200 Ltrs	PM
175		Lube Oil Filter	4 Nos	PM
176		Fuel Filter	12 Nos	PM
177		Head Gasket	24 Nos	PM
178		Fuel Pre Filter	4 Nos	PM

**\*Note- Engine Lube Oil/ ATF is under NCPOR Scope during OMRC Tender.**

## **2. Sewage treatment unit Spare consumption from Jan 2019 – Dec 2021**

Sr. No	Month	Spare	Quantity	Periodic Maintenance/ Breakdown Maintenance
1	Jan 2019	Sodium Hypochloride	400 ml	PM
2		Grey water Bag Filter	1 No	PM
3	Feb 2019	Grey Water reused tank Float	1 No	PM
4	March 2019	Sodium Hypochloride	400 ml	PM
5		Grey water Bag Filter	1 No	PM
6		Bacteria Recharge	250 gm	PM
7	April 2019	Sodium Hypochloride	400 ml	PM
8		Grey water Bag Filter	1 No	PM
9		Bacteria Recharge	250 gm	PM
10		Macerator Contactor (Make: ABB,	1 No	BM

		Model No: AF09-30-10-11)		
11	May 2019	Sodium Hypochloride	400 ml	PM
12		Grey water Bag Filter	1 No	PM
13		Waste Water Pipe line trace heating	20 mtrs	BM
14		Toilet wash basin Adapter	1 No	BM
15	June 2019	Sodium Hypochloride	400 ml	PM
16		Bacteria Recharge	250 gm	PM
17	July 2019	Sodium Hypochloride	400 ml	PM
18		Grey water Bag Filter	1 No	PM
19		Bacteria Recharge	250 gm	PM
20	Aug 2019	Sodium Hypochloride	400 ml	PM
21		Grey water Bag Filter	1 No	PM
22		Bacteria Recharge	250 gm	PM
23		Grease (Macerator Headstock Lubrication)	200 gm	PM
24		Grease (Screw Pump Lubrication)	200 gm	PM
25		Grease (Decanter Lubrication)	200 gm	PM
26		Blower Filter	2 Nos	PM
27	Sep 2019	Sodium Hypochloride	400 ml	PM
28		Grey water Bag Filter	1 No	PM
29		Bacteria Recharge	250 gm	PM
30	Oct 2019	Sodium Hypochloride	400 ml	PM
31		Grey water Bag Filter	1 No	PM
32		Bacteria Recharge	600 gm	PM
33	Nov 2019	Sodium Hypochloride	400 ml	PM
34		Grey water Bag Filter	2 No	PM
35		Bacteria Recharge	600 gm	PM
36	Dec 2019	Multipurpose Grease	200 gm	
37		Grey water Bag Filter	1 No	PM
38		Blower Filter	2 Nos	PM
39		Membrane	2 Nos	PM
40		Air Diffuser	5 Nos	PM
41		Bacteria Recharge	250 gm	PM
42		Pressure Gauge 0-6 Bar	1 No	PM
43	Jan 2020	Grey water Bag Filter	1 No	PM
44		Bacteria Recharge	250 gm	PM
45	Feb 2020	Sodium Hypochloride	500 ml	PM
46		Grey water Bag Filter	1 No	PM
47		Bacteria Recharge	500 gm	PM
48	March 2020	Sodium Hypochloride	500 ml	PM
49		Grey water Bag Filter	1 No	PM
50		Bacteria Recharge	500 gm	PM
51	April 2020	Sodium Hypochloride	500 ml	PM
52		Grey water Bag Filter	2 No	PM

53		Bacteria Recharge	500 gm	PM
54		Grease (Decanter)	20 gm	PM
55		Basic Powder (Decanter)	4 kg	PM
56		Ethanol	10 ml	PM
57		Grease (Macerator)	50 gm	PM
58		Lifting Pump (Make: Sulzer, Type: ROBUSTA, 202 W/TS)	1 No	BM
59	May 2020	Sodium Hypochloride	500 ml	PM
60		Grey water Bag Filter	1 No	PM
61		Bacteria Recharge	600 gm	PM
62	June 2020	Sodium Hypochloride	700 ml	PM
63		Grey water Bag Filter	2 No	PM
64		Bacteria Recharge	400 gm	PM
65	July 2020	Sodium Hypochloride	500 ml	PM
66		Grey water Bag Filter	1 No	PM
67		Bacteria Recharge	1 kg	PM
68		Ethanol	10 ml	PM
69		Grease (Decanter)	20 gm	PM
70		Basic Powder (Decanter)	4 kg	PM
71		Grease (Macerator Headstock Lubrication)	50 gm	PM
72		Grease (Screw Pump Lubrication)	50 gm	PM
73	Aug 2020	Sodium Hypochloride	500 ml	PM
74		Grey water Bag Filter	1 No	PM
75		Bacteria Recharge	500 gm	PM
76		Lifting Pump (Make: Sulzer, Type: ROBUSTA, 202 W/TS)	1 No	BM
77	Sep 2020	Sodium Hypochloride	500 ml	PM
78		Grey water Bag Filter	1 No	PM
79		Bacteria Recharge	500 gm	PM
80	Oct 2020	Sodium Hypochloride	750 ml	PM
81		Grey water Bag Filter	1 No	PM
82		Bacteria Recharge	600 gm	PM
83		Grease (Decanter)	20 gm	PM
84		Basic Powder (Decanter)	4 kg	PM
85		Ethanol	10 ml	PM
86		PVC Siphon (Make: Viega, Part No: 7985.60)	1 No	BM
87		Waste Water Pipe line trace heating	10 mtrs	BM
88		Electro fusion pipe connector	2 Nos	BM
89	Nov 2020	Sodium Hypochloride	750 ml	PM
90		Grey water Bag Filter	1 No	PM
91		Bacteria Recharge	400 gm	PM
92	Dec 2020	Sodium Hypochloride	1000 ml	PM
93		Grey water Bag Filter	1 No	PM

94		Bacteria Recharge	250 gm	PM
95		Multipurpose Grease	200 gm	PM
96		Paraffin Oil	3.5 Ltrs	PM
97		Grey Water reuse tank Capacitor 12 microFarad	1 No	BM
98	Jan 2021	Grey water Bag Filter	1 No	PM
99		Bacteria Recharge	250 gm	PM
100		Grease	20 gm	PM
101	Feb 2021	Sodium Hypochloride	500 ml	PM
102		Grey water Bag Filter	1 No	PM
103		Bacteria Recharge	500 gm	PM
104		Toilet and Urinal flushing Pump (Make: Grundfos)	1 No	BM
105		Urinal Flushing Pneumatic Valve	1 No	BM
106		MBR Membrane	2 Nos	PM
107	March 2021	Sodium Hypochloride	500 ml	PM
108		Grey water Bag Filter	3 Nos	PM
109		Bacteria Recharge	350 gm	PM
110	April 2021	Sodium Hypochloride	500 ml	PM
111		Grey water Bag Filter	2 Nos	PM
112		Bacteria Recharge	350 gm	PM
113	May 2021	Sodium Hypochloride	500 ml	PM
114		Grey water Bag Filter	2 Nos	PM
115		Bacteria Recharge	350 gm	PM
116	June 2021	Sodium Hypochloride	500 ml	PM
117		Grey water Bag Filter	2 Nos	PM
118		Bacteria Recharge	350 gm	PM
119	July 2021	Sodium Hypochloride	500 ml	PM
120		Grey water Bag Filter	1 Nos	PM
121		Bacteria Recharge	1 kg	PM
122		Ethanol	10 ml	PM
123		Grease (Decanter)	20 gm	PM
124		Basic Powder (Decanter)	4 kg	PM
125		Blower Filter	2 Nos	
126		Grease (Macerator Headstock Lubrication)	50 gm	PM
127		Grease (Screw Pump Lubrication)	50 gm	PM
128	Aug 2021	Sodium Hypochloride	500 ml	PM
129		Grey water Bag Filter	2 Nos	PM
130		Bacteria Recharge	350 gm	PM
131	Sep 2021	Sodium Hypochloride	500 ml	PM
132		Grey water Bag Filter	2 Nos	PM
133		Bacteria Recharge	350 gm	PM
134	Oct 2021	Sodium Hypochloride	1000 ml	PM
135		Grey water Bag Filter	2 Nos	PM

136		Bacteria Recharge	350 gm	PM
137	Nov 2021	Sodium Hypochloride	500 ml	PM
138		Grey water Bag Filter	1 Nos	PM
139		Bacteria Recharge	200 gm	PM
140		Ethanol	10 ml	
141		Grease (Decanter)	20 gm	PM
142		Basic Powder (Decanter)	4 kg	PM
143		Grease (Macerator Headstock Lubrication)	50 gm	PM
144		Grease (Screw Pump Lubrication)	50 gm	PM
145		Urinal flushing pump capacitor 12.5uf	1 No	BM

### 3. Reverse Osmosis unit Spare consumption from Jan 2019 – Dec 2021

Sr. No	Month	Spare	Quantity	Periodic Maintenance/ Breakdown Maintenance
1	Jan 2019	Anti-ScalantVitecSulphuric Acid	100 ml	PM
		Sulphuric Acid	50 ml	PM
2		Flimtec RO Membrane	3 Nos	PM
3		5 Micron RO Filter	1 No	PM
4		50 Micron RO Pre Filter	3 Nos	PM
5		Lifting Pump (Make Grundfos, Model: KP350)	1 No	BM
6	Feb 2019	RO anti scalant refilling	100 ml	PM
7		RO Acid refilling	50 ml	PM
8		Workshop Pre-filter 50 micron replaced	1 No	PM
9		RO Pre filter 50 Micron replaced	1 No	PM
10		RO 5 Micron cartridge filter replaced	1 No	PM
11	Mar 2019	RO anti scalant refilling	100 ml	PM
12		RO Acid refilling	50 ml	PM
13		Workshop Pre-filter 50 micron replaced	1 No	PM
14		RO 5 Micron cartridge filter replaced	1 No	PM
15	Apr 2019	RO anti scalant refilling	100 ml	PM
16		RO Acid refilling	50 ml	PM
17		Workshop Pre-filter 50 micron replaced	1	PM
18		RO 5 Micron cartridge filter replaced	1	PM
20		RO waste pit tank lifting pump damaged(Make –Grundfos	1 Nos	BM

		,Model-KP350)		
21		Toilet wash basin drain pipe changed	1 no	BM
22	May 2019	RO anti scalant refilling	100 ml	PM
23		RO Acid refilling	50 ml	PM
25		Station supply pump pressure vessel change(Pressure vessel reflex pump 8 litre)	1 Nos	BM
27	June 2019	RO anti scalant refilling	100 ml	PM
28		RO Acid refilling	50 ml	PM
29		RO waste pit tank lifting pump repairing Make –Grundfos ,Model-KP350)	1	BM
31	July 2019	RO anti scalant refilling	100 ml	PM
32		RO Acid refilling	50 ml	PM
34	Aug 2019	RO anti scalant refilling	100 ml	PM
35		RO Acid refilling	50 ml	PM
37		Calcite filling	10 kg	PM
41	Sep 2019	RO anti scalant refilling	100 ml	PM
42		RO Acid refilling	50 ml	PM
43		RO PH meter replaced(make-prominent,Model-DCCAS006PR0010DE)	1 No	BM
44	Oct 2019	RO anti scalant refilling	100 ml	PM
45		RO Acid refilling	50 ml	PM
46	Nov 2019	RO anti scalant refilling	100 ml	PM
47		RO Acid refilling	50 ml	PM
48	Dec 2019	RO anti scalant refilling	100 ml	PM
49		RO Acid refilling	50 ml	PM
53		RO 5 and 50 micron filter replacement	3 nos	PM
57	Jan 2020	RO anti scalant refilling	100 ml	PM
58		RO Acid refilling	50 ml	PM
59		RO 5 and 50 micron filter replacement	3 nos	PM
60		Workshop Pre-filter 50 micron replaced	2	PM
61		RO high pressure pump 2 installed(Danfoss app 1.0)	1	BM
62	Feb 2020	RO anti scalant refilling	100 ml	PM
63		RO Acid refilling	50 ml	PM
64		RO 5 and 50 micron filter replacement	3 nos	PM
66	Mar 2020	RO anti scalant refilling	100 ml	PM
67		RO Acid refilling	50 ml	PM
68		RO 5 and 50 micron filter	3 nos	PM

		replacement		
69		RO Pit pump damaged(Make-Grundfos,Model-Kp350)	1 No	BM
70	Apr 2020	RO anti scalant refilling	100 ml	PM
71		RO Acid refilling	50 ml	PM
72		RO 5 and 50 micron filter replacement	3 nos	PM
73		Workshop Pre-filter 50 micron replaced	2	PM
76	May 2020	RO anti scalant refilling	100 ml	PM
77		RO Acid refilling	50 ml	PM
78		RO 5 and 50 micron filter replacement	3 nos	PM
79		Workshop Pre-filter 50 micron replaced	1	PM
80	June 2020	RO anti scalant refilling	100 ml	PM
81		RO Acid refilling	50 ml	PM
82		RO 5 and 50 micron filter replacement	3 nos	PM
83		Workshop Pre-filter 50 micron replaced	1	PM
84		Fresh water buffer tank 1 level sensor problem(Make-fisher,part no-110129)	1 No	BM
85	July 2020	RO anti scalant refilling	100 ml	PM
86		RO Acid refilling	50 ml	PM
87		RO 5 and 50 micron filter replacement	3 nos	PM
88		Workshop Pre-filter 50 micron replaced	1	PM
98	Aug 2020	RO anti scalant refilling	100 ml	PM
99		RO Acid refilling	50 ml	PM
100		RO 5 and 50 micron filter replacement	3 nos	PM
101		Workshop Pre-filter 50 micron replaced	1	PM
102	Sep 2020	RO anti scalant refilling	100 ml	PM
103		RO Acid refilling	50 ml	PM
104		RO 5 and 50 micron filter replacement	3 nos	PM
105		Workshop Pre-filter 50 micron replaced	1	PM
106	Oct 2020	RO anti scalant refilling	100 ml	PM
107		RO Acid refilling	50 ml	PM
108		Workshop Pre-filter 50 micron replaced	1	PM

110	Nov 2020	RO anti scalant refilling	100 ml	PM
111		RO Acid refilling	50 ml	
112		Workshop Pre-filter 50 micron replaced	1	PM
113		RO 5 and 50 micron filter replacement	3	PM
114		RO repaired pit tank pump damaged(Make-Grundfos,Model-KP350)	1	BM
115	Dec 2020	RO anti scalant refilling	100 ml	PM
116		RO Acid refilling	50 ml	PM
117		RO 5 and 50 micron filter replacement	3	PM
118		Workshop Pre-filter 50 micron replaced	1	PM
127	Jan 2021	RO anti scalant refilling	100 ml	PM
128		RO Acid refilling	50 ml	PM
129		RO 5 and 50 micron filter replacement	3	PM
130		Workshop Pre-filter 50 micron replaced	1	PM
132	Feb 2021	RO anti scalant refilling	100 ml	PM
133		RO Acid refilling	50 ml	PM
134		RO 5 and 50 micron filter replacement	3	PM
135		Workshop Pre-filter 50 micron replaced	1	PM
137	Mar 2021	RO anti scalant refilling	100 ml	PM
138		RO Acid refilling	50 ml	PM
139		RO 5 and 50 micron filter replacement	3	PM
140		Workshop Pre-filter 50 micron replaced	1	PM
141	Apr 2021	RO anti scalant refilling	100 ml	PM
142		RO Acid refilling	50 ml	PM
143		RO 5 and 50 micron filter replacement	3	PM
144		Workshop Pre-filter 50 micron replaced	1	PM
145	May 2021	RO anti scalant refilling	100 ml	PM
146		RO Acid refilling	50 ml	PM
147		RO 5 and 50 micron filter replacement	3	PM
148		Workshop Pre-filter 50 micron replaced	1	PM
151		RO acid dosing pump failure	1	BM



		issue(Make-ILT construction GmbH,Model-KMSADC200,5EP,230V AC)		
152	June 2021	RO anti scalant refilling	100 ml	PM
153		RO Acid refilling	50 ml	PM
154		RO 5 and 50 micron filter replacement	3	PM
155		Workshop Pre-filter 50 micron replaced	1	PM
156	July 2021	RO anti scalant refilling	100 ml	PM
157		RO Acid refilling	50 ml	PM
158		RO 5 and 50 micron filter replacement	3	PM
159		Workshop Pre-filter 50 micron replaced	1	PM
170	Aug 2021	RO anti scalant refilling	100 ml	PM
171		RO Acid refilling	50 ml	PM
172		RO 5 and 50 micron filter replacement	3	PM
173		Workshop Pre-filter 50 micron replaced	1	PM
174	Sep 2021	RO anti scalant refilling	100 ml	PM
175		RO Acid refilling	50 ml	PM
176		RO 5 and 50 micron filter replacement	3	PM
177		Workshop Pre-filter 50 micron replaced	1	PM
178	Oct 2021	RO anti scalant refilling	100 ml	PM
179		RO Acid refilling	50 ml	PM
180		RO 5 and 50 micron filter replacement	3	PM
181		Workshop Pre-filter 50 micron replaced	1	PM
182	Nov 2021	RO anti scalant refilling	100 ml	PM
183		RO Acid refilling	50 ml	PM
184		RO 5 and 50 micron filter replacement	3	PM
185		Workshop Pre-filter 50 micron replaced	1	PM
195	Dec 2021	RO anti scalant refilling	100 ml	PM
196		RO Acid refilling	50 ml	PM
197		RO 5 and 50 micron filter replacement	3	PM
198		Workshop Pre-filter 50 micron replaced	1	PM
199		Workshop area lifting pump	1 No	BM

		failure issue(Make-ROBUSTA 202 W/TS)		
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**4.Air Handling Unit Spare consumption from Jan 2019 – Dec 2021**

Sr. No	Month	Spare	Quantity	Periodic Maintenance/ Breakdown Maintenance
1	Jan 2019	Softner unit resin change	30Kg	PM
2		AHU Return fan timer relay damaged (miniature timer relay)	01	BM
3	FEB 2019	Softner unit resin change	25Kg	PM
4	MAR 2019	Softner unit resin change	30Kg	PM
5	APR 2019	Softner unit resin change	25Kg	PM
6	MAY 2019	Softner unit resin change	25Kg	PM
7	JUNE 2019	Softner unit resin change	30Kg	PM
8	JULY 2019	Softner unit resin change	30Kg	PM
9	AUG 2019	Softner unit resin change	25Kg	PM
10		Supply & exhaust air filter changed	01	PM
11	SEPT 2019	Softner unit resin change	25Kg	PM
12		AHU humidifier pump replaced	01	BM
13		AHU supply pump changed	01	BM
14	OCT 2019	Softner unit resin change	30Kg	PM
15	NOV 2019	Softner unit resin change	25Kg	PM
16		-18 Refrigerator refrigerant leakage problem	01	BM
17	DEC 2019	Softner unit resin change	30Kg	PM
18		AHU Fans, heater, rotary heat exchanges, damper, valves, fire damper leaf damper checking for contamination, corrosion, damage	01	PM
19	JAN 2020	Softner unit resin change	30Kg	PM
20		NEW humidifier mesh installed	01	PM
21	FEB 2020	Softner unit resin change	30Kg	PM
22	MAR 2020	Softner unit resin change	25Kg	PM
23	APRIL 2020	Softner unit resin change	25Kg	PM
24	MAY 2020	Softner unit resin change	30Kg	PM
25	JUNE 2020	Softner unit resin change	35Kg	PM
26		AHU humidifier pump changed( Brinkmann pump model no- 58791	01	BM
27	JULY 2020	Softner unit resin change	30Kg	PM
28		Supply & exhaust air filter changed	01	PM
29	AUG 2020	Softner unit resin change	25Kg	PM

30	SEPT 2020	Softner unit resin change	25Kg	PM
31	OCT 2020	Softner unit resin change	25Kg	PM
32		AHU return air fan VFD fault(Danfoss-13u0980,2.2kw)	01	BM.
33	NOV 2020	Softner unit resin change	30Kg	PM
34	DEC 2020			
35		AHU supply,return& separate exhaust air filter change	01	PM
36	JAN 2021	Softner unit resin change	30Kg	PM
37		AHU Fans, heater,rotary heat exchanges, damper,valves, fire damper leaf damper checking for contamination,corrosion,damage	01	PM
38	FEB 2021	Softner unit resin change	30Kg	PM
39	MAR 2021	Softner unit resin change	30Kg	PM
40	APRIL 2021	Softner unit resin change	30Kg	PM
41		De aeraqation line exhaust blower installation (helios blower fan type-sb125a	01	BM
42	MAY 2021	Softner unit resin change	30Kg	PM
43	JUNE 2021	Softner unit resin change	25Kg	PM
44	JULY 2021	Softner unit resin change	25Kg	PM
45		Supply & exhaust air filter changed	01	PM
46	AUG 2021	Softner unit resin change	30Kg	PM
47	SEPT 2021	Softner unit resin change	30Kg	PM
48	OCT 2021	Softner unit resin change	30Kg	PM
49	NOV 2021	Softner unit resin change	30Kg	PM
50		Humidifier water tray cleaning	01	PM
51	DEC 2021	Softner unit resin change	25Kg	PM

#### **5.Fuel farm Spare consumption from Jan 2019 – Dec 2021**

Sr. No	Month	Spare	Quantity	Periodic Maintenance/ Breakdown Maintenance
1	Jan 2019	Water separator filter replacement in fuel farm(Faudi 2"Monitor element M.2-770/6: 4nos and FaudiSeperator element 60.655-842/D: 1no and Faudi coalesce p.3-727: 1no)		
2	Feb 2019	Nitrogen top up of fuel line( 1 Nitrogen cylinder)	1 No	
3	Feb 2020	Water separator filter replacement in fuel farm(Faudi 2"Monitor element M.2-770/6:		

		4nos and FaudiSeperator element 60.655-842/D: 1no and Faudi coalesce p.3-727: 1no)		
4		Nitrogen top up of fuel line( 1 Nitrogen cylinder)	1 No	
5	Jan 2021	Water separator filter replacement in fuel farm(Faudi 2''Monitor element M.2-770/6: 4nos and FaudiSeperator element 60.655-842/D: 1no and Faudi coalesce p.3-727: 1no)		
6		Nitrogen top up of fuel line( 1 Nitrogen cylinder)	1 No	

#### **6.Electrical Spare consumption from Jan 2019 – Dec 2021**

Sr. No	Month	Spare	Quantity	Periodic Maintenance/ Breakdown Maintenance
1	Jan 2019	Fused CFL,Ballast,Tubes and bulb	CFL-4 Ballast-2 Tube-3	BM
2	Feb 2019	Fused CFL,Ballast,Tubes and bulb	CFL-3 Ballast-1 Tube-1	BM
3	Mar 2019	Fused CFL,Ballast,Tubes and bulb	CFL-4 Ballast-1 Tube-2	BM
4	Apr 2019	Fused CFL,Ballast,Tubes and bulb	CFL-2 Ballast-4 Tube-2	BM
5		Shredder/crusher installation	5 meter 1.5sqmm 5 core cable 5pin industrial plug-1no	
6	May 2019	Fused CFL,Ballast,Tubes and bulb	CFL-6 Ballast-2 Tube-3	BM
7	June 2019	Fused CFL,Ballast,Tubes and bulb	CFL-4 Ballast-1 Tube-2	BM
8		Changed 12 rooms sockets from European style to universal style	48 universal	

			sockets	
9	July 2019	Fused CFL,Ballast,Tubes and bulb	CFL-2 Ballast-1 Tube-2	BM
10	Aug 2019	Fused CFL,Ballast,Tubes and bulb	CFL-4 Ballast-2 Tube-0	BM
11		Check for contamination damage and proper fixing of MLVD panel		PM
12		Multi functional controller and emergency lightning duration and functional testing	8 batteries	PM
13		UPS 1 and 2 maintenance		PM
14		Change over and monitoring module UMC107E for medical IT system function test		PM
15	Sep 2019	Fused CFL,Ballast,Tubes and bulb	CFL-4 Ballast-2 Tube-1	BM
16	Oct 2019	Fused CFL,Ballast,Tubes and bulb	CFL-4 Ballast-1 Tube-2	BM
17	Nov 2019	Fused CFL,Ballast,Tubes and bulb	CFL-4 Ballast-2 Tube-2	BM
18	Dec 2019	Fused CFL,Ballast,Tubes and bulb	CFL-4 Ballast-2 Tube-2	BM
19		All AC air filter cleaned		
20		Multi functional controller and emergency lightning duration and functional testing	17 batteries	PM
21		UPS 1 and 2 testing done		PM
22	Jan 2020	Fused CFL,Ballast,Tubes and bulb	CFL-3 Ballast-0 Tube-2	BM
23	Feb 2020	Fused CFL,Ballast,Tubes and bulb	CFL-1 Bulb-2 Tube-4	BM
24	Mar 2020	Fused CFL,Ballast,Tubes and bulb	CFL-0 Ballast-0 Tube-1	BM
25	Apr 2020	Fused CFL,Ballast,Tubes and bulb	CFL-3 Ballast-0 Tube-2	BM
26		3 pin socket changed	36nos	BM

27	May 2020	Fused CFL,Ballast,Tubes and bulb	CFL-1 Bulb-2 Tube-1	BM
28	July 2020	Fused CFL,Ballast,Tubes and bulb	CFL-2 Bulb-2 Tube-1	BM
29		Multi functional controller and emergency lightning duration and functional testing		PM
30		UPS 1 and 2 maintenance		PM
31	Aug 2020	Fused CFL,Ballast,Tubes and bulb	CFL-2 Bulb-0 Tube-1	BM
32	Sep 2020	Fused CFL,Ballast,Tubes and bulb	CFL-2 Bulb-2 Tube-1	BM
33	Oct 2020	Fused CFL,Ballast,Tubes and bulb	CFL-5 Bulb-1 Tube-1 Choke-4	BM
34	Dec 2020	Fused CFL,Ballast,Tubes and bulb	CFL-2 Bulb-4 Tube-2	BM
35		emergency lightning duration and functional testing		
36	Jan 2021	Fused CFL,Ballast,Tubes and bulb	CFL-3 Ballast-5 Tube-2	BM
37		All AC air filter cleaned		PM
38		Multi functional controller and emergency lightning duration and functional testing		PM
39		UPS 1 and 2 testing done		PM
40	Feb 2021	Fused CFL,Ballast,Tubes and bulb	CFL-2 Ballast-0 Tube-1	BM
41	Mar 2021	Fused CFL,Ballast,Tubes and bulb	CFL-3 Ballast-0 Tube-1	BM
42	Apr 2021	Fused CFL,Ballast,Tubes and bulb	CFL-2 Ballast-0 Tube-0	BM
43	May 2021	Fused CFL,Ballast,Tubes and bulb	CFL-2 Ballast-0 Tube-2	BM
44	June 2021	Fused CFL,Ballast,Tubes and bulb	CFL-2	BM

			Ballast-0 Tube-2	
45	July 2021	Fused CFL,Ballast,Tubes and bulb	CFL-7 Ballast-1 Tube-2 Choke-3	BM
46		Multi functional controller and emergency lightning duration and functional testing		PM
47		UPS 1 and 2 testing done		PM
48	Aug 2021	Fused CFL,Ballast,Tubes and bulb	CFL-2 Ballast-0 Tube-0	BM
49	Sep 2021	Fused CFL,Ballast,Tubes and bulb	CFL-5 Ballast-0 Tube-1	BM
50	Oct 2021	Fused CFL,Ballast,Tubes and bulb	CFL-2 Ballast-0 Tube-3	BM
51	Nov 2021	Fused CFL,Ballast,Tubes and bulb	CFL-3 Ballast-0 Tube-2	BM
52		LED tubelight installation	52 nos	
53		Multi functional controller and emergency lightning duration and functional testing		PM
54	Dec 2021	Fused CFL,Ballast,Tubes and bulb	CFL-2 Ballast-2 Tube-3	BM

### **7.Miscellaneous Spare consumption from Jan 2019 – Dec 2021**

Sr. No	Month	Spare	Quantity	Periodic Maintenance/ Breakdown Maintenance
1	FEB 2019	-18 Deep fridge relay changed	1	PM
	DEC 2019	Glycol Leakage in static heater	Washer ring (Part no : 1016845) : 1 nos	BM
	JAN 2020	Station glycol top up	1200 Liters	PM
	FEB 2020	Station glycol top up	Propylene Glycol : 200 liters	PM
		Temperature issue in cold	Relay 1 no	BM

		storage kitchen (+4 degree)		
	MAR 2020	Bathroom shower hose replacement	Hose make :Grohe part no 28410000 : 2 nos	PM
	APR 2020	Sea Water Intake pump 1 line brass ball valve damaged	Brass ball valve : 1 no	BM
		Sea water intake pump 2 cable short circuit fault	1.5 m cable connector with new one (make : Grundfos , part no : VDE-REG 8008) : 1 No	BM
	JAN 2021	Station glycol top up	Propylene glycol : 100 liter	PM
	FEB 2021	Kitchen basin hose with handle replacement with new one	Hose with handle : 1 no	BM
	MAR 2021	All station fire extinguisher checking and replaced wherever required	New extinguisher used : 1 nos	PM