



HLL Biotech Limited

(Subsidiary of HLL Lifecare Limited)

(A Government of India Enterprise)

January 2021

HBL is a 100% Subsidiary Company of **HLL Lifecare Limited (HLL)**, A **Government of India (GOI)** Enterprise under the **Ministry of Health and Family Welfare (MoHFW)**.

HBL is implementing a project of national importance to establish an **Integrated Vaccine Complex (IVC)** in **Chengalpattu near Chennai**.

IVC – A Project of National Importance

- IVC has been declared as “a **Project of National Importance**” by GOI.
- IVC is a **State-of-the-Art cGMP compliant** centralized vaccine manufacturing facility.
- IVC has been granted with a **Captive Status to cater 75% of vaccine procurements** for UIP.

Vaccines & Capacities Proposed for IVC as per approval

Vaccines	Planned Capacity / Annum (MD)	Annual UIP Requirements (MD)	Captive Status Eligibility (MD)
Hepatitis B	140	40	30
Pentavalent (DPT+Hep B+Hib)	100	88	66
Measles / Rubella (MR)	100	72	54
BCG	100	130*	50
Hib (Only as a Component of Pentavalent)	100	-	-
JE	25	50	37.5
Rabies	20	35#	8

* UNICEF requirements to meet global demand

Indian market requirements

MD = Million Doses

Implementation of the IVC Project

- 1 Project Consultant: **NNE Pharmaplan** – Conceptual Designing, Basic Engineering , Detailed engineering and Validation support.
- 2 Project construction **commenced by 21st September 2013** and **completed by June 2017**.
- 3 IVC is established in **100 Acres** of land with a built-up area of **63,990 sqm**.
- 4 One block of Formulation & Fill-Finish and Secondary Packaging along with supportive QC Labs, Engg & Utility Services and Warehouse have been commissioned, validated and qualified.

Current Status

- Production blocks are established , equipment installed, engineering activities with clean room infrastructure is ready.
- Cost and time over run during the project implementation delayed commissioning and validation activities
- Additional project fund is requested for completing the commissioning and validation activities
- Revised project proposal for operationalizing IVC by priority wise production of vaccines is submitted to Govt. for consideration
- Considering the current COVID-19 situation, revival of IVC having strategic importance for making available COVID-19 vaccines and other vaccines of national interest.

Current Status

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Facility	Operations / Functions	Current Status			
		Civil, Mech, & Electrical	Equipment Installation	Commissioning	Validation
IVC Overall Project with Built-Up Area of 63,990 SQM		Done	~75% Done	~75% Done	~20% Done*
Production (Excepting MR Block, under hold)	Bulk Production – 5 Vaccines	Done	~50%Done*	~50%Done*	Pending
	Formulation & Fill-Finish – 5 Vaccines	Done	~75% Done*	~75% Done*	~25% Done*
	Labeling & Packaging	Done	Done	Done	Done
	Supporting & Services	Done	Done	Done	Done
Quality Control	In Vitro Testing	Done	Done	Done	Pending
	Animal Breeding & Testing (In Vivo)	Done	Pending	Pending	Pending
Warehouse		Done	Done	Done	Pending
Utilities & Engineering Services	Power,Air,Water,Steam,Chilled Water, etc.	Done	Done	Done	~50% Done*
	Raw Water Treatment & Fire Hydrant	Done	Done	Done	Done
	ETP &STP	Done	Pending	Pending	Pending
QA & RA	QA, RA & Pharmacovigilance	Done	Done	NA	NA
Admin, Finance, SCM, IT, Marketing, etc.		Done	~80% Done	Done	NA

Statutory Approvals, Licensures & Registrations

Approvals

PCB Consent for Air - 28/03/2016

PCB Consent for Water - 28/03/2016

Registrations

CPCSEA Registration - 23/11/2017

Committees

IAEC - Year 2017

IBSC - Year 2018

Licensures

Sl. No.	Product	Type of License /Permission
1.	Liquid Pentavalent Vaccine (DTwP+Hep B+Hib) – Ready to Fill (RTF) Bulk	Test Manufacturing License in Form-29
2.	Japanese Encephalitis Vaccine	
3.	Rabies Vaccine, Human	
4.	BCG Vaccine	
5.	Oxytocin Injection I.P. 5 IU/mL	
6.	<ul style="list-style-type: none"> PENTAHIL (Liquid Pentavalent Vaccine) and HIVAC B (Hepatitis B r-DNA Vaccine) 	Loan License in Form-28DA for Manufacture at Loaned Facility at Biological E Limited – Hyderabad
7.	<ul style="list-style-type: none"> PENTAHIL (Liquid Pentavalent Vaccine) and HIVAC B (Hepatitis B r-DNA Vaccine) 	Manufacture License in Form-28D for Labeling and Packing at IVC, Chengalpattu

Technology for Vaccines

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Sl.No.	Vaccine	Technology Status
1	Hepatitis B	Production scale technology transfer - agreement signed with Biological E Ltd, Hyderabad in 2013.
2	Pentavalent	Ready to Fill (RTF) Bulk supply agreement signed with Biological E, Hyderabad in 2013.
3	BCG	Agreement signed with BCG Vaccine Laboratory, Guindy, Chennai for vaccine seed and technology transfer and training.
4	JE	Agreement signed with NIV, Pune for seed transfer to develop vaccine by HBL .
5	Rabies	Lab scale development completed using R&D seed virus from CDC, Atlanta. Identified a Lab for approved seed procurement.
6	Hib Bulk	In-house technology development using clinical isolate from CMC Vellore is in progress.
7	Measles	On hold; yet to finalize technology partner.

IVC - Aerial View of the Plant Premises, 2016



State of the Art cGMP Vaccine Manufacturing Plant at IVC

Legend:

VVF = Viral Vaccine Formulation

BVF = Bacterial Vaccine Formulation

CL & CR = Central Laundry & Change Room

IVC Plant Premises

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Functional Blocks	Block Name (Original)	Vaccine / Operations
Production Blocks	Antigen Bulk Production Blocks	
	1. Rabies Block	Rabies & JE Antigen Bulk Production
	2. MR Block	Measles & Rubella Antigen Bulk Production
	3. MBB Block	Hep B & Hib Antigen Bulk Production
	Formulation and Fill-Finish Blocks	
	4. BVF Block (Only Liquid Products)	Liquid Pentavalent & Hep B
	5. VVF Block (Liquid & Lyophilized Products)	Line-1: Rabies & JE
		Line-2: Measles & Rubella combined product
	Antigen Bulk Production, Formulation and Fill-Finish Blocks	
	6. BCG Block	BCG Antigen Bulk, Formulation & Fill-Finish
	Secondary Packaging Block	
	7. Secondary Packaging Block	Labeling & Packing of all vaccine products
	Service Block	
	8. Central Laundry & Canteen Block	Entry, Primary Gowning, Exit, Central Laundry & Canteen Services

IVC Plant Premises

Functional Blocks	Block Name (Original)	Vaccines / Operations
Testing Blocks	15. QC Lab (II Floor of Central Main Block)	<i>In vitro</i> testing of all vaccines (FGs, Antigen Bulk, In-Process Controls, RM & PM testing)
	9. Animal House	Animal breeding & <i>In vivo</i> testing of all vaccines (FGs, Antigen Bulk & In-Process Controls)
Warehouse	10. Warehouse	All Goods Receipts, Storage & Distribution
Utilities	11. Utility Block	Engineering & Utility Services
	12. Raw Water Treatment Plant & Fire Hydrant Tank	RW Storage, purification & distribution
ETP & STP	13. ETP & STP Plants	Effluent & sewerage collection, treatment and disposal
Substation	14. Power Substation	110 KV Power Substation
Central Main Block	15. Admin, Finance, SCM, IT & Marketing – Ground Floor	Admin, Finance, SCM, IT & Marketing
	15. QA – 1 st Floor	Quality Assurance
	15. QC – 2 nd Floor	Quality Control Laboratories
Canteen	8. Central Laundry & Canteen	Central Canteen Services
Security	16. Security & Time Office	Security Services, Time Office & Parking Lots

Liquid vaccine formulation unit

- Installed capacity : 200 vials per minute
- Facility is commissioned and validated
- Formulation and filling shall be started after re-validation
- Suitable for formulation and filling of liquid vaccine.
- Revalidation is needed to start operation



LIQUID VACCINE FORMULATION & FILLING

ELEVATION



STERILIZER



FORMULATION & BLENDING



FILLING



List of Equipment

Sl.No	Equipment Name	Vendor name
1	CIP station	Praj Hipurity System ltd
2	Buffer preparation vessel	Praj Hipurity System ltd
3	Mixing Vessel	Praj Hipurity System ltd
4	Pressure Vessel	Praj Hipurity System ltd
5	Blending Vessel	Bangalore biotech labs pvt Ltd
6	Vial filling machine	Rota
7	Sterilization Autoclave	Indo German
8	Decontamination Autoclave	Indo German
9	Vial Washer	Klenzaids contamination controls pvt ltd
10	Depyrogenation Tunnel	Klenzaids contamination controls pvt ltd
11	Vial Sealing Machine	Klenzaids contamination controls pvt ltd
12	C-LAF	Klenzaids contamination controls pvt ltd
13	Dynamic passbox (infeed)	Klenzaids contamination controls pvt ltd
14	Dynamic passbox (outfeed)	Klenzaids contamination controls pvt ltd
15	Filter housings	Merck Life science Pvt Ltd
16	Filter housings	Merck Life science Pvt Ltd
17	Filter housings	Merck Life science Pvt Ltd
18	Filtration Train	Merck Life science Pvt Ltd
19	Filter Integrity machine	Merck Life science Pvt Ltd
20	Filter Integrity machine	Merck Life science Pvt Ltd
21	Infeed inspection with vial pusher	Klenzaids contamination controls pvt ltd
22	Sealing outfeed conveyour collection tray with DPB	Klenzaids contamination controls pvt ltd

Freeze dried Vaccine Formulation Unit

- Two dedicated formulation and filling suites
- Two filling machines: 200 vials per minute, each
- Two Lyophilizer (Freeze drier) 20 sq.m and 10 sq.m capacity.
- Facility is established and commissioned.
- The cleanroom facility and equipment's require validation before stating the production activity
- Suitable for production of freeze dried vaccines.



FREEZE DRIED VACCINE FORMULATION & FILLING

ELEVATION



WASHING TUNNEL



STERILIZER



FILLING



List of Equipment : Freeze Dried Vaccine Formulation Unit 1

Sl.No	Equipment Name	Vendor name
1	Blending Vessel	Bangalore biotech labs pvt Ltd
2	CIP station	Praj Hipurity System ltd
3	Buffer preparation vessel	Praj Hipurity System ltd
4	Lyophilizer-10	IMA
5	LYO Tank	Praj Hipurity System ltd
6	pressure vessel	Praj Hipurity System ltd
7	Pressure Vessel	Praj Hipurity System ltd
8	Pressure Vessel	Praj Hipurity System ltd
9	Vial filling machine	Rota
10	Sterilization Autoclave	Indo German
11	Decontamination Autoclave	Indo German
12	Dry Heat Sterilizer	Metal Chem
13	Vial Washer	Klenzaids contamination controls pvt ltd
14	Depyrogenation Tunnel	Klenzaids contamination controls pvt ltd
15	Vial Sealing Machine	Klenzaids contamination controls pvt ltd
16	C-LAF	Klenzaids contamination controls pvt ltd
17	Dynamic passbox (infeed)	Klenzaids contamination controls pvt ltd
18	Dynamic passbox (outfeed)	Klenzaids contamination controls pvt ltd
19	Filter housings	Merck Life science Pvt Ltd
20	Filter housings	Merck Life science Pvt Ltd
21	Filter housings	Merck Life science Pvt Ltd
22	Filter Integrity machine	Merck Life science Pvt Ltd

List of Equipment : Freeze Dried Vaccine Formulation Unit 2

Sl.No	Equipment Name	Vendor name
1	pressure vessel	Praj Hipurity System Ltd
2	Pressure Vessel	Praj Hipurity System Ltd
3	Pressure Vessel	Praj Hipurity System Ltd
4	Blending Vessel	Bangalore biotech labs pvt Ltd
5	Lyophilizer-20	IMA
6	Vial filling machine	Rota
7	Sterilization Autoclave	Indo German
8	Decontamination Autoclave	Indo German
9	Vial Washer	Klenzaid's contamination controls pvt ltd
10	Depyrogenation Tunnel	Klenzaid's contamination controls pvt ltd
11	Vial Sealing Machine	Klenzaid's contamination controls pvt ltd
12	C-LAF	Klenzaid's contamination controls pvt ltd
13	Dynamic passbox (infeed)	Klenzaid's contamination controls pvt ltd
14	Dynamic passbox (outfeed)	Klenzaid's contamination controls pvt ltd
15	Filter housings	Merck Life science Pvt Ltd
16	Filter housings	Merck Life science Pvt Ltd
17	Filter housings	Merck Life science Pvt Ltd
18	Filter Integrity machine	Merck Life science Pvt Ltd

Bulk & Formulation Unit

- Suitable for bulk production and formulation & filling
- Filling machine : 200 Vials per Minute
- Lyophilizer: 10 sq.m
- Facility is established and equipment installed; commissioning and validation activities pending.
- Production activities can start after completing commissioning and validation
- Suitable for liquid as well as freeze dried vaccines with required segregation



BULK & FORMULATION BLOCK



ELEVATION



DEPYROGENATION
TUNNEL



FILLING & LYOPHILIZATION



LYOPHILIZER

List of Equipment

Sl.No	Equipment Name	Vendor name
1	Buffer preparation vessel	Praj Hipurity System Ltd
2	Media preparation vessel	Praj Hipurity System Ltd
3	Mobile CIP trolley	Praj Hipurity System Ltd
4	Lyo tank	Praj Hipurity System Ltd
5	Pressure Vessel	Praj Hipurity System Ltd
6	Pressure Vessel	Praj Hipurity System Ltd
7	Lyophilizer-10	IMA
8	Sterilization Autoclave	Machin Fabrik
9	Sterilization Autoclave	Machin Fabrik
10	Decontamination Autoclave	Machin Fabrik
11	Decontamination Autoclave	Machin Fabrik
12	Dry Heat Sterilizer	Machin Fabrik
13	Filter Integrity machine	Merck Life science Pvt Ltd
14	Vial filling machine	Rota
15	Vial Washer	Klenzaids contamination controls pvt ltd
16	Depyrogenation Tunnel	Klenzaids contamination controls pvt ltd
17	Vial Sealing Machine	Klenzaids contamination controls pvt ltd

Tissue Culture based Viral vaccine bulk production unit

- Bulk production facility is established and commissioned with all equipment.
- Facility require validation before initiating the production activities.
- Technology transfer for the proposed vaccine- Rabies, JE or any other vaccine based on tissue culture method is awaited.

TISSUE CULTURE VACCINE- BULK PRODUCTION BLOCK

ELEVATION



CLEAN CORRIDOR



PREPARATION



FILTRATION



List of Equipment

Sl.No	Equipment Name	Vendor name
1	CIP station	Praj Hipurity System ltd
2	Buffer preparation vessel	Praj Hipurity System ltd
3	Media preparation vessel	Praj Hipurity System ltd
4	pressure vessel	Praj Hipurity System ltd
5	Pressure Vessel	Praj Hipurity System ltd
6	Pressure Vessel	Praj Hipurity System ltd
7	Pressure Vessel	Praj Hipurity System ltd
8	Pressure Vessel	Praj Hipurity System ltd
9	Pressure Vessel	Praj Hipurity System ltd
10	Pressure Vessel	Praj Hipurity System ltd
11	Pressure Vessel	Praj Hipurity System ltd
12	Pressure Vessel	Praj Hipurity System ltd
13	collection tank	Bangalore biotech labs pvt Ltd
14	Kill tank	Bangalore biotech labs pvt Ltd
15	Chromotography	GE health care bioscience ltd
16	Sterilization Autoclave	Indo German
17	Decontamination Autoclave	Indo German
18	Decontamination Autoclave	Indo German
19	Dry Heat Sterilizer	Metal Chem
20	Filter housings	Merck Life science Pvt Ltd
21	Ultra filtration system	Merck Life science Pvt Ltd
22	Filter Integrity machine	Merck Life science Pvt Ltd

Multiple Bulk production Unit

- Two dedicated production suites established with equipment for fermentation based bulk production of vaccine.
- Ideal facility for protein- polysaccharide based vaccine and genetic engineered clone based vaccine.
- Commissioning and validation activities pending for both the bulk production suites.

MULTIPLE BULK PRODUCTION BLOCK



List of Equipment : Multiple Bulk Production Unit 1

Sl.No	Equipment Name	Vendor name
1	Desoprtion vessel	Praj Hipurity System ltd
2	Adsoprtion vessel	Praj Hipurity System ltd
3	Adsoprtion vessel	Praj Hipurity System ltd
4	Adsoprtion vessel	Praj Hipurity System ltd
5	Filtration pressure Vessel	Praj Hipurity System ltd
6	Buffer hold Vessel	Praj Hipurity System ltd
7	Buffer hold Vessel	Praj Hipurity System ltd
8	PBD Vessel	Praj Hipurity System ltd
9	KCV vessel	Praj Hipurity System ltd
10	Areosol preparation vessel	Praj Hipurity System ltd
11	Harvest vessel	Praj Hipurity System ltd
12	Sublot vessel	Praj Hipurity System ltd
13	Sublot vessel	Praj Hipurity System ltd
14	Sublot vessel	Praj Hipurity System ltd
15	Media preparation vessel	Praj Hipurity System ltd
16	Buffer preparation vessel	Praj Hipurity System ltd
17	Buffer preparation vessel	Praj Hipurity System ltd
18	mobile CIP system	Praj Hipurity System ltd
19	Centralised CIP system	Praj Hipurity System ltd
20	CIT trolley	Praj Hipurity System ltd
21	CIT trolley	Praj Hipurity System ltd
22	Sterilization Autoclave	Machin Fabrik

List of Equipment : Multiple Bulk Production Unit 1

Sl.No	Equipment Name	Vendor name
23	Decontamination Autoclave	Machin Fabrik
24	Dry Heat Sterilizer	Machin Fabrik
25	Filter Integrity machine	Merck Life science Pvt Ltd
26	Filter Integrity machine	Merck Life science Pvt Ltd
27	Filter Integrity machine	Merck Life science Pvt Ltd
28	Ultra filtration system	Merck Life science Pvt Ltd
29	Ultra filtration system	Merck Life science Pvt Ltd
30	Sterile Filtration unit-	Merck Life science Pvt Ltd
31	Cell Disruption mill	WAB
32	Continous centrifuge	GEA Westfalia
33	Fermenter	Scigenics

List of Equipment : Multiple Bulk Production Unit 2

Sl.No	Equipment Name	Vendor name
1	Media preparation vessel	Praj Hipurity System Ltd
2	Buffer preparation vessel	Praj Hipurity System Ltd
3	Harvest vessel	Praj Hipurity System Ltd
4	product collection vessel	Praj Hipurity System Ltd
5	Centralised CIP system	Praj Hipurity System Ltd
6	CIT trolley	Praj Hipurity System Ltd
7	Decontamination Autoclave	Machin Fabrik
8	Decontamination Autoclave	Machin Fabrik
9	Dry Heat Sterilizer	Machin Fabrik
10	Continous centrifuge	GEA Westfalia
11	Filter Integrity machine	Merck Life science Pvt Ltd
12	Ultra filtration system	Merck Life science Pvt Ltd
13	Ultra filtration system	Merck Life science Pvt Ltd
14	Ultra filtration system	Merck Life science Pvt Ltd
15	Ultra filtration system	Merck Life science Pvt Ltd
16	Sterile Filtration unit-	Merck Life science Pvt Ltd
17	Sterile Filtration unit-	Merck Life science Pvt Ltd
18	Sterile Filtration unit-	Merck Life science Pvt Ltd
19	Chromotography	GE health care bioscience ltd
20	Chromotography	GE health care bioscience ltd
21	Fermenter	Scigenics

Supporting Facilities

- Administration, Quality Control & Quality Assurance Blocks
- Established, commissioned and validated and in use.
- Secondary packaging block
 - Facility for labelling, packing and storage of vaccine
 - Facility is commissioned and ready to use.
- Warehouse
 - Facility for material receipt, sampling and dispensing, storage etc.
 - Facility is commissioned and partly ready for use.
 - Pending validation of cleanroom
- Facility for experimental animal breeding and testing
 - Facility is established with all equipment
 - Pending for commissioning activity
- Utility Block
 - Facility for generation of utilities for the production facilities
 - Established and in use

ADMIN, QA & QC BLOCK



ELEVATION



FRONT OFFICE



CONFERENCE ROOM



WORK STATION

SPINE & ROADS



SECONDARY PACKAGING

ELEVATION



CLEAN CORRIDOR



LABELING



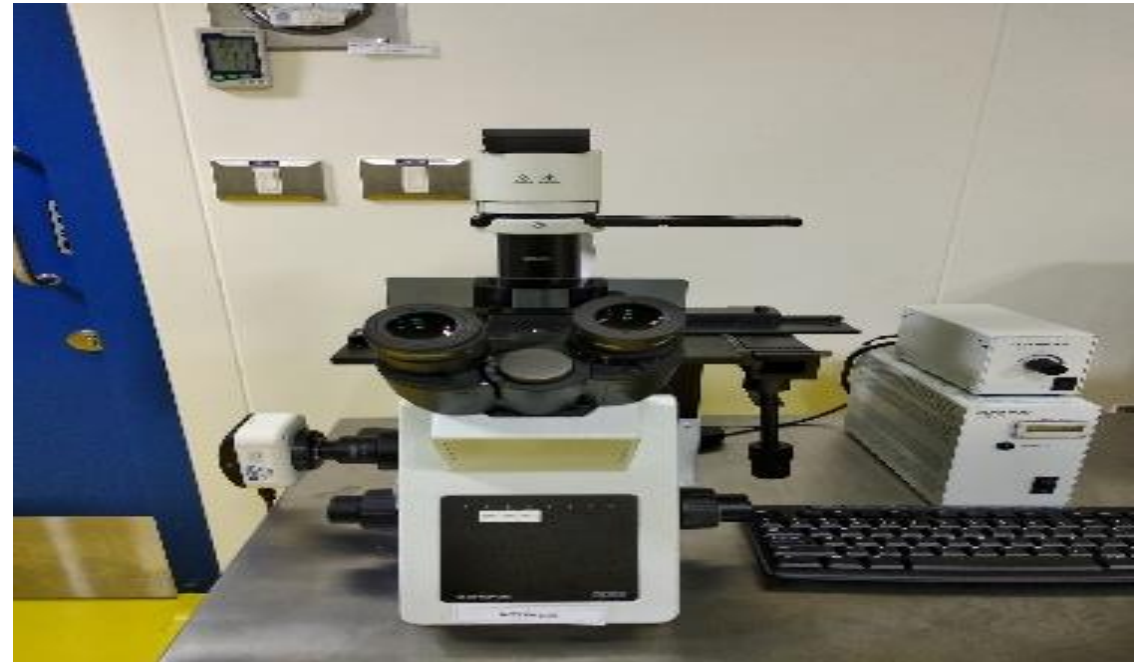
AHUs



QUALITY CONTROL FACILITY



QUALITY CONTROL FACILITY Contn



ANIMAL HOUSE



ELEVATION



CAGES



CORRIDOR



STERILIZER

ANIMAL HOUSE Contn

Inoculation Room, Challenge Area



Testing Lab, Challenge Area



WAREHOUSE

ELEVATION



RACKING



RACKING



COLD ROOM



UTILITY BLOCK

ELEVATION



BOILER



COOLING TOWER



**ELECTRICAL
PANEL**



110 KVA POWER STATION & HTDG

ELEVATION



TRANSFORMER YARD



HT PANEL ROOM



HTDG



RAW WATER & PRE-TREATMENT BLOCK

ELEVATION



RAW WATER TANK



PRE-TREATMENT



FIRE HYDRANT STATION



MANPOWER

Sl.No	Department	Number
1	Production	24
2	Testing	20
3	Quality Assurance	12
4	Engineering	61
5	Management, Finance, HR & Admin	14
6	Procurement	9
7	IT	5
8	Marketing	1
TOTAL		146