

# Technical Specification of Cold Chain Equipment



**Government of Nepal**  
**Ministry of Health and Population**  
**Department of Health Services**  
**Child Health Division, Logistics Management Division**  
**Teku, Kathmandu**

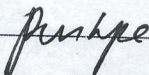
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This technical specification of cold chain equipment is a product of the hard work of a group of experts and professionals. I wish to extend my gratitude towards the specification development team for their dedication, input and for their commitment throughout the overall process of specification development.

The Child Health Division (CHD) and Logistics Management Division (LMD) deserve recognition for taking the lead and UNICEF, WHO and Lifeline Nepal are acknowledged for providing technical and financial assistance for this activity.

This document is a mandatory requirement for selection and procurement of standard and quality cold chain equipment. The correct storage and transportation of vaccine will thereby ensure its safety, leading to improvement of the cost-effectiveness of immunization services that rely on cold chain equipment.

  
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Dr. Pushpa Chaudhary  
Director General  
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These technical specifications for cold chain equipment were prepared jointly by the Child Health Division and the Logistics Management Division of the Department of Health Services (DoHS), with financial and technical support from UNICEF, WHO and Lifeline Nepal. A series of meetings and workshops resulted in the development of the specification of cold chain equipment.

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## Acronyms

CC	Cold Chain
CCO	Cold Chain Officer
CEO	Chief Executive Officer
CFC	Chlorofluorocarbon
CHD	Child Health Division
DC/A	Data Compilation/Analysis
DoHS	Department of Health Services
ILR	Ice Lined Refrigerator
IPD	Immunization Preventable Diseases
KVA	Kilo-Volt-Ampere
LCD/LED	Liquid Crystal Display/Light Emitting Diode
LMD	Logistics Management Division
NC	National Coordinator
NHSSP	Nepal Health Sector Support Program
PCA	Program Cooperation Agreement
PHA	Public Health Administrator
UNICEF	United Nations Children's Fund
WHO	World Health Organization
WIC	Walk In Cooler
WIF	Walk In Freezer
PV	Photovoltaics
KW	Kilowatt
USB	Universal Serial Bus

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## Background

Cold Chain maintenance is an essential component of every immunization programme, without which delivery of immunization services is rendered impossible. For the safe storage and transportation of vaccine, cold chain equipment is a mandatory requirement. All equipment must be able to keep vaccines safely whatever the outside temperature, and however the climate varies at different times of the year. This means it is vitally important to use well-made, reliable equipment that at the very least, meets the minimum standards determined by WHO for vaccine storage and transport.

Damaged and unusable vaccine, low levels of effective immunization coverage and unimmunized children are just a few of the consequences of procurement of low quality, poorly made cold chain equipment. It is also important to recognize that, given the ever-increasing price of vaccines and other time and temperature sensitive medical commodities, the procurement of sub-standard cold chain equipment that is unable to store and transport vaccine and other drugs safely invariably results in avoidable financial losses to the health system. Sourcing and procuring quality, dependable cold chain equipment is therefore critical in furthering the success and maintaining and improving the cost-effectiveness of health programmes that rely on cold chain equipment.

The technical specifications contained in this document cover the minimum required standards and level of quality for the cold chain equipment to be used and procured primarily for Nepal's National Immunization Programme, but may also be used to inform procurement for other programmes requiring cold chain equipment.

Any and all procurement of cold chain equipment of the types covered in this document by the Ministry of Health and Population and Department of Health Services must use these technical specifications for tendering and purchase. Failure to do so will result in the tender being rejected, and may lead to further consequences for the person(s) responsible for the development and submission of the tender.

## **Process of Development of Technical Specification of Cold Chain Equipment**

A workshop was held on the 29<sup>th</sup> May, 2015 for development of technical specification of cold chain equipment. Directors from the LMD and CHD, EPI officers, cold chain officers, engineers and other government and nongovernmental officials participated in the workshop. The list of participants of the workshop is provided in the annex. The draft specification developed by UNICEF Nepal was shared in the workshop.

Feedback and recommendations were generated from the group discussions throughout the workshop. As an outcome of this workshop, a technical team was assigned to review the draft of specification of cold chain equipment.

Following the workshop, a series of meetings were held for reviewing, discussing and validating the draft of cold chain equipment specification. The technical team of experts, engineers, and other officials reviewed the specification of cold chain equipment to make it technically sound. The team also adapted the specification into standard format which LMD had been using, thus bringing this document into its final shape.



## Specifications

### 1. Ice Lined Refrigerator

#### 1.1 Ice Lined Refrigerator (ILR) [Medium size, Long Holdover]

S.N.	Purchaser's Specifications
	<b>Ice Lined Refrigerator (ILR)</b>
	<b>Manufacturer</b>
	<b>Brand</b>
	<b>Type / Model</b>
	<b>Country of Origin</b>
<b>1</b>	<b>Description of Function</b>
1.1	Ice-lined refrigerators are used to store vaccine and maintain temperatures between +2°C to +8°C and able to run on (2.5-8) hours electricity per day.
<b>2</b>	<b>Operational Requirements</b>
2.1	Only one vaccine storage compartment.
<b>3</b>	<b>System Configuration</b>
3.1	Ice Lined Refrigerator (ILR), preferably single compartment, (minimum 40 litres) with suitable voltage stabiliser (as specified in 6.3).
<b>4</b>	<b>Technical Specifications</b>
4.1	Vaccine storage capacity: (40-75) litres with baskets or shelves in place.
4.2	Refrigerator compartment internal Gross Volume: minimum 40 litres.
4.3	<b>Construction:</b> <ul style="list-style-type: none"> <li>• Corrosion resistance: Internal and external cabinet, lid and frame protected against corrosion. Bidder to specify the materials used for construction of internal &amp; external cabinet.</li> <li>• CFC free insulation.</li> <li>• Door with lock and handle, preferably single door.</li> </ul>
4.4	<b>Refrigerant:</b> The refrigerator shall utilize CFC (Chlorofluorocarbon) free refrigerants,
4.5	<b>Holdover time:</b> The refrigerator shall maintain +2 °C to +10°C for minimum 48 hours during power cuts at the ambient temperature +43°C. <b>Preference will be given to longer holdover time.</b>
4.6	<b>Compressor:</b> <ul style="list-style-type: none"> <li>• Sealed heavy duty type.</li> <li>• Starts and operates on electricity supply from 165 to 255 volts.</li> </ul>
4.7	<b>Control Panel:</b> The thermostat, thermometer and other visual displays like On/Off switch, power indicator must be positioned.
<b>5</b>	<b>Accessories, spares and consumables</b>
5.1	<b>Accessories:</b> <ul style="list-style-type: none"> <li>• Vaccine Storage baskets (wires type) or shelves- minimum 2per unit.</li> <li>• External Reading Thermometer (mercury free) - one piece per unit range of -50 to +50 °C.</li> <li>• Integrated Digital Temperature display LCD/LED-01 (for displaying temperature inside the system and shall operate either electrically or solar power).</li> </ul>
5.2	<b>Spare parts:</b> Shall be included complete sets of spare parts in every 10 units (compressor, indicator, lights, thermostats, relay, fan, capacitor, door gaskets, etc.)

<b>S.N.</b>	<b>Purchaser's Specifications</b>
<b>6</b>	<b>Operating Environment</b>
6.1	The product offered shall be designed to be stored and to operate normally under Nepal's Power Supply, Climate, Temperature (+5 °C to +45 °C), low and high Humidity conditions
6.2	Unit Power supply: 220-240VAC, 50Hz fitted with appropriate plug. The power cable must be minimum 3 metres long. Power consumption: Preference will be given to less power consumption
6.3	<b>Voltage Stabiliser:</b> Voltage stabiliser unit to fit the refrigerator shall be included. Stabilizer to have the capacity of 1KVA, normally operating input voltage of 110-270V with delay timer of minimum 5 minutes.
<b>7</b>	<b>Standards and Safety Requirements</b>
7.1	Shall meet WHO Standard E3/RF.3.for Ice Lined Refrigerators or shall be WHO PQS certified product.
<b>8</b>	<b>User Training</b>
8.1	Must provide user training (including how to use and maintain the equipment).
<b>9</b>	<b>Warranty</b>
9.1	Comprehensive warranty for 2 years after acceptance.
<b>10</b>	<b>Maintenance Service During Warranty Period</b>
10.1	During the warranty period supplier must ensure corrective/breakdown maintenance whenever required.
<b>11</b>	<b>Installation and Commissioning</b>
11.1	The bidder must arrange for the equipment to be installed by certified or qualified personnel; any prerequisites for installation to be communicated to the purchaser in advance, in detail.
<b>12</b>	<b>Documentation</b>
12.1	User (Operating) manual in English.
12.2	Service (Technical / Maintenance) manual in English.
12.3	List of important spare parts and accessories with their part numbers and costing.
12.4	Certificate of calibration and inspection from factory.

## 1.2 Ice Lined Refrigerator (ILR) [Large size, Long Holdover]

S.N.	Purchaser's Specifications
	<b>Ice Lined Refrigerator (ILR)</b>
	<b>Manufacturer</b>
	<b>Brand</b>
	<b>Type / Model</b>
	<b>Country of Origin</b>
<b>1</b>	<b>Description of Function</b>
1.1	Ice-lined refrigerators are used to store vaccine and maintain temperatures +2°C to +8°C and able to run on (4-8) hours electricity per day.
<b>2</b>	<b>Operational Requirements</b>
2.1	Only one vaccine storage compartment.
<b>3</b>	<b>System Configuration</b>
3.1	Ice Lined Refrigerator (ILR), single compartment, (90 to 135 litres) with suitable voltage stabiliser (as specified in 6.3).
<b>4</b>	<b>Technical Specifications</b>
4.1	Vaccine storage capacity: Minimum 90 litres with baskets and shelves in place.
4.2	Refrigerator compartment internal Gross Volume: minimum 110 litres.
4.3	<b>Construction:</b> <ul style="list-style-type: none"> <li>• Corrosion resistance: Internal and external cabinet, lid and frame protected against corrosion. Bidder to specify the materials used for construction of internal &amp; external cabinet.</li> <li>• CFC free insulation.</li> <li>• Door with lock and handle.</li> </ul>
4.4	<b>Refrigerant:</b> The refrigerator shall utilize CFC (Chlorofluorocarbon) free refrigerants
4.5	<b>Holdover time:</b> The refrigerator shall maintain +2 °C to +8°C for minimum 48 hours during power cuts at the ambient temperature +43°C. <b>Preference will be given to longer holdover time.</b>
4.6	<b>Compressor:</b> <ul style="list-style-type: none"> <li>• Sealed heavy duty type.</li> <li>• Starts and operates on electricity supply from 165 to 255 volts.</li> </ul>
4.7	<b>Control Panel:</b> The thermostat, thermometer and other visual displays like On/Off switch, power indicator must be positioned.
<b>5</b>	<b>Accessories, spares and consumables</b>
5.1	<b>Accessories:</b> <ul style="list-style-type: none"> <li>• Vaccine Storage baskets (wires type) or shelves- minimum 2per unit.</li> <li>• External Reading Thermometer (mercury free) - one piece per unit range of -50 to +50 °C.</li> <li>• Integrated Digital Temperature display LCD/LED-01 (for displaying temperature inside the system and shall operate either electrically or solar power).</li> </ul>
5.2	<b>Spare parts:</b> Shall be included complete sets of spare parts in every 10 units (compressor, indicator, lights, thermostats, relay, fan, capacitor, door gaskets, etc.)
<b>6</b>	<b>Operating Environment</b>
6.1	The product offered shall be designed to be stored and to operate normally under Nepal's Power Supply, Climate, Temperature (+5 °C to +45 °C), low and high Humidity conditions
6.2	Unit Power supply: 220-240VAC, 50Hz fitted with appropriate plug. The power cable must be minimum 3 metres long. Power consumption: Preference will be given to less power consumption

<b>S.N.</b>	<b>Purchaser's Specifications</b>
6.3	<b>Voltage Stabiliser:</b> Voltage stabiliser unit to fit the refrigerator shall be included. Stabilizer to have the capacity of 2KVA, normally operating input voltage of 110-270V.
<b>7</b>	<b>Standards and Safety Requirements</b>
7.1	Shall meet WHO Standard E3/RF.3.for Ice Lined Refrigerator or shall be WHO PQS certified product.
<b>8</b>	<b>User Training</b>
8.1	Must provide user training (including how to use and maintain the equipment).
<b>9</b>	<b>Warranty</b>
9.1	Comprehensive warranty for 2 years after acceptance.
<b>10</b>	<b>Maintenance Service During Warranty Period</b>
10.1	During the warranty period supplier must ensure corrective/breakdown maintenance whenever required.
<b>11</b>	<b>Installation and Commissioning</b>
11.1	The bidder must arrange for the equipment to be installed by certified or qualified personnel; any prerequisites for installation to be communicated to the purchaser in advance, in detail.
<b>12</b>	<b>Documentation</b>
12.1	User (Operating) manual in English.
12.2	Service (Technical / Maintenance) manual in English.
12.3	List of important spare parts and accessories with their part numbers and costing.
12.4	Certificate of calibration and inspection from factory.

### 1.3 Ice Lined Refrigerator (ILR) [Short Holdover]

S.N.	Purchaser's Specifications
	<b>Ice Lined Refrigerator (ILR)</b>
	<b>Manufacturer</b>
	<b>Brand</b>
	<b>Type / Model</b>
	<b>Country of Origin</b>
<b>1</b>	<b>Description of Function</b>
1.1	Ice-lined refrigerators are used to store vaccine and maintain temperatures +2 °C to +8°C and able to run on minimum of (2.5 to 8) hours electricity per day.
<b>2</b>	<b>Operational Requirements</b>
2.2	Only one vaccine storage compartment.
<b>3</b>	<b>System Configuration</b>
3.1	Ice Lined Refrigerator (ILR), single compartment, (minimum 45 litres) with suitable voltage stabiliser (As specified in 6.3).
<b>4</b>	<b>Technical Specifications</b>
4.1	Vaccine storage capacity: (45-75) litres with baskets and shelves in place.
4.2	Refrigerator compartment internal Gross Volume: minimum 55 litres.
4.3	<b>Construction:</b> <ul style="list-style-type: none"> <li>• Corrosion resistance: Internal and external cabinet, lid and frame protected against corrosion. Bidder to specify the materials used for construction of internal &amp; external cabinet.</li> <li>• CFC free insulation.</li> <li>• Door with lock and handle.</li> </ul>
4.4	<b>Refrigerant:</b> The refrigerator shall utilize CFC (Chlorofluorocarbon) free refrigerants
4.5	<b>Holdover time:</b> The refrigerator shall maintain +2 °C to +10°C for minimum 24 hours during power cuts at the ambient temperature +43°C. <b>Preference will be given to longer holdover time.</b>
4.6	<b>Compressor:</b> <ul style="list-style-type: none"> <li>• Sealed heavy duty type.</li> <li>• Starts and operates on electricity supply from 165 to 255 volts.</li> </ul>
4.7	<b>Control Panel:</b> The thermostat, thermometer and other visual displays like On/Off switch, power indicator must be positioned.
<b>5</b>	<b>Accessories, spares and consumables</b>
5.1	<b>Accessories:</b> <ul style="list-style-type: none"> <li>• Vaccine Storage baskets (wires type) or shelves-minimum 2per unit.</li> <li>• External Reading Thermometer (mercury free) - one piece per unit range of -50 to +50 °C.</li> <li>• Integrated Digital Temperature display LCD/LED-01 (for displaying temperature inside the system and shall operate either electrically or solar power).</li> </ul>
5.2	<b>Spare parts:</b> Shall be included complete sets of spare parts in every 10 units (compressor, indicator, lights, thermostats, relay, fan, capacitor, door gaskets, etc.)
<b>6</b>	<b>Operating Environment</b>
6.1	The product offered shall be designed to be stored and to operate normally under Nepal's Power Supply, Climate, Temperature (+5 °C to +45 °C), low and high Humidity conditions.
6.2	Unit Power supply: 220-240VAC, 50Hz fitted with appropriate plug. The power cable must be minimum 3 metres long. Power consumption: Preference will be given to less power consumption

<b>S.N.</b>	<b>Purchaser's Specifications</b>
6.3	<b>Voltage Stabiliser:</b> Voltage stabiliser unit to fit the refrigerator shall be included. Stabilizer to have the capacity of 1KVA, normally operating input voltage of 110-270V with delay timer of minimum 5 minutes.
<b>7</b>	<b>Standards and Safety Requirements</b>
7.1	Shall meet WHO Standard E3/RF.3.for Ice Lined Refrigerators or shall be WHO PQS certified product.
<b>8</b>	<b>User Training</b>
8.1	Must provide user training (including how to use and maintain the equipment).
<b>9</b>	<b>Warranty</b>
9.1	Comprehensive warranty for 2 years after acceptance.
<b>10</b>	<b>Maintenance Service During Warranty Period</b>
10.1	During the warranty period supplier must ensure corrective/breakdown maintenance whenever required.
<b>11</b>	<b>Installation and Commissioning</b>
11.1	The bidder must arrange for the equipment to be installed by certified or qualified personnel; any prerequisites for installation to be communicated to the purchaser in advance, in detail.
<b>12</b>	<b>Documentation</b>
12.1	User (Operating) manual in English.
12.2	Service (Technical / Maintenance) manual in English.
12.3	List of important spare parts and accessories with their part numbers and costing.
12.4	Certificate of calibration and inspection from factory.

## 1.4 Ice Lined Refrigerator (ILR) [Double compartment, Short Holdover]

S.N.	Purchaser's Specifications
	<b>Ice Lined Refrigerator (ILR) double compartment</b>
	<b>Manufacturer</b>
	<b>Brand</b>
	<b>Type / Model</b>
	<b>Country of Origin</b>
<b>1</b>	<b>Description of Function</b>
1.1	Ice-lined refrigerators are used to store vaccine and maintain temperatures +2°C to +8°C and able to run on (4-8) hours electricity per day.
<b>2</b>	<b>Operational Requirements</b>
2.3	Double vaccine storage compartment with freezer and refrigerator.
<b>3</b>	<b>System Configuration</b>
3.1	Ice Lined Refrigerator (ILR), double compartment; (110 to 135 litres) for refrigerator and (40-50) for freezer compartment with suitable voltage stabiliser (As specified in 6.3).
<b>4</b>	<b>Technical Specifications</b>
<b>4.1</b>	<b>Refrigerator:</b>
4.1.1	Vaccine storage capacity: Minimum 60 litres with baskets and shelves in place.
4.1.2	Gross Volume: minimum 110 litres.
4.1.3	<b>Holdover time:</b> The refrigerator shall maintain +2 °C to +10°C for minimum 24 hours during power cuts at the ambient temperature +43°C. <b>Preference will be given to longer holdover time.</b>
4.1.4	<b>Compressor:</b> <ul style="list-style-type: none"> <li>• Sealed heavy duty type.</li> <li>• Starts and operates on electricity supply from 165 to 255 volts.</li> </ul>
<b>4.2</b>	<b>Freezer:</b>
4.2.1	Gross Volume: minimum 40 litres.
4.2.3	<b>Holdover time:</b> The unit shall maintain -15 °C to -25°C for minimum 24 hours during power cuts at the ambient temperature +43°C. <b>Preference will be given to longer holdover time.</b>
4.2.4	<b>Compressor:</b> <ul style="list-style-type: none"> <li>• Sealed heavy duty type.</li> <li>• Starts and operates on electricity supply from 165 to 255 volts.</li> </ul>
4.3	<b>Construction:</b> <ul style="list-style-type: none"> <li>• Corrosion resistance: Internal and external cabinet, lid and frame protected against corrosion. Bidder to specify the materials used for construction of internal &amp; external cabinet.</li> <li>• CFC free insulation.</li> <li>• Door with lock and handle, preferably double door</li> </ul>
4.4	<b>Refrigerant:</b> The refrigerator shall utilize CFC (Chlorofluorocarbon) free refrigerants
4.5	<b>Holdover time:</b> The refrigerator shall maintain +2°C to +10°C for minimum 24 hours during power cuts at the ambient temperature +43°C. <b>Preference will be given to longer holdover time.</b>
4.6	<b>Compressor:</b> <ul style="list-style-type: none"> <li>• Sealed heavy duty type.</li> <li>• Starts and operates on electricity supply from 165 to 255 volts.</li> </ul>
4.7	<b>Control Panel:</b> The thermostat, thermometer and other visual displays like On/Off switch, power indicator must be positioned.

<b>S.N.</b>	<b>Purchaser's Specifications</b>
<b>5</b>	<b>Accessories, spares and consumables</b>
5.1	<b>Accessories:</b> <ul style="list-style-type: none"> <li>• Vaccine Storage baskets (wires type) or shelves- minimum 4 per unit.</li> <li>• External Reading Thermometer (mercury free) - one piece per unit range of -50 to +50 °C.</li> <li>• Integrated Digital Temperature display LCD/LED-01 (for displaying temperature inside the system and shall operate either electrically or solar power).</li> </ul>
5.2	<b>Spare parts:</b> Shall be included complete sets of spare parts in every 10 units (compressor, indicator, lights, thermostats, relay, fan, capacitor, door gaskets, etc.)
<b>6</b>	<b>Operating Environment</b>
6.1	The product offered shall be designed to be stored and to operate normally under Nepal's Power Supply, Climate, Temperature (+5 °C to +45 °C), low and high Humidity conditions.
6.2	Unit Power supply: 220-240VAC, 50Hz fitted with appropriate plug. The power cable must be minimum 3 metres long. Power consumption: Preference will be given to less power consumption.
6.3	<b>Voltage Stabiliser:</b> Voltage stabiliser unit to fit the refrigerator shall be included. Stabilizer to have the capacity of 2KVA, normally operating input voltage of 110-270V.
<b>7</b>	<b>Standards and Safety Requirements</b>
7.1	Shall meet WHO Standard E3/RF.3 for Ice Lined Refrigerators or shall be WHO PQS certified product.
<b>8</b>	<b>User Training</b>
8.1	Must provide user training (including how to use and maintain the equipment).
<b>9</b>	<b>Warranty</b>
9.1	Comprehensive warranty for 2 years after acceptance.
<b>10</b>	<b>Maintenance Service During Warranty Period</b>
10.1	During the warranty period supplier must ensure corrective/breakdown maintenance whenever required.
<b>11</b>	<b>Installation and Commissioning</b>
11.1	The bidder must arrange for the equipment to be installed by certified or qualified personnel; any prerequisites for installation to be communicated to the purchaser in advance, in detail.
<b>12</b>	<b>Documentation</b>
12.1	User (Operating) manual in English.
12.2	Service (Technical / Maintenance) manual in English.
12.3	List of important spare parts and accessories with their part numbers and costing.
12.4	Certificate of calibration and inspection from factory.



## 1.5 Ice Lined Refrigerator (ILR) [Short Holdover]

S.N.	Purchaser's Specifications
	<b>Ice Lined Refrigerator (ILR)</b>
	<b>Manufacturer</b>
	<b>Brand</b>
	<b>Type / Model</b>
	<b>Country of Origin</b>
<b>1</b>	<b>Description of Function</b>
1.1	Ice-lined refrigerators are used to store vaccine and maintain temperatures +2°C to +8°C and able to run on more than 8 hours electricity per day.
<b>2</b>	<b>Operational Requirements</b>
2.1	Only one vaccine storage compartment.
<b>3</b>	<b>System Configuration</b>
3.1	Ice Lined Refrigerator (ILR), single compartment with suitable voltage stabiliser (As specified in 6.3).
<b>4</b>	<b>Technical Specifications</b>
4.1	Vaccine storage capacity: (125 -150) litres with baskets and shelves in place.
4.2	Refrigerator compartment internal Gross Volume: minimum 200 litres.
4.3	<b>Construction:</b> <ul style="list-style-type: none"> <li>• Corrosion resistance: Internal and external cabinet, lid and frame protected against corrosion. Bidder to specify the materials used for construction of internal &amp; external cabinet.</li> <li>• CFC free insulation.</li> <li>• Door with lock and handle.</li> </ul>
4.4	<b>Refrigerant:</b> The refrigerator shall utilize CFC (Chlorofluorocarbon) free refrigerants
4.5	<b>Holdover time:</b> The refrigerator shall maintain +2 °C to +10°C for minimum 24 hours during power cuts at the ambient temperature +43°C. <b>Preference will be given to longer holdover time.</b>
4.6	<b>Compressor:</b> <ul style="list-style-type: none"> <li>• Sealed heavy duty type.</li> <li>• Starts and operates on electricity supply from 165 to 255 volts.</li> </ul>
4.7	<b>Control Panel:</b> The thermostat, thermometer and other visual displays like On/Off switch, power indicator must be positioned.
<b>5</b>	<b>Accessories, spares and consumables</b>
5.1	<b>Accessories:</b> <ul style="list-style-type: none"> <li>• Vaccine Storage baskets (wires type) or shelves- minimum 2per unit.</li> <li>• External Reading Thermometer (mercury free) - one piece per unit range of -50 to +50 °C.</li> <li>• Integrated Digital Temperature display LCD/LED-01 (for displaying temperature inside the system and shall operate either electrically or solar power).</li> </ul>
5.2	<b>Spare parts:</b> Shall be included complete sets of spare parts in every 10 units (compressor, indicator, lights, thermostats, relay, fan, capacitor, door gaskets, etc.)
<b>6</b>	<b>Operating Environment</b>
6.1	The product offered shall be designed to be stored and to operate normally under Nepal's Power Supply, Climate, Temperature (+5 °C to +45 °C), low and high Humidity conditions.
6.2	Unit Power supply: 220-240VAC, 50Hz fitted with appropriate plug. The power cable must be minimum 3 metres long. Power consumption: Preference will be given to less power consumption.

<b>S.N.</b>	<b>Purchaser's Specifications</b>
6.3	<b>Voltage Stabiliser:</b> Voltage stabiliser unit to fit the refrigerator shall be included. Stabilizer to have the capacity of 1KVA, normally operating input voltage of 110-270V.
<b>7</b>	<b>Standards and Safety Requirements</b>
7.1	Shall meet WHO Standard E3/RF.3.for Ice Lined Refrigerators or shall be WHO PQS certified product.
<b>8</b>	<b>User Training</b>
8.1	Must provide user training (including how to use and maintain the equipment).
<b>9</b>	<b>Warranty</b>
9.1	Comprehensive warranty for 2 years after acceptance.
<b>10</b>	<b>Maintenance Service During Warranty Period</b>
10.1	During the warranty period supplier must ensure corrective/breakdown maintenance whenever required.
<b>11</b>	<b>Installation and Commissioning</b>
11.1	The bidder must arrange for the equipment to be installed by certified or qualified personnel; any prerequisites for installation to be communicated to the purchaser in advance, in detail.
<b>12</b>	<b>Documentation</b>
12.1	User (Operating) manual in English.
12.2	Service (Technical / Maintenance) manual in English.
12.3	List of important spare parts and accessories with their part numbers and costing.
12.4	Certificate of calibration and inspection from factory.

## 2. Refrigerator and Freezer, Solar Powered with Batteries

S.N.	Purchaser's Specifications	
	<b>Refrigerator and Freezer, Solar Powered with Batteries</b>	
	<b>Manufacturer</b>	
	<b>Brand</b>	
	<b>Type / Model</b>	
	<b>Country of Origin</b>	
<b>1</b>	<b>Description of Function</b>	
1.1	This equipment is used primarily in areas without any electricity or where there is less than 2 hours of reliable electricity over a typical day.	
<b>2</b>	<b>Operational Requirements</b>	
2.1	The refrigerator and freezer, solar powered with batteries, will work during the day directly from the solar panel, while during nights operating from storage battery.	
<b>3</b>	<b>System Configuration</b>	
3.1	The system consists of : <ul style="list-style-type: none"> <li>• Solar PV Panels.</li> <li>• Components for mounting the PV system.</li> <li>• Earth Connection.</li> <li>• Battery &amp; Charge Regulators.</li> <li>• Combined Ice-lined Vaccine Refrigerator and Freezer.</li> </ul>	
<b>4</b>	<b>Technical Specifications</b>	
<b>I</b>	<b>Solar PV Panels</b>	
4.1	<b>Technology:</b> Based on Polycrystalline silicon solar cells.	
4.2	<b>Power Rating:</b> <ul style="list-style-type: none"> <li>• 400 to 450 Watt peak, 135 Wp each</li> </ul> Solar Array Peak Power, in combination with the supplied battery capacity, must be guaranteed to power the refrigerator and freezer reliably during the months of minimal solar radiation and the months of maximum temperature respectively.	
4.3	<b>Panel Surface:</b> Panels to be covered by anti-reflecting glass.	
4.4	<b>Panel frame:</b> Aluminium with stainless steel/bronze screws for fixing.	
<b>II</b>	<b>Components for mounting the PV system</b>	
4.5	<b>Panel Mounting Support Structure:</b> Metallic frame preferably slotted anodized aluminium or stainless steel or steel angles with stainless steel screws and self-locking washers for mounting the solar panel on the rooftop or ground. Frame must allow adjustment to incline the panels towards the sun's path during mounting. Array cables must be weather shielded in case of rooftop installations or of direct burial type, in case of ground installations.	
4.6	Array structures shall be designed to withstand loads of more than 200 Kg/m <sup>2</sup> and shall be supplied with fixings for either ground or roof mounting. Protection against the effect of lightning will be provided to protect the battery charge regulator and other components.	
4.7	<b>Electrical Mounting Accessories:</b> Electrical cables sufficient (16 to 20 meters long or as per requirements) to carry the panel currents to the system and battery without loss.	

S.N.	Purchaser's Specifications
	Additional cables for connecting the Charge regulator to system and battery.
4.8	<b>Earth Connection:</b> One complete earth connection kit.
4.9	<b>Quality Standard:</b> Must comply with WHO E3/ PV01.
<b>III</b>	<b>Battery &amp; Charge Regulators</b>
4.11	<b>Type of Battery:</b> Maintenance free Sealed type - Deep discharge, and shall have low self-discharge.
4.12	<b>Total Battery Capacity:</b> 12 V system having (6V X 420Ah X 2 batteries or 6V X 280Ah X 4 batteries).
4.13	<b>Autonomy on fully charged battery:</b> Minimum 5 days without sun (autonomous days) to run the unit under the prevailing temperature conditions.
4.14	<b>Battery set housing:</b> Plastic box with locking facility.
4.15	<b>Miscellaneous</b> Additional cables (minimum 15 metres), plugs, connectors, fuses and other materials for complete mounting of system. Battery safety kit equipment for protection of eye, hand, clothing etc. and data logger for electric current voltage.
4.16	<b>Charge regulator/ controller:</b> 12-24V, 30A with LCD display indicating SOC, battery volt, current in and current out etc. with built in data recording system storing data for minimum 3 months of downloadable data <b>The battery charge regulator must meet the WHO designed specifications and Bidders shall submit the documentary evidence of compliance</b>
<b>IV</b>	<b>Combined chest type Ice-lined Vaccine Refrigerator and Freezer:</b>
4.17	<b>Capacity:</b> <b>Refrigerator:</b> <ul style="list-style-type: none"> <li>• Gross: 110 to 120 litres.</li> <li>• Vaccine storage capacity: 60-80 litres net.</li> </ul> <b>Freezer:</b> <ul style="list-style-type: none"> <li>• Internal volume: 30 to 45 litres.</li> <li>• Ice pack storage capacity: around 50 pcs of 0.4 litres of icepack.</li> </ul>
4.18	<b>Temperature Control / Holdover Time:</b> Minimum 120 hours at 43°C. The refrigerator shall without energy and without being opened hold a temperature in the range of +2 °C to +10°C for a period as per WHO PQS requirements and preferably higher hours in a continuous external temperature of +43 °C. Bidder shall provide details of holdover time of their product.
4.19	<b>Material:</b> Preferably body structure shall be rotomolded or pure stainless steel body to prevent corrosion.
4.20	<b>Refrigerants:</b> The refrigerators& freezer shall utilize CFC (chlorofluorocarbon) free refrigerants
<b>5</b>	<b>Accessories, spares and consumables</b>
5.1	<b>Accessories:</b> <ul style="list-style-type: none"> <li>• Lock with key or combination lock on door.</li> <li>• External reading thermometer.</li> <li>• Vaccine storage baskets or shelves.</li> <li>• Icepack storage baskets or shelves.</li> </ul>
5.2	All standard accessories, consumables and parts required to operate the equipment, including all standard tools and cleaning and lubrication materials, to be included in the offer. Bidders must

<b>S.N.</b>	<b>Purchaser's Specifications</b>
	specify the quantity of every item included in their offer (including items not specified above).
<b>6</b>	<b>Operating Environment</b>
6.1	Must be suitable for hot zones, up to 43 °C.
<b>7</b>	<b>Standards and Safety Requirements</b>
7.1	Must have WHO/PQS certification.
7.2	The solar power products must comply with PQS performance specification :
7.3	WHO/PQS/E03/PV01.1: WHO Performance specification for solar power system for compression-cycle vaccine refrigerator or combined refrigerator-icepack freezer.
7.4	WHO/PQS/E03/PV01-VP1.1: WHO Type examination protocol for solar power system for compression-cycle vaccine refrigerator or combined refrigerator-icepack freezer.
7.5	WHO/PQS/PV01-VP2.1: WHO Quality Assurance protocol for solar power system for compression-cycle vaccine refrigerator or combined refrigerator-icepack freezer – onsite checklists for completed installations.
7.6	Associated refrigeration equipment must comply with the following specifications: WHO/PQS/RF04.1: Refrigerator or combined refrigerator-icepack freezer: compression-cycle. For solar powered rechargeable battery storage.
<b>8</b>	<b>User Training</b>
8.1	Must provide user training (including how to use and maintain the equipment).
<b>9</b>	<b>Warranty</b>
9.1	The minimum period of the comprehensive warranty shall be 10 years for the solar array, 5 years for the batteries and 2 years for the other components after acceptance.
<b>10</b>	<b>Maintenance Service During Warranty Period</b>
10.1	During the warranty period supplier must ensure preventive maintenance along with corrective/breakdown maintenance whenever required.
<b>11</b>	<b>Installation and Commissioning</b>
11.1	The bidder must arrange for the equipment to be installed and commissioned by certified or qualified personnel; any prerequisites for installation to be communicated to the purchaser in advance, in detail.
11.2	The bidder must install anti-theft mechanism for solar panels
<b>12</b>	<b>Documentation</b>
12.1	User (Operating) manual in English.
12.2	Service (Technical / Maintenance) manual in English.
12.3	List of important spare parts and accessories with their part numbers and costing.
12.4	Certificate of calibration and inspection from factory.

### 3. Refrigerator, Solar Powered without Batteries [Solar Direct Drive]

S.N.	Purchaser's Specifications	
	<b>Refrigerator and Freezer, Solar Powered with Batteries</b>	
	<b>Manufacturer</b>	
	<b>Brand</b>	
	<b>Type / Model</b>	
	<b>Country of Origin</b>	
<b>1</b>	<b>Description of Function</b>	
1.1	This equipment is used primarily in areas without any electricity or where there is less than 2 hours of reliable electricity over a typical day.	
<b>2</b>	<b>Operational Requirements</b>	
2.1	The refrigerator, solar powered without batteries, will work during the day directly from the solar panel, while during nights operating from ice bank.	
<b>3</b>	<b>System Configuration</b>	
3.1	The system consists of: <ul style="list-style-type: none"> <li>• Solar PV Panels.</li> <li>• Components for mounting the PV system.</li> <li>• Earth Connection.</li> <li>• Ice-lined Vaccine Refrigerator</li> </ul>	
<b>4</b>	<b>Technical Specifications</b>	
<b>I</b>	<b>Solar PV Panels</b>	
4.1	<b>Technology:</b> Based on Polycrystalline silicon solar cells.	
4.2	<b>Power Rating:</b> <ul style="list-style-type: none"> <li>• 400 to 450 Watt peak, 135 Wp each</li> </ul> Solar Array Peak Power, in combination with the supplied battery capacity, must be guaranteed to power the refrigerator and freezer reliably during the months of minimal solar radiation and the months of maximum temperature respectively.	
4.3	<b>Panel Surface:</b> Panels to be covered by anti-reflecting glass.	
4.4	<b>Panel frame:</b> Aluminium with stainless steel/bronze screws for fixing.	
<b>II</b>	<b>Components for mounting the PV system</b>	
4.5	<b>Panel Mounting Support Structure:</b> Metallic frame preferably slotted anodized aluminium or stainless steel or steel angles with stainless steel screws and self-locking washers for mounting the solar panel on the rooftop or ground. Frame must allow adjustment to incline the panels towards the sun's path during mounting. Array cables must be weather shielded in case of rooftop installations or of direct burial type, in case of ground installations.	
4.6	Array structures shall be designed to withstand loads of more than 200 Kg/m <sup>2</sup> and shall be supplied with fixings for either ground or roof mounting. Protection against the effect of lightning will be provided to protect the battery charge regulator and other components.	
4.7	<b>Electrical Mounting Accessories:</b> Electrical cables sufficient (16 to 20 meters long or as per requirements) to carry the panel currents to the system and battery without loss.	
4.8	<b>Earth Connection:</b> One complete earth connection kit.	

<b>S.N.</b>	<b>Purchaser's Specifications</b>
4.9	<b>Quality Standard:</b> Must comply with WHO/PQS/E003/RF05.3
<b>III</b>	<b>Battery &amp; Charge Regulators</b>
4.13	<b>Autonomy on fully charged ice bank:</b> Minimum 3 days without sun (autonomous days) to run the unit under the prevailing temperature conditions.
4.15	<b>Miscellaneous</b> Additional cables (minimum 15 metres), plugs, connectors, fuses and other materials for complete mounting of system.
<b>IV</b>	<b>Ice-lined Vaccine Refrigerator:</b>
4.17	<b>Capacity:</b> <b>Refrigerator:</b> <ul style="list-style-type: none"> <li>• Gross: 110 to 120 litres.</li> <li>• Vaccine storage capacity: 60-80 litres net.</li> </ul>
4.18	<b>Temperature Control / Holdover Time:</b> Minimum 20 hours at 43°C. The refrigerator shall without energy and without being opened hold a temperature in the range of +2 °C to +10°C for a period as per WHO PQS requirements and preferably higher hours in a continuous external temperature of +43 °C. Bidder shall provide details of holdover time of their product.
4.19	<b>Material:</b> Preferably body structure shall be rotomolded or pure stainless steel body to prevent corrosion.
4.20	<b>Refrigerants:</b> The refrigerators& freezer shall utilize CFC (chlorofluorocarbon) free refrigerants
<b>5</b>	<b>Accessories, spares and consumables</b>
5.1	<b>Accessories:</b> <ul style="list-style-type: none"> <li>• Lock with key or combination lock on door.</li> <li>• External reading thermometer.</li> <li>• Vaccine storage baskets or shelves.</li> </ul>
5.2	All standard accessories, consumables and parts required to operate the equipment, including all standard tools and cleaning and lubrication materials, to be included in the offer. Bidders must specify the quantity of every item included in their offer (including items not specified above).
<b>6</b>	<b>Operating Environment</b>
6.1	Must be suitable for hot zones, up to 43 °C.
<b>7</b>	<b>Standards and Safety Requirements</b>
7.1	Must have WHO/ PQS certification.
7.2	The solar power products must comply with PQS performance specification :
7.3	WHO/PQS/E003/PV01.2: Solar power system for compression-cycle vaccine refrigerator or combined refrigerator and water-pack freezer.
<b>8</b>	<b>User Training</b>
8.1	Must provide user training (including how to use and maintain the equipment).
<b>9</b>	<b>Warranty</b>
9.1	The minimum period of the comprehensive warranty shall be 10 years for the solar array and 2 years for the other components after acceptance.
<b>10</b>	<b>Maintenance Service During Warranty Period</b>
10.1	During the warranty period supplier must ensure preventive maintenance along with corrective/breakdown maintenance whenever required.

<b>S.N.</b>	<b>Purchaser's Specifications</b>
<b>11</b>	<b>Installation and Commissioning</b>
11.1	The bidder must arrange for the equipment to be installed and commissioned by certified or qualified personnel; any prerequisites for installation to be communicated to the purchaser in advance, in detail.
11.2	The bidder must install anti-theft mechanism for solar panels
<b>12</b>	<b>Documentation</b>
12.1	User (Operating) manual in English.
12.2	Service (Technical / Maintenance) manual in English.
12.3	List of important spare parts and accessories with their part numbers and costing.
12.4	Certificate of calibration and inspection from factory.



## 4. Ice Pack Freezers

S.N.	Purchaser's Specifications	
	<b>Ice pack freezers</b>	
	<b>Manufacturer</b>	
	<b>Brand</b>	
	<b>Type / Model</b>	
	<b>Country of Origin</b>	
<b>1</b>	<b>Description of Function</b>	
1.1	Icepack freezers have the highest rate of freezing, because of a special design. Icepack freezers are recommended wherever large quantities of icepacks are repeatedly needed in short time intervals.	
<b>2</b>	<b>Operational Requirements</b>	
2.1	Large volume of icepacks freezing for very short period of time is required.	
<b>3</b>	<b>System Configuration</b>	
3.1	Icepack Freezer Upright with voltage stabiliser (As specified in 6.3).	
<b>4</b>	<b>Technical Specifications</b>	
4.1	It shall be upright, single door standing ice pack freezer.	
4.2	Frozen icepack storage capacity: 275-300 litres, has a net capacity to store 300 pieces of icepacks.	
4.3	<b>Construction:</b> <ul style="list-style-type: none"> <li>• Corrosion resistance: Internal and external cabinet, lid and frame protected against corrosion. Bidder to specify the materials used for construction of internal &amp; external cabinet.</li> <li>• Basket/shelves/ trays: Bidder to specify the number of basket/shelves/trays will be supplied with the unit.</li> <li>• Door with lock and handle.</li> <li>• Silicon gasket.</li> </ul>	
4.4	<b>Refrigerant:</b> The refrigerator shall utilize CFC (Chlorofluorocarbon) free refrigerants,	
4.5	<b>Temperature control:</b> Temperature range must be -15 °C to -25 °C	
4.6	<b>Compressor:</b> <ul style="list-style-type: none"> <li>• Sealed heavy duty type.</li> <li>• Starts and operates on electricity supply from 165 to 255 volts.</li> </ul>	
4.7	<b>Control Panel:</b> The thermostat, thermometer and other visual displays like On/Off switch, power indicator must be positioned.	
4.8	Packing: Labels bearing handling instructions and delivery address shall be highly visible and printed clearly on the outer packing.	
<b>5</b>	<b>Accessories, spares and consumables</b>	
5.1	<b>Accessories:</b> <ul style="list-style-type: none"> <li>• External Reading Thermometer (mercury free) –one piece per unit range of -50 to +50 °C.</li> <li>• Integrated Digital Temperature display LCD/LED-01 (for displaying temperature inside the system and shall operate either electrically or solar power).</li> </ul>	
5.2	<b>Spare parts:</b> Shall be included complete sets of spare parts in every 10 units (compressor, indicator, lights, thermostats, relay, fan, capacitor, door gaskets, etc.)	
<b>6</b>	<b>Operating Environment</b>	
6.1	The product offered shall be designed to be stored and to operate normally under Nepal's Power Supply, Climate, Temperature (+5 °C to +45 °C), low and high Humidity conditions.	

<b>S.N.</b>	<b>Purchaser's Specifications</b>
6.2	Unit Power supply: 220-240VAC, 50Hz fitted with appropriate plug. The power cable must be minimum 3 metres long. Power consumption: Preference will be given to less power consumption.
6.3	<b>Voltage Stabiliser:</b> Voltage stabiliser unit to fit the refrigerator shall be included. Stabilizer to have the capacity of 1KVA, normally operating input voltage of 110-270V.
<b>7</b>	<b>Standards and Safety Requirements</b>
7.1	Shall comply with appropriate WHO Standard E3/FR/FZ or shall be WHO PQS certified product.
<b>8</b>	<b>User Training</b>
8.1	Must provide user training (including how to use and maintain the equipment).
<b>9</b>	<b>Warranty</b>
9.1	Comprehensive warranty for 2 years, after acceptance.
<b>10</b>	<b>Maintenance Service During Warranty Period</b>
10.1	During the warranty period supplier must ensure corrective/breakdown maintenance whenever required.
<b>11</b>	<b>Installation and Commissioning</b>
11.1	The bidder must arrange for the equipment to be installed by certified or qualified personnel; any prerequisites for installation to be communicated to the purchaser in advance, in detail.
<b>12</b>	<b>Documentation</b>
12.1	User (Operating) manual in English.
12.2	Service (Technical / Maintenance) manual in English.
12.3	List of important spare parts and accessories with their part numbers and costing.
12.4	Certificate of calibration and inspection from factory.

## 5. Chest Freezer

### 5.1 Freezer, Chest

S.N.	Purchaser's Specifications
	<b>Freezer, Chest</b>
	<b>Manufacturer</b>
	<b>Brand</b>
	<b>Type / Model</b>
	<b>Country of Origin</b>
<b>1</b>	<b>Description of Function</b>
1.1	Icepack freezers have the highest rate of freezing, because of a special design. Icepack freezers are recommended wherever large quantities of icepacks are repeatedly needed in short time intervals.
<b>2</b>	<b>Operational Requirements</b>
2.1	To store icepacks.
<b>3</b>	<b>System Configuration</b>
3.1	Chest Freezer with voltage stabiliser (As specified in 6.3).
<b>4</b>	<b>Technical Specifications</b>
4.1	Frozen ice pack capacity: Minimum 240 litres and has a capacity to store (250-300) pieces of ice packs.
4.2	<b>Construction:</b> <ul style="list-style-type: none"> <li>• Corrosion resistance: Internal and external cabinet, lid and frame protected against corrosion. Bidder to specify the materials used for construction of internal &amp; external cabinet.</li> <li>• Chest type CFC – free insulation</li> <li>• Basket/ trays/shelves</li> <li>• Door with lock and handle</li> </ul>
4.3	<b>Refrigerant:</b> CFC free Refrigerant
4.4	<b>Compressor:</b> <ul style="list-style-type: none"> <li>• Sealed heavy duty type.</li> <li>• Starts and operates on electricity supply from 165 to 255 volts.</li> </ul>
4.5	An alarm shall be installed to warn that power to the compressor has been disconnected.
<b>5</b>	<b>Accessories, spares and consumables</b>
5.1	<b>Accessories:</b> <ul style="list-style-type: none"> <li>• External Reading Thermometer (mercury free) - one piece per unit range of -50 to +50 °C.</li> <li>• Integrated Digital Temperature display LCD/LED-01 (for displaying temperature inside the system and shall operate either electrically or solar power).</li> <li>• Foam Pad for insulating top from freezer cover.</li> </ul>
5.2	<b>Spare parts:</b> Shall be included one complete set of spare parts in every 5 units (Compressor, indicator lights, electrical/electronic thermostats, relay, fan and capacitor, door gaskets etc.)
<b>6</b>	<b>Operating Environment</b>
6.1	The product offered shall be designed to be stored and to operate normally under Nepal's Power Supply, Climate, Temperature (+5 °C to +45 °C), low and high Humidity conditions.
6.2	Unit Power supply: 220-240VAC, 50Hz fitted with appropriate plug. The power cable must be minimum 3 metres long. Power consumption: Preference will be given to less power consumption.
6.3	<b>Voltage Stabiliser:</b>

<b>S.N.</b>	<b>Purchaser's Specifications</b>
	Voltage stabiliser unit to fit the refrigerator should be included. Stabilizer to have the capacity of 1KVA, normally operating input voltage of 110-270V.
<b>7</b>	<b>Standards and Safety Requirements</b>
7.1	Shall comply with appropriate WHO Standard E3/FR/FZ.1 or shall be WHO PQS certified product.
<b>8</b>	<b>User Training</b>
8.1	Must provide user training (including how to use and maintain the equipment).
<b>9</b>	<b>Warranty</b>
9.1	Comprehensive warranty for 2 years after acceptance.
<b>10</b>	<b>Maintenance Service During Warranty Period</b>
10.1	During the warranty period supplier must ensure corrective/breakdown maintenance whenever required.
<b>11</b>	<b>Installation and Commissioning</b>
11.1	The bidder must arrange for the equipment to be installed by certified or qualified personnel; any prerequisites for installation to be communicated to the purchaser in advance, in detail.
<b>12</b>	<b>Documentation</b>
12.1	User (Operating) manual in English.
12.2	Service (Technical / Maintenance) manual in English.
12.3	List of important spare parts and accessories with their part numbers and costing.
12.4	Certificate of calibration and inspection from factory.

## 5.2 Freezer, Chest

S.N.	Purchaser's Specifications
	<b>Freezer, Chest</b>
	<b>Manufacturer</b>
	<b>Brand</b>
	<b>Type / Model</b>
	<b>Country of Origin</b>
<b>1</b>	<b>Description of Function</b>
1.1	Icepack freezers have the highest rate of freezing, because of a special design. Icepack freezers are recommended wherever large quantities of icepacks are repeatedly needed in short time intervals.
<b>2</b>	<b>Operational Requirements</b>
2.1	To store icepacks.
<b>3</b>	<b>System Configuration</b>
3.1	Chest Freezer with voltage stabiliser (As specified in 6.3)
<b>4</b>	<b>Technical Specifications</b>
4.1	Frozen ice pack capacity: Minimum 160 litres
4.2	<p><b>Construction:</b></p> <ul style="list-style-type: none"> <li>• Corrosion resistance: Internal and external cabinet, lid and frame protected against corrosion. Bidder to specify the materials used for construction of internal &amp; external cabinet.</li> <li>• CFC free insulation</li> <li>• Basket/ trays/shelves</li> <li>• Door with lock and handle</li> </ul>
4.3	<p><b>Refrigerant:</b> CFC free Refrigerant and insulation.</p>
4.4	<p><b>Holdover time:</b> Temperature range must be -15 to -25 °C, Without opening the freezer shall maintain -4 °C for 14 hours during power cut at the ambient temperature of 43 °C. <b>Preference will be given to longer holdover time.</b></p>
4.5	<p><b>Compressor:</b></p> <ul style="list-style-type: none"> <li>• Sealed heavy duty type.</li> <li>• Starts and operates on electricity supply from 165 to 255 volts.</li> </ul>
4.6	An alarm (red LED), or similar, shall be installed to warn that power to the compressor has been disconnected.
<b>5</b>	<b>Accessories, spares and consumables</b>
5.1	<p><b>Accessories:</b></p> <ul style="list-style-type: none"> <li>• External Reading Thermometer (mercury free) –one piece per unit range of -50 to +50 °C.</li> <li>• Integrated Digital Temperature display LCD/LED-01 (for displaying temperature inside the system and shall operate either electrically or solar power).</li> <li>• Foam Pad for insulating top from freezer cover.</li> </ul>
5.2	<p><b>Spare parts:</b> Shall be included one complete set of spare parts in every 10 units (Compressor, indicator lights, electrical/electronic thermostats, relay, fan and capacitor, door gaskets etc.)</p>
<b>6</b>	<b>Operating Environment</b>
6.1	The product offered shall be designed to be stored and to operate normally under Nepal's Power Supply, Climate, Temperature (+5 °C to +45 °C), low and high Humidity conditions.
6.2	Unit Power supply: 220-240VAC, 50Hz fitted with appropriate plug. The power cable must be minimum 3 metres long.

<b>S.N.</b>	<b>Purchaser's Specifications</b>
	Power consumption: Preference will be given to less power consumption
6.3	<b>Voltage Stabiliser:</b> Voltage stabiliser unit to fit the refrigerator shall be included. Stabilizer to have the capacity of 1KVA, normally operating input voltage of 110-270V.
<b>7</b>	<b>Standards and Safety Requirements</b>
7.1	Shall comply with appropriate WHO Standard E3/FR/FZ.1 or shall be WHO PQS certified product.
<b>8</b>	<b>User Training</b>
8.1	Must provide user training (including how to use and maintain the equipment).
<b>9</b>	<b>Warranty</b>
9.1	Comprehensive warranty for 2 years after acceptance.
<b>10</b>	<b>Maintenance Service During Warranty Period</b>
10.1	During the warranty period supplier must ensure corrective/breakdown maintenance whenever required.
<b>11</b>	<b>Installation and Commissioning</b>
11.1	The bidder must arrange for the equipment to be installed by certified or qualified personnel; any prerequisites for installation to be communicated to the purchaser in advance, in detail.
<b>12</b>	<b>Documentation</b>
12.1	User (Operating) manual in English.
12.2	Service (Technical / Maintenance) manual in English.
12.3	List of important spare parts and accessories with their part numbers and costing.
12.4	Certificate of calibration and inspection from factory.

## 6. Refrigeration Unit for Walk In Cooler

### 6.1 Cold Room, Walk-in Type (Up to 10m<sup>3</sup> Gross Volume - Single phase)

S.N.	Purchaser's Specifications
	<b>Cold Room, Walk-in Type</b>
	<b>Manufacturer</b>
	<b>Brand</b>
	<b>Type/Model</b>
	<b>Country of Origin</b>
<b>1</b>	<b>Description of Function</b>
1.1	Cold room, walk-in type, for storage of vaccines.
<b>2</b>	<b>Operational Requirements</b>
2.1	Prefabricated/prefab cold room, walk-in type, supplied with all necessary mechanical and electrical fittings and equipment for quick and easy installation in the field.
2.2	Meets WHO standard E01/CR-FR01.2.
<b>3</b>	<b>System Configuration</b>
3.1	The system consists of: <ul style="list-style-type: none"> <li>• Cold room, walk-in type</li> <li>• Dual Refrigeration system</li> <li>• DG set</li> <li>• Voltage stabilizer</li> </ul>
<b>4</b>	<b>Technical Specifications</b>
4.1	The complete unit is also designed for installation in a warehouse in order to meet temperature design standards.
4.2	Operating temperature of the cold-room is +4°C which is maintained even in environments where the ambient temperature may be as high as +43°C.
4.3	Prefabricated, modular walk-in cold room, complete with floor, wall, and ceiling panels.
4.4	Internal temperature +4°C which is not adjustable without access code Insulation material is CFC-free polyurethane, foamed-in-place, density min. 40 kg/m <sup>3</sup> .
4.5	Insulation thickness is minimum 100 mm
4.6	Internal and external surfaces of hot-dipped galvanized steel sheet, white polyester coating, and floor clad with non-slip material.
4.7	Door is approximately 700-800 mm wide, 2000 mm high.
4.8	Room is equipped with lighting both outside and inside with external switch and pilot lamp.
4.9	Rooms are equipped with shelving system on three walls, material is galvanized steel, with 5 levels, minimum 530 mm deep, adjustable.
4.10	Automatic data logger with battery backup.
4.11	Data logging even when the power is off.
4.12	Windows software that allow current temperatures to be displayed on screen.
4.13	Temperature data is automatically logged, downloaded and stored.
4.14	Tables and graphs can be viewed on screen or printed on demand.
4.15	Current temperatures for all locations can be viewed on screen at any time.
4.16	Built-in alarm - audible; individual high/low limits and alarm delays can be set for each sensor. The sensors can be configured as digital sensors, i.e. Open/Shut, On/Off for example, to indicate whether doors are open or closed at the time temperatures were recorded.
4.17	The monitor can be wall mounted.
4.18	External dial type thermometer with remote sensor on front panel.
4.19	Room equipped with dual refrigeration system (100% stand by).
4.20	Air-cooled refrigeration units, complete plug-in/split type and factory tested. When split type is required, 20m of copper tubing and necessary fittings must be included.

<b>S.N.</b>	<b>Purchaser's Specifications</b>
4.21	Only electrical connection to be made at site.
4.22	Automatic defrosting. Plastic strip curtain in doorway. Door equipped with heavy duty hinges and lock with internal safety release. Suitable for operation at ambient temperatures of up to +43°C.
4.23	Room equipped with individual alarm systems with sound and light signals. CFC-free refrigerant
4.24	<b>DG set:</b> Suitable standby generator set, diesel operated, 220-240V/ 50 Hz AC Single phase. The diesel tank capacity must allow for a minimum of 8 hours continuous running. Generator must have sound proof canopy. Complete installation including earthing and civil works and fitting to be done such that the smoke must be emitted outside the generator. Generator must be complete with AMF (Automatic Mains Failure) panel and battery.
4.25	<b>Voltage stabilizer:</b> KVA Rating: <ul style="list-style-type: none"> <li>• For single phase: Input Voltage 160-260 V AC 50 Hz and output 220-240 V AC 50 Hz.</li> </ul> Common Specs: 3-4 sec cut off and 2 minutes restart delay. Facilities for manual control of output. Arrangements for direct supply bypassing the stabilizer in case of failures, voltmeter and indicators on front panel, suitable safety and protection devices. Quick start arrangement for bypassing restart delay.
<b>5</b>	<b>Accessories, spares and consumables</b>
5.1	All standard accessories, consumables and parts required to operate the equipment, including all standard tools and cleaning and lubrication materials, to be included in the offer. Bidders must specify the quantity of every item included in their offer (including items not specified above).
<b>6</b>	<b>Operating Environment</b>
6.1	The product offered shall be designed to be stored and to operate normally under Nepal's Power Supply, Climate, Temperature (+5 °C to +45 °C), low and high Humidity conditions.
6.2	Unit Power supply: 220-240V/ 50 Hz AC Single phase fitted with appropriate plugs and sockets.
<b>7</b>	<b>Standards and Safety Requirements</b>
7.1	Shall comply with appropriate WHO standard E01/CR-FR01.2. or shall be WHO PQS certified product.
7.2	Electrical and refrigeration components and the panels must have international approvals like UL, TUV, CE, NSF or equivalent.
<b>8</b>	<b>User Training</b>
8.1	Must provide user training (including how to use and maintain the equipment).
<b>9</b>	<b>Warranty</b>
9.1	Comprehensive warranty for 2 years after acceptance.
<b>10</b>	<b>Maintenance Service During Warranty Period</b>
10.1	During the warranty period supplier must ensure preventive maintenance and corrective/breakdown maintenance whenever required.
<b>11</b>	<b>Installation and Commissioning</b>
11.1	The bidder must arrange for the equipment to be installed and commissioned by certified or qualified personnel; any prerequisites for installation to be communicated to the purchaser in advance, in detail.



<b>12</b>	<b>Documentation</b>
12.1	User (Operating) manual in English
12.2	Service (Technical / Maintenance) manual in English
12.3	List of important spare parts and accessories with their part numbers and costing.
12.4	Certificate of inspection from an independent laboratory approved/recognized by WHO/UNICEF/or internationally reputed lab.

## 6.2 Cold Room, Walk-in Type (Up to 10m<sup>3</sup> Gross Volume - Three Phase)

S.N.	Purchaser's Specifications
	<b>Cold Room, Walk-in Type</b>
	<b>Manufacturer</b>
	<b>Brand</b>
	<b>Type/Model</b>
	<b>Country of Origin</b>
<b>1</b>	<b>Description of Function</b>
1.1	Cold room, walk-in type, for storage of vaccines.
<b>2</b>	<b>Operational Requirements</b>
2.1	Prefabricated/prefab cold room, walk-in type, supplied with all necessary mechanical and electrical fittings and equipment for quick and easy installation in the field.
2.2	Meets WHO standard E01/CR-FR01.2.
<b>3</b>	<b>System Configuration</b>
3.1	The system consists of: <ul style="list-style-type: none"> <li>• Cold room, walk-in type</li> <li>• Dual Refrigeration system</li> <li>• DG set</li> <li>• Voltage stabilizer</li> </ul>
<b>4</b>	<b>Technical Specifications</b>
4.1	The complete unit is also designed for installation in a warehouse in order to meet temperature design standards.
4.2	Operating temperature of the cold-room is +4°C which is maintained even in environments where the ambient temperature may be as high as +43°C.
4.3	Prefabricated, modular walk-in cold room, complete with floor, wall, and ceiling panels.
4.4	Internal temperature +4°C which is not adjustable without access code Insulation material is CFC-free polyurethane, foamed-in-place, density min. 40 kg/m <sup>3</sup> .
4.5	Insulation thickness is minimum 100 mm
4.6	Internal and external surfaces of hot-dipped galvanized steel sheet, white polyester coating, and floor clad with non-slip material.
4.7	Door is approximately 700-800 mm wide, 2000 mm high.
4.8	Room is equipped with lighting both outside and inside with external switch and pilot lamp.
4.9	Rooms are equipped with shelving system on three walls, material is galvanized steel, with 5 levels, minimum 530 mm deep, adjustable.
4.10	Automatic data logger with battery backup.
4.11	Data logging even when the power is off.
4.12	Windows software that allow current temperatures to be displayed on screen.
4.13	Temperature data is automatically logged, downloaded and stored.
4.14	Tables and graphs can be viewed on screen or printed on demand.
4.15	Current temperatures for all locations can be viewed on screen at any time.
4.16	Built-in alarm - audible; individual high/low limits and alarm delays can be set for each sensor. The sensors can be configured as digital sensors, i.e. Open/Shut, On/Off for example, to indicate whether doors are open or closed at the time temperatures were recorded.
4.17	The monitor can be wall mounted.
4.18	External dial type thermometer with remote sensor on front panel.
4.19	Room equipped with dual refrigeration system (100% stand by).
4.20	Air-cooled refrigeration units, complete plug-in/split type and factory tested. When split type is required, 20m of copper tubing and necessary fittings must be included.
4.21	Only electrical connection to be made at site.
4.22	Automatic defrosting.

S.N.	Purchaser's Specifications
	Plastic strip curtain in doorway. Door equipped with heavy duty hinges and lock with internal safety release. Suitable for operation at ambient temperatures of up to +43°C.
4.23	Room equipped with individual alarm systems with sound and light signals. CFC-free refrigerant
4.24	<b>DG set:</b> Suitable standby generator set, diesel operated, 380-400V AC 50 Hz Three phase depending upon voltage requirement of the cold room. The diesel tank capacity must allow for a minimum of 8 hours continuous running. Generator must have sound proof canopy. Complete installation including earthing and civil works and fitting to be done such that the smoke must be emitted outside the generator. Generator must be complete with AMF (Automatic Mains Failure) panel and battery.
4.25	<b>Voltage stabilizer:</b> KVA Rating: <ul style="list-style-type: none"> <li>• For three phase: Input Voltage 275-440 V 50 Hz; Output: 400 V +/- 1%, 50 Hz. Three phase four wires.</li> </ul> Common Specs: 3-4 sec cut off and 2 minutes restart delay. Facilities for manual control of output. Arrangements for direct supply bypassing the stabilizer in case of failures, voltmeter and indicators on front panel, suitable safety and protection devices. Quick start arrangement for bypassing restart delay.
<b>5</b>	<b>Accessories, spares and consumables</b>
5.1	All standard accessories, consumables and parts required to operate the equipment, including all standard tools and cleaning and lubrication materials, to be included in the offer. Bidders must specify the quantity of every item included in their offer (including items not specified above).
<b>6</b>	<b>Operating Environment</b>
6.1	The product offered shall be designed to be stored and to operate normally under Nepal's Power Supply, Climate, Temperature (+5 °C to +45 °C), low and high Humidity conditions.
6.2	Unit Power supply: 380-400V AC 50 Hz Three phase fitted with appropriate plugs and sockets.
<b>7</b>	<b>Standards and Safety Requirements</b>
7.1	Shall comply with appropriate WHO standard E01/CR-FR01.2. or shall be WHO PQS certified product.
7.2	Electrical and refrigeration components and the panels must have international approvals like UL, TUV, CE, NSF or equivalent.
<b>8</b>	<b>User Training</b>
8.1	Must provide user training (including how to use and maintain the equipment).
<b>9</b>	<b>Warranty</b>
9.1	Comprehensive warranty for 2 years after acceptance.
<b>10</b>	<b>Maintenance Service During Warranty Period</b>
10.1	During the warranty period supplier must ensure preventive maintenance and corrective/breakdown maintenance whenever required.
<b>11</b>	<b>Installation and Commissioning</b>
11.1	The bidder must arrange for the equipment to be installed and commissioned by certified or qualified personnel; any prerequisites for installation to be communicated to the purchaser in advance, in detail.

<b>12</b>	<b>Documentation</b>
12.1	User (Operating) manual in English
12.2	Service (Technical / Maintenance) manual in English
12.3	List of important spare parts and accessories with their part numbers and costing.
12.4	Certificate of inspection from an independent laboratory approved/recognized by WHO/UNICEF/or internationally reputed lab.

### 6.3 Cold room, Walk In Type [Above 10m<sup>3</sup> Gross Volume]

S.N.	Purchaser's Specifications
	<b>Cold room, Walk In Type</b>
	<b>Manufacturer</b>
	<b>Brand</b>
	<b>Type/Model</b>
	<b>Country of Origin</b>
<b>1</b>	<b>Description of Function</b>
1.1	Pre-fabricated Cold Room (Walk in Cooler) is required to store vaccines at a temperature between +2 °C to +8 °C.
<b>2</b>	<b>Operational Requirements</b>
2.1	To be of prefabricated, modular construction complete with floor and ceiling panels, mounted on a flat, solid concrete base. The vaccine cold store must provide total, 24-hour, all-season reliability under all conditions for the stored materials.
2.2	All refrigeration machinery must be provided with 100% standby capacity, with duplicate, independent controls, pipe work, instrumentation and machinery, to provide against failure of the primary system. Automatic changeover and starting of the secondary system is to be provided, activated by thermostatic or electrical control.
2.3	Internal Temperature: +2 °C to +8 °C adjustable (i)during +43 °C continuous ambient(ii) 32 °C continuous ambient (iii) 45/0°C day/night cycling temperatures.
<b>3</b>	<b>System Configuration</b>
3.1	The system consists of: <ul style="list-style-type: none"> <li>• Cold room with CFC free PUF insulation</li> <li>• Dual Refrigeration system</li> <li>• DG set</li> <li>• Voltage stabilizer</li> </ul>
<b>4</b>	<b>Holdover Time</b>
4.1	Minimum 8 hours of holdover time below +10C of ambient temperature of +45C. Preference will be given to longer holdover time.
<b>5</b>	<b>Technical Specifications</b>
5.1	Dimension: Internal Volume above 10m <sup>3</sup> (According to the tender requirement)
5.2	Construction: Outer and internal: Plastic coated galvanized steel panels, non-corrosive metallic panels or fiber glass panels.
5.3	Density of panels: 40 Kg (±2Kg). /m <sup>3</sup>
5.4	Floor: 100 mm thick PUF Panel with 12 mm thick plywood finished with 4 mm thick Aluminium checker sheet on top.
5.5	Insulation: CFC-Free Polyurethane foam having minimum thickness of 100 mm. The insulation must be suitable for maintaining 8 hrs hold over time at 45 °C ambient temperature.
5.6	Door: Hinged Door, swing type having heavy duty lock with internal safety release, shelving system and plastic curtains on the door way. Door to cold rooms to be lockable with 100% fail-safe provision for opening from inside. Entrance door shall have an incandescent vapour-proof light mounted on the interior of the door section. The door dimensions will be approximately 36" to 40" (W) x72" to 80" (H). Internal ceiling-mounted tungsten filament lighting with an external switch and pilot light must be provided. The external light and light switch must be fixed to the wall of the cold room enclosure near to the entrance door. The lighting must be evenly

S.N.	Purchaser's Specifications
	distributed inside the cold room.
5.7	Dual Refrigeration system (100% standby) air cooled refrigeration units, plug in type, automatic defrosting (electric or hot gas) CFC free refrigerant. Tropicalized units suitable for ambient temperature up to 45 °C. Compressor run time is 18 hrs. Pull down time 24 hrs.
5.8	Compressor Type: Hermetic, Reciprocating
5.9	Suitable standby generator set, diesel operated, 380-400V AC 50 Hz Three phase. The diesel tank capacity must allow for a minimum of 8 hours continuous running. Generator must have sound proof canopy. Complete installation including earthing and civil works and fitting to be done such that the smoke must be emitted outside the generator.
5.10	Generator must be complete with AMF (Automatic Mains Failure) panel and battery.
5.11	<b>Digital Thermometer:</b> Wall mounted seven days digital thermometer of 4 digits LCD/LED Display with data logging capability of 7 days with suitable printer for report generation with remote sensor.
5.12	<b>Dial thermometer (Standard):</b> A vapour or gas pressure dial thermometer for ease and quick reference of temperature to be mounted on the front face of the cold room in line with PQS E06/TH02 performance specifications.
5.13	High and Low temperature alarm unit.
5.14	Condensing unit to comprise compressor, forced air condenser, oil separator, liquid receiver to carry full charge, filter/dryer with flare connections, service and isolating stop valves, high and low pressure dial gauges and oil level sight glass.
5.15	Storage conditions to be maintained at +4°C ±2 °C continuously control by thermostat, condensing unit fitted with high and low pressure cut-outs, time-operated electric defrost control and compressor motor overloads.
5.16	Cold room to be fitted with manufactured, running adjustable (slatted shelves will be preferred) two shelves on all four walls suitably placed inside the cold room, and there must be space for the movement of men and material. The material of the shelves must be non-corrosive medical grade stainless steel to take load of at least 20 kg/sq. foot. Shelving must be washable.
5.17	Evaporators to be forced-draught, electric-defrost, ceiling-mounted units with fitted condensate drip tray and drain connection.
5.18	The room must be fitted with a pressure release vent which must open and allows enough outside air to enter and rebalance any pressure difference.
5.19	<p><b>Servo Voltage stabilizer broad specifications:</b></p> <p>KVA Rating:</p> <ul style="list-style-type: none"> <li>• For three phase: Input Voltage 275-440 V 50 Hz; Output: 400 V +/- 1%, 50 Hz. Three phase four wires.</li> </ul> <p>Common Specs:</p> <p>Facilities for manual control of output. Arrangements for direct supply bypassing the stabilizer in case of failures, voltmeter and indicators on front panel, suitable safety and protection devices.</p>
<b>6</b>	<b>Accessories, spares and consumables</b>
6.1	All standard accessories, consumables and parts required to operate the equipment, including all standard tools and cleaning and lubrication materials, to be included in the offer. Bidders must specify the quantity of every item included in their offer (including items not specified above).
<b>7</b>	<b>Operating Environment</b>
7.1	The unit shall be capable of operating continuously in ambient temperature of +5C to +45 °C and relative humidity of 15-90%.
7.2	Unit Power supply: 380-400V AC 50 Hz Three phase as appropriate fitted with appropriate plugs and sockets.
<b>8</b>	<b>Standards and Safety Requirements</b>
8.1	Shall comply with appropriate WHO standard E01/CR-FR01.2.or shall be WHO PQS certified

<b>S.N.</b>	<b>Purchaser's Specifications</b>
	product.
8.2	Electrical and refrigeration components and the panels must have international approvals like UL, TUV, CE, NSF or equivalent.
<b>9</b>	<b>User Training</b>
9.1	Must provide user training (including how to use and maintain the equipment).
<b>10</b>	<b>Warranty</b>
10.1	Comprehensive warranty for 2 years after acceptance.
<b>11</b>	<b>Maintenance Service During Warranty Period</b>
11.1	During the warranty period supplier must ensure preventive maintenance and corrective/breakdown maintenance whenever required.
<b>12</b>	<b>Installation and Commissioning</b>
12.1	The bidder must arrange for the equipment to be installed and commissioned by certified or qualified personnel; any prerequisites for installation to be communicated to the purchaser in advance, in detail.
<b>13</b>	<b>Documentation</b>
13.1	User (Operating) manual in English
13.2	Service (Technical / Maintenance) manual in English
13.3	List of important spare parts and accessories with their part numbers and costing.
13.4	Certificate of inspection from an independent laboratory approved/recognized by WHO/UNICEF/or internationally reputed lab.

## 7. Refrigeration Unit for Walk In Freezer

### 7.1 Walk-in Freezer [Above 10m<sup>3</sup>]

S.N.	Purchaser's Specifications
	<b>Walk-in Freezer</b>
	<b>Manufacturer</b>
	<b>Brand</b>
	<b>Type/Model</b>
	<b>Country of Origin</b>
<b>1</b>	<b>Description of Function</b>
1.1	Walk in Freezer is required for storing Vaccines and other items at -20°C.
<b>2</b>	<b>Operational Requirements</b>
2.1	Freezer room, walk-in type, for storage of vaccines.
2.2	Prefabricated / prefab freezer room, walk-in type, supplied with all necessary mechanical and electrical fittings and equipment for quick and easy installation in the field.
2.3	Meets WHO standard E01/CR-FR01.2
<b>3</b>	<b>System Configuration</b>
3.1	The system consists of: <ul style="list-style-type: none"> <li>• Freezer room, walk-in type</li> <li>• Dual Refrigeration system</li> <li>• DG set</li> <li>• Voltage stabilizer</li> </ul>
<b>4</b>	<b>Technical Specifications</b>
4.1	The unit is designed to operate from a mains supply of 220/380-400 volts, 50Hz, 3 phase.
4.2	The complete unit is also designed for installation in a warehouse in order to meet temperature design standards.
4.3	Operating temperature of the freezer room is -20°C which is maintained even in environments where the ambient temperature may be as high as +45°C.
4.4	Prefabricated, modular walk-in freezer room, complete with floor, wall and ceiling panels.
4.5	Internal temperature -20°C, adjustable.
4.6	Insulation material: <ul style="list-style-type: none"> <li>• CFC free polyurethane,</li> <li>• foamed-in-place</li> <li>• density min. 40 kg/m</li> <li>• Insulation thickness minimum 120 mm</li> </ul>
4.7	Internal and external surfaces of hot-dipped galvanized steel sheet, white polyester coating, floor clad with non-slip material.
4.8	Door approx. 700-800 mm wide, 2000 mm high, with door frame heating.
4.9	Room equipped with pressure relief valve, and lighting both outside and inside with external switch and pilot lamp.
4.10	Rooms equipped with shelving system on three walls, material galvanized steel, 5 levels, minimum 530 mm deep, adjustable.
4.11	Wall mounted temperature recorder with seven days recording on circular chart, battery operated.
4.12	External dial type thermometer with remote sensor on front panel.
4.13	Room equipped with dual refrigeration system (100% stand by).
4.14	Air-cooled refrigeration units, complete plug-in type and factory tested.
4.15	Only electrical connection to be made at site.
4.16	Automatic defrosting.



<b>S.N.</b>	<b>Purchaser's Specifications</b>
4.17	Plastic strip curtain in doorway.
4.18	Door equipped with heavy duty hinges and lock with internal safety release. Suitable for operation at ambient temperature of up to +43°C, tropicalized units.
4.19	Room equipped with individual alarm systems with sound and light signals.
4.20	Refrigerant R 404, CFC-free.
4.21	<b>DG set :</b> Suitable standby generator set diesel operated, 380-400V AC 50 Hz (3P-N). Three phase depending upon voltage requirement of the cold room. The diesel tank capacity must allow for a minimum of 8 hours continuous running. Generator must have sound proof canopy. Complete installation including earthing and civil works and fitting to be done such that the smoke must be emitted outside the generator. Generator must be complete with AMF (Automatic Mains Failure) panel and battery.
4.22	<b>Servo Voltage stabilizer:</b> KVA Rating: As suitable <ul style="list-style-type: none"> <li>For three phases: Input Voltage 275-440 V 50 Hz; Output: 400 V +/- 1%, 50 Hz. Three phase four wires.</li> </ul> Common Specs: Facilities for manual control of output. Arrangements for direct supply bypassing the stabilizer in case of failures, voltmeter and indicators on front panel, suitable safety and protection devices. Quick start arrangement for bypassing restart delay.
<b>5</b>	<b>Accessories, spares and consumables</b>
5.1	All standard accessories, consumables and parts required to operate the equipment, including all standard tools and cleaning and lubrication materials, to be included in the offer. Bidders must specify the quantity of every item included in their offer (including items not specified above).
<b>6</b>	<b>Operating Environment</b>
6.1	The product offered shall be designed to be stored and to operate normally under Nepal's Power Supply, Climate, Temperature (+5 °C to +45 °C), low and high Humidity conditions.
6.2	Power input: 220-240V/ 50 Hz AC Single phase or 380-400V AC 50 Hz Three phase fitted with appropriate plugs and sockets.
<b>7</b>	<b>Standards and Safety Requirements</b>
7.1	Shall comply with appropriate WHO standard E01/CR-FR01.2 or shall be WHO PQS certified product.
7.2	Electrical and refrigeration components and the panels must have international approvals like UL, TUV, CE, NSF or equivalent.
<b>8</b>	<b>User Training</b>
8.1	Must provide user training (including how to use and maintain the equipment).
<b>9</b>	<b>Warranty</b>
9.1	Comprehensive warranty for 2 years after acceptance.
<b>10</b>	<b>Maintenance Service During Warranty Period</b>
10.1	During the warranty period supplier must ensure preventive maintenance and corrective/breakdown maintenance whenever required.
<b>11</b>	<b>Installation and Commissioning</b>
11.1	Supplier must accomplish proper installation and commissioning of the equipment on site.
<b>12</b>	<b>Documentation</b>
12.1	User (Operating) manual in English
12.2	Service (Technical / Maintenance) manual in English
12.3	List of important spare parts and accessories with their part numbers and costing.
12.4	Certificate of inspection from an independent laboratory approved/recognized by WHO/UNICEF/or internationally reputed lab.

## 8. Generator Set

### 8.1 Generator Set Diesel 5 KVA, Single Phase

S.N.	Purchaser's Specifications
	<b>Generator Set Diesel 5KVA, Single Phase</b>
	<b>Manufacturer</b>
	<b>Brand</b>
	<b>Type / Model</b>
	<b>Country of Origin</b>
<b>1</b>	<b>Description of Function</b>
1.1	Diesel driven generator set, air cooled and skid mounted, capable of delivering up to 5 KVA.
<b>2</b>	<b>Operational Re quire ments</b>
2.1	A complete diesel generator set including the diesel engine, alternator, control panel, automatic starting equipment, fuel tank and all other accessories for autonomous operation.
<b>3</b>	<b>System Configuration</b>
3.1	A complete diesel generator set including the diesel engine, alternator, control panel, automatic starting equipment, fuel tank and all other accessories for autonomous operation.
<b>4</b>	<b>Technical Specifications</b>
4.1	5 to 5.5KVA max. 4.4KW, Power factor (Cos. $\phi = 0.8$ ), 220-240VAC, Single-phase, 50Hz at NTP (Normal Temperature and Pressure) silent type maximum 50-60 dB (A) at a distance of 5metres.
4.2	<p><b>Engine:</b></p> <ul style="list-style-type: none"> <li>• Heavy duty diesel engine, with the following characteristics:</li> <li>• Single cylinder, vertical, four stoke air cooled, direct injection</li> <li>• Synchronous speed: Minimum 3000 RPM.</li> <li>• Mechanical speed governor</li> <li>• Heavy duty air cartridge filter</li> <li>• Cartridge oil filter</li> <li>• External fuel filter</li> <li>• Automatic electric starter including batteries, leads and automatic</li> <li>• Fuel: Bidders shall specify the fuel consumption per hour.</li> <li>• Battery: Prefer Maintenance Free type battery with nominal capacity minimum 35 AH with suitable voltage and current rating as required by the starter.</li> </ul>
4.3	<p><b>Fuel Tank:</b></p> <ul style="list-style-type: none"> <li>• Fuel tank of suitable construction with capacity sufficient to run the generator set continuously for 6 hours at the rated capacity.</li> <li>• Fuel level indicator should be placed conveniently on the panel board.</li> <li>• Capacity: 10 litres minimum.</li> </ul>
4.4	<p><b>Alternator:</b></p> <ul style="list-style-type: none"> <li>• Synchronous and brushless.</li> <li>• Automatic fast voltage regulator, maintaining the output within 2 % under normal conditions.</li> <li>• Screen protected.</li> <li>• CEE Sockets: single pole.</li> </ul>
4.5	<p><b>Panel Board:</b></p> <p>Made of steel sheets of appropriate thickness subjected to anti-oxidizing treatment and covered with epoxy resin with suitable protection factor.</p> <p>The panel board comprises:</p> <ul style="list-style-type: none"> <li>• Automatic main circuit breaker.</li> </ul>

<b>S.N.</b>	<b>Purchaser's Specifications</b>
	<ul style="list-style-type: none"> <li>• Key to start and stop the unit.</li> </ul>
4.6	<b>Protection:</b> <ul style="list-style-type: none"> <li>• The generator set must be equipped with automatic shutdown equipment if fatal parameters are exceeded including low oil pressure, high engine temperature and over-speed.</li> </ul>
4.7	The generator set mounted in a sound attenuated and weather protective canopy to reduce the noise level down to 50-60 dB (A) at a distance of 5metres.
4.8	Shall come with: Voltage regulator with circuit breaker, fuel level indicator, oil warning system, and AC plug with 7/22 wire 10 meters and noise suppressor.
4.9	The generator should be electric shock proof
<b>5</b>	<b>Accessories, spares and consumables</b>
5.1	<b>Accessories :</b> <ul style="list-style-type: none"> <li>• Tools kit including pipe spanners for injectors, etc.</li> <li>• Oil and air filter cartridges</li> </ul>
5.2	All standard accessories/consumables/parts required for the proper operation of the above item shall be included in the offer. Bidders shall specify, in a separate Excel worksheet, the quantity and details of any items included in this offer which have not been specified in this Technical Specifications Form.
<b>6</b>	<b>Operating Environment</b>
6.1	The product offered shall be designed to be stored and to operate normally under Nepal's Power Supply, Climate, Temperature (+5 °C to +45 °C), low and high Humidity conditions.
6.2	Unit Power supply: 220-240V/ 50 Hz AC Single phase fitted with appropriate plugs.
<b>7</b>	<b>Standards and Safety Requirements</b>
7.1	Must be USFDA or CE or UL or TUV or ARAI (Automotive Research Association of India) or any other relevant national / international standard approved product.
<b>8</b>	<b>User Training</b>
8.1	Must provide user training (including how to use and maintain the equipment).
<b>9</b>	<b>Warranty</b>
9.1	Comprehensive warranty for 2 years after acceptance.
<b>10</b>	<b>Maintenance Service During Warranty Period</b>
10.1	During the warranty period supplier must ensure corrective/breakdown maintenance whenever required.
<b>11</b>	<b>Installation and Commissioning</b>
11.1	The bidder must arrange for the equipment to be installed and commissioned by certified or qualified personnel; any prerequisites for installation to be communicated to the purchaser in advance, in detail.
<b>12</b>	<b>Documentation</b>
12.1	User (Operating) manual in English.
12.2	Service (Technical / Maintenance) manual in English.
12.3	Certificate of calibration and inspection.
12.4	List of important spare parts and accessories with their part numbers and costing.

## 8.2 Generator Set Diesel [Up to 15 KVA] Three Phase

S.N.	Purchaser's Specifications
	<b>Generator Set Diesel up to 15KVA, Three Phase</b>
	<b>Manufacturer</b>
	<b>Brand</b>
	<b>Type / Model</b>
	<b>Country of Origin</b>
<b>1</b>	<b>Description of Function</b>
1.1	Diesel driven generator set, water cooled and skid mounted, capable of delivering up to 15 KVA at 1500 rpm
<b>2</b>	<b>Operational Requirements</b>
2.1	A complete diesel generator set including the diesel engine, alternator, control panel, automatic starting equipment, fuel tank, battery, and all other accessories for autonomous operation.
<b>3</b>	<b>System Configuration</b>
3.1	Generator Set Diesel up to 15KVA, three phase, complete unit and with complete accessories.
<b>4</b>	<b>Technical Specifications</b>
4.1	<b>Rated Power:</b> 15 KVA, 12 KW, Power factor (Cos. $\phi = 0.8$ ), 400V, 3-phase, 50Hz 4 wires at NTP (Normal Temperature and Pressure).
4.2	<b>Engine:</b> Heavy duty diesel engine, with the following characteristics: <ul style="list-style-type: none"> <li>• Water-cooled with fresh water loop and tropical radiator</li> <li>• Synchronous speed: Minimum 1500 rpm</li> <li>• Mechanical speed governor</li> <li>• Heavy duty air cartridge filter</li> <li>• Cartridge oil filter</li> <li>• External fuel filter</li> <li>• Industrial silencer</li> <li>• Exhaust with suitable flexible piping</li> <li>• Automatic electric starter including batteries, leads and automatic</li> <li>• Fuel: Bidders shall specify the fuel consumption per hour.</li> <li>• Battery: Lead acid battery with nominal capacity min: 75 AH with suitable voltage and current rating as required by the starter.</li> </ul>
4.3	<b>Fuel Tank:</b> <ul style="list-style-type: none"> <li>• Fuel tank of suitable construction with capacity sufficient to run the generator set continuously for 8 hours at the rated capacity. Suitable piping must be provided for connecting the tank to the engine as well as for filling the tank</li> <li>• Fuel level indicator must be placed conveniently on the panel board</li> </ul>
4.4	<b>Alternator:</b> <ul style="list-style-type: none"> <li>• Synchronous and brushless</li> <li>• Automatic fast voltage regulator, maintaining the output within 2 % under normal conditions</li> <li>• Screen protected</li> <li>• CEE Sockets: one 3 pole and one 5 pole</li> </ul>
4.5	<b>Panel Board:</b> Made of steel sheets of appropriate thickness subjected to anti-oxidizing treatment and covered with epoxy resin with suitable protection factor. The panel board comprises: <ul style="list-style-type: none"> <li>• Automatic main circuit breaker</li> <li>• Change over switch with positions for: "MAINS" - "OFF" - "GENERATOR"</li> </ul>

<b>S.N.</b>	<b>Purchaser's Specifications</b>
	<ul style="list-style-type: none"> <li>• Key to start and stop the unit</li> <li>• Emergency stop button</li> <li>• Set-point for speed/governor control</li> <li>• Set-point for voltage control</li> <li>• Meters for: Volts (with selector switch to show phases to zero, and phase voltages), amperes (with selector switch to show current), frequency, running hours counter.</li> <li>• Acoustic and visible alarms for critical parameters including high engine temperature low oil pressure and low fuel must be provided.</li> </ul>
4.6	<p><b>Protection:</b></p> <ul style="list-style-type: none"> <li>• The generator set must be equipped with automatic shutdown equipment if fatal parameters are exceeded including low oil pressure, high engine temperature and over-speed.</li> <li>• The generator must be shock proof</li> </ul>
4.7	<p><b>Mounting:</b> The engine and the alternator must be connected with a heavy-duty elastic coupling and must be mounted on a common rigid base frame with anti-vibration dampers and lifting eyes flexible for transportation Engine, a alternator and panel must be one integrated unit mounted on skids.</p>
4.8	<p><b>Connection to ground:</b> The generator is supplied with connection to ground system comprising low resistance rod(s), terminals, cables, etc.</p>
4.9	The generator set mounted in a sound attenuated and weather protective canopy to reduce the noise level down to 70 dB (A) at a distance of 7 metres.
4.10	The generator must have Automatic Mains Failure (AMF) system.
<b>5</b>	<b>Accessories, spares and consumables</b>
5.1	<p><b>Accessories:</b></p> <ul style="list-style-type: none"> <li>• Engine coolant/antifreeze liquid for the first installation</li> <li>• Tools kit including pipe spanners for injectors, etc.</li> <li>• Oil and air filter cartridges</li> <li>• Two full sets of v-belts and a full set of cylinder head gaskets</li> <li>• A full set of replacement switches/sensors for detection of fatal parameters (low oil pressure, high engine temperature, belt failure, etc.).</li> </ul>
5.2	All standard accessories, consumables and parts required to operate the equipment, including all standard tools and cleaning and lubrication materials, to be included in the offer. Bidders must specify the quantity of every item included in the ir offer (including items not specified above).
<b>6</b>	<b>Operating Environment</b>
6.1	The product offered shall be designed to be stored and to operate normally under Nepal's Power Supply, Climate, Temperature (+5 °C to +45 °C), low and high Humidity conditions.
6.2	Unit Power supply: 400V, 3-phase 50 Hz AC fitted with appropriate plugs.
<b>7</b>	<b>Standards and Safety Requirements</b>
7.1	Must be USFDA or CE or UL or TUV or ARAI (Automotive Research Association of India) or any other relevant national / international standard approved product.
<b>8</b>	<b>User Training</b>
8.1	Must provide user training (including how to use and mainta in the equipment).
<b>9</b>	<b>Warranty</b>
9.1	Comprehensive warranty for 2 years after acceptance.
<b>10</b>	<b>Maintenance Service During Warranty Period</b>
10.1	During the warranty period supplier must ensure planned preventive maintenance (PPM) and corrective/breakdown maintenance whenever required.
<b>11</b>	<b>Installation and Commissioning</b>
11.1	The bidder must arrange for the equipment to be installed and commissioned by certified or

<b>S.N.</b>	<b>Purchaser's Specifications</b>
	qualified personnel; any prerequisites for installation to be communicated to the purchaser in advance, in detail.
<b>12</b>	<b>Documentation</b>
12.1	User (Operating) manual in English
12.2	Service (Technical / Maintenance) manual in English
12.3	List of important spare parts and accessories with their part number and costing.
12.4	Certificate of calibration and inspection from factory.

## 9. Cold Boxes

### 9.1 Cold Box - Large (Up to 20l) [Short range]

S.N.	Purchaser's Specifications	
	<b>Cold Box-Large short range</b>	
	<b>Manufacturer</b>	
	<b>Brand</b>	
	<b>Type/Model</b>	
	<b>Country of Origin</b>	
<b>1</b>	<b>Description of Function</b>	
1.1	Cold Box is essential for safe transportation of sensitive vaccines from the place of manufacturing to the place of field storage and final carriage to the place of immunization. Thus, CFC-free cold boxes ensure a pre-determined safe temperature range (+2 °C to + 8 °C) for a particular period known as cold life of the product. The cold life period varies according to the product classifications made by WHO i.e. for large equipment like cold boxes, the cold life is high whereas for small equipment like vaccine carriers the cold life requirement is less.	
<b>2</b>	<b>Operational Requirements</b>	
2.1	The large cold box, short range must be able to keep the vaccine safe while transporting to short distances.	
<b>3</b>	<b>System Configuration</b>	
3.1	The system consists of: <ul style="list-style-type: none"> <li>• Cold Box-large short range</li> <li>• CFC free, PUF insulation</li> <li>• Carrying handles</li> <li>• Ice packs</li> </ul>	
<b>4</b>	<b>Technical Specifications</b>	
4.1	Vaccine cold box, large, short range: <ul style="list-style-type: none"> <li>• Vaccine storage capacity:15 litres or more</li> <li>• Cold life minimum 48 hours.</li> </ul>	
4.2	External surface and internal lining material: Polyurethane	
4.3	Shall maintain cold life minimum 48 hours or more at 43°C without opening the cold box.	
4.4	Shall come with hinged lid.	
4.5	Weight fully loaded must be less than 40kg.	
4.6	Weight empty (with empty ice pack) must be less than 15kg.	
4.7	Insulation material: Polyurethane foamed.	
4.8	Insulation thickness: At least 60mm.	
4.9	Shall provide with one full set of 0.3 or 0.4 or 0.6 litre ice packs.	
<b>5</b>	<b>Accessories, spares and consumables</b>	
5.1	Shall provide extra set of ice packs.	
<b>6</b>	<b>Operating Environment</b>	
6.1	Cold life minimum 48 hours or more at 43°C without openings.	
<b>7</b>	<b>Standards and Safety Requirements</b>	
7.1	Shall meet WHO Standard WHO/PQS/E004/CB 3. Bidder shall provide the WHO PQS report.	
7.2	The system shall be tested as per WHO Standard Test procedures as per E4/PROC/1.	
<b>8</b>	<b>User Training</b>	
8.1	Not applicable.	

<b>9</b>	<b>Warranty</b>
9.1	Warranty for 1 year after acceptance.
<b>10</b>	<b>Maintenance Service During Warranty Period</b>
10.1	Standard warranty conditions are applicable.
<b>11</b>	<b>Installation and Commissioning</b>
11.1	Must supply preassembled unit, ready to use.
<b>12</b>	<b>Documentation</b>
12.1	Manufacturer's certification of compliance of test procedures as per WHO Standards Test Procedures.
12.2	Inspection Certificate from manufacturer to be in compliance with WHO specification as specified above.
12.3	<b>Manual(s):</b> Manual(s) with clear descriptions for users and refrigeration technicians. The manual(s) shall be provided in the English language.
12.4	<b>Packing:</b> Labels bearing handling instructions shall be highly visible and printed clearly on the outer packing.



## 9.2 Cold Box - Large (Above 20l) [Long range]

S.N.	Purchaser's Specifications
	<b>Cold Box–Large long range</b>
	<b>Manufacturer</b>
	<b>Brand</b>
	<b>Type/Model</b>
	<b>Country of Origin</b>
<b>1</b>	<b>Description of Function</b>
1.1	Cold Box is essential for the safe transportation of sensitive vaccines from the place of manufacturing to the place of field storage and final carriage to the place of immunization. Thus, CFC-free cold boxes ensure a pre-determined safe temperature range (+2 to + 8 °C) for a particular period known as cold life of the product. The cold life period varies according to the product classifications made by WHO i.e. for large equipment like cold boxes, the cold life is high whereas for small equipment like vaccine carriers the cold life requirement is less.
<b>2</b>	<b>Operational Requirements</b>
2.1	The large cold box, long range must be able to keep the vaccine safe while transporting to long distances for longer hours of time.
<b>3</b>	<b>System Configuration</b>
3.1	The system consists of: <ul style="list-style-type: none"> <li>• Cold Box – large long range</li> <li>• CFC free, PUF insulation</li> <li>• Carrying handles</li> <li>• Ice packs</li> </ul>
<b>4</b>	<b>Technical Specifications</b>
4.1	Vaccine cold box, large, long range: <ul style="list-style-type: none"> <li>• Vaccine storage capacity minimum 20 litres</li> <li>• Minimum 96 hours of cold life, preference will be given to longer cold life</li> </ul>
4.2	External surface and internal lining material: Polyethylene
4.3	Shall maintain cold life minimum 96 hours at 43°C without opening the cold box
4.4	Shall come with hinged lid.
4.5	Weight fully loaded must be less than 50kg.
4.6	Weight empty (with empty ice pack) must be less than 25kg.
4.7	Insulation material: Polyurethane foamed.
4.8	Insulation thickness: At least 100mm.
4.9	Shall provide with one full set of icepacks.
<b>5</b>	<b>Accessories, spares &amp; consumables</b>
5.1	Shall provide extra set of ice packs.
<b>6</b>	<b>Operating Environment</b>
6.1	Cold box shall maintain cold life requirements for a minimum of 96 hours without opening, when the constant ambivalent temperature is 43 <sup>o</sup> C.
<b>7</b>	<b>Standards and Safety Requirements</b>
7.1	Shall meet WHO Standard E4/CB.2. Bidder shall provide the WHO PQS report.
7.2	The system shall be tested as per WHO Standard Test procedure as per E4/PROC/1.
<b>8</b>	<b>User Training</b>
8.1	Not applicable.
<b>9</b>	<b>Warranty</b>
9.1	Warranty for 1 year.

<b>10</b>	<b>Maintenance Service During Warranty Period</b>
10.1	Standard warranty conditions are applicable.
<b>11</b>	<b>Installation and Commissioning</b>
11.1	Must supply preassembled unit, ready to use.
<b>12</b>	<b>Documentation</b>
12.1	Manufacturer's certification of compliance of test procedures as per WHO Standards Test Procedures.
12.2	Inspection Certificate from manufacturer to be complying with WHO specification as specified above.
12.3	<b>Manual(s):</b> Manual(s) with clear descriptions for users. The manual(s) shall be provided in the English language.
12.4	<b>Packing:</b> Labels bearing handling instructions shall be highly visible and printed clearly on the outer packing.

## 10. Vaccine Carrier

### 10.1 Vaccine Carrier - Large [Minimum 1.4l]

S.N.	Purchaser's Specifications
	<b>Vaccine Carrier-large</b>
	<b>Manufacturer</b>
	<b>Brand</b>
	<b>Type/Model</b>
	<b>Country of Origin</b>
<b>1</b>	<b>Description of Function</b>
1.1	Vaccine Carrier is essential for safe transportation of sensitive vaccines from the place of manufacturing to the place of field storage and final carriage to the place of immunization. Thus, CFC-free vaccine carriers ensure a pre-determined safe temperature range (+2 to + 8 °C) for a particular period known as cold life of the product. The cold life period varies according to the product classifications made by WHO i.e. for large equipment like cold boxes, the cold life is high whereas for small equipment like vaccine carriers the cold life requirement is less.
<b>2</b>	<b>Operational Requirements</b>
2.1	To carry vaccine, for small one-day immunization outreach sessions.
<b>3</b>	<b>System Configuration</b>
3.1	The system consists of: <ul style="list-style-type: none"> <li>• Vaccine Carrier-large</li> <li>• CFC free, PUF insulation</li> </ul>
<b>4</b>	<b>Technical Specifications</b>
4.1	Vaccine carrier: <ul style="list-style-type: none"> <li>• Vaccine storage capacity minimum 1.4</li> <li>• Cold life minimum 32 hours</li> </ul>
4.2	Cold life without openings: minimum 32 hrs. at +43°C, preference will be given to longer cold life
4.3	Weight fully loaded must be less than 5kg.
4.4	Weight empty (with empty ice pack) must be less than 3kg.
4.7	Insulation Material: Polyurethane
4.8	Insulation Thickness: minimum 35mm
4.9	Lid type & fixings: Removable
4.10	Shall provide with one set of 0.3 or 0.4 litre ice packs.
<b>5</b>	<b>Accessories, spares and consumables</b>
5.1	Shall provide extra set of ice packs.
<b>6</b>	<b>Operating Environment</b>
6.1	Cold life minimum 32 hours at 43°C without openings.
<b>7</b>	<b>Standards and Safety Requirements</b>
7.1	Shall meet WHO Standard E4/VC2. Bidder shall provide the WHO PQS report.
7.2	The system shall be tested as per WHO Standard Test procedures as per E4/PROC/1.
<b>8</b>	<b>User Training</b>
8.1	Not applicable.
<b>9</b>	<b>Warranty</b>
9.1	Warranty for 1 year after acceptance.
<b>10</b>	<b>Maintenance Service During Warranty Period</b>
10.1	Standard warranty conditions are applicable.

<b>S.N.</b>	<b>Purchaser's Specifications</b>
<b>11</b>	<b>Installation and Commissioning</b>
11.1	Must supply preassembled unit, ready to use.
<b>12</b>	<b>Documentation</b>
12.1	Manufacturer's certification of compliance of test procedures as per WHO Standards Test Procedures.
12.2	Inspection Certificate from manufacturer to be complying with WHO specification as specified above.
12.3	<b>Manual(s):</b> Manual(s) with clear descriptions for users. The manual(s) shall be provided in the English language.
12.4	<b>Packing:</b> Labels bearing handling instructions shall be highly visible and printed clearly on the outer packing.

## 10.2 Vaccine Carrier - Extra Large [Minimum 2.4l]

S.N.	Purchaser's Specifications	
	<b>Vaccine Carrier</b>	
	<b>Manufacturer:</b>	
	<b>Brand:</b>	
	<b>Type/Model:</b>	
	<b>Country of Origin:</b>	
<b>1</b>	<b>Description of Function</b>	
1.1	To carry vaccine, for immunization outreach sessions.	
<b>2</b>	<b>Operational Requirements</b>	
2.1	Cold life minimum 32 hours at 43°C without openings.	
<b>3</b>	<b>System Configuration</b>	
3.1	The system consists of: <ul style="list-style-type: none"> <li>• Vaccine Carrier</li> <li>• CFC free, PUF insulation</li> </ul>	
<b>4</b>	<b>Technical Specifications</b>	
4.1	Vaccine carrier: <ul style="list-style-type: none"> <li>• Vaccine storage capacity minimum 2.4 litres</li> <li>• Cold life 32 hours.</li> </ul>	
4.2	Cold life without openings: 32 hrs. at +43°C.	
4.3	Weight fully loaded: Approx. 6.5kg.	
4.4	Weight Empty: Approx. 1.8kg.	
4.5	Insulation Material: Polyurethane	
4.6	Insulation Thickness: Minimum 25 mm.	
4.7	Lid type & fixings: Removable	
<b>5</b>	<b>Accessories, spares and consumables</b>	
5.1	Number of Ice packs to be supplied with the carrier: 2 sets of ice packs	
<b>6</b>	<b>Operating Environment</b>	
6.1	Cold life minimum 32 hours at 43°C without openings.	
<b>7</b>	<b>Standards and Safety Requirements</b>	
7.1	Shall meet WHO Standard E4/VC2.	
7.2	The system shall be tested as per WHO Standard Test procedures as per E4/PROC/1.	
<b>8</b>	<b>User Training</b>	
8.1	Not applicable.	
<b>9</b>	<b>Warranty</b>	
9.1	Warranty for 1 year after acceptance.	
<b>10</b>	<b>Maintenance Service During Warranty Period</b>	
10.1	Standard warranty conditions are applicable.	
<b>11</b>	<b>Installation and Commissioning</b>	
11.1	Must supply preassembled unit, ready to use.	
<b>12</b>	<b>Documentation</b>	
12.1	Manufacturer's certification of compliance of test procedures as per WHO Standards Test Procedures.	
12.2	Inspection Certificate from manufacturer to be complying with WHO specification as specified above.	

12.3	<b>Manual(s):</b> Manual(s) with clear descriptions for users. The manual(s) shall be provided in the English language.
12.4	<b>Packing:</b> Labels bearing handling instructions shall be highly visible and printed clearly on the outer packing.

## 11. Icepack

### 11.1 Icepack (0.3l)

S.N.	Purchaser's Specifications	
	<b>Ice pack (0.3l)</b>	
	<b>Manufacturer</b>	
	<b>Brand</b>	
	<b>Type/Model</b>	
	<b>Country of Origin</b>	
<b>1</b>	<b>Description of Function</b>	
1.1	Ice-packs are used for the transport of vaccines and other biological specimens and thus ensure the cold chain during transport and immunization activities in field locations.	
<b>2</b>	<b>Operational Requirements</b>	
2.1	Ice-pack or water-pack frozen to a temperature between -5°C and -20°C before use.	
<b>3</b>	<b>System Configuration</b>	
3.1	0.3 litre Ice-pack with screw cap.	
<b>4</b>	<b>Technical Specifications</b>	
4.1	Capacity: 0.3 litres	
4.2	Water content: 0.25 to 0.3 litres	
4.3	External dimensions: 163 x 94 x 34 mm, +/- 2 mm.	
4.4	Ice-pack walls to be reinforced in order to prevent swelling.	
4.5	It shall come with removable cap, with internal water seal to prevent leakage.	
4.6	It shall have filling line indicated on one side.	
4.7	It shall have 2 holes for keeping vaccine vials.	
<b>5</b>	<b>Accessories, spares and consumables</b>	
5.1	Not applicable.	
<b>6</b>	<b>Operating Environment</b>	
6.1	The product offered shall be designed to be stored and to operate normally under Nepal's Power Supply, Climate, Temperature (+5 °C to +45 °C), low and high Humidity conditions.	
<b>7</b>	<b>Standards and Safety Requirements</b>	
7.1	Shall meet WHO Standard E005/IP01-VP.2. Bidder must provide the WHO PQS prequalified certificate.	
7.2	The system shall be tested as per WHO Standard Test procedures as per E4/PROC/1.	
<b>8</b>	<b>User Training</b>	
8.1	Not applicable.	
<b>9</b>	<b>Warranty</b>	
9.1	Warranty for 1 year after acceptance.	
<b>10</b>	<b>Maintenance Service During Warranty Period</b>	
10.1	Standard warranty conditions are applicable.	
<b>11</b>	<b>Installation and Commissioning</b>	
11.1	Must supply preassembled unit, ready to use.	
<b>12</b>	<b>Documentation</b>	
12.1	Manufacturer's certification of compliance of test procedures as per WHO Standards Test Procedures.	
12.2	Inspection Certificate from manufacturer to be complying with WHO specification as specified above.	

12.3	<b>Manual(s):</b> Manual(s) with clear descriptions for users. The manual(s) shall be provided in the English language.
12.4	<b>Packing:</b> Labels bearing handling instructions shall be highly visible and printed clearly on the outer packing.



## 11.2 Icepack [0.4l]

S.N.	Purchaser's Specifications	
	<b>Ice pack (0.4l)</b>	
	<b>Manufacturer</b>	
	<b>Brand</b>	
	<b>Type/Model</b>	
	<b>Country of Origin</b>	
<b>1</b>	<b>Description of Function</b>	
1.1	Ice-packs are used for the transport of vaccines and other biological specimens and thus ensure the cold chain during transport and immunization activities in field locations.	
<b>2</b>	<b>Operational Requirements</b>	
2.1	Ice-pack or water-pack frozen to a temperature between -5°C and -20°C before use.	
<b>3</b>	<b>System Configuration</b>	
3.1	0.4 litre Ice-pack with screw cap.	
<b>4</b>	<b>Technical Specifications</b>	
4.1	Capacity: 0.4 litres	
4.2	Water content: 0.35 to 0.4 litres	
4.3	External dimensions: 163 x 94 x 34 mm, +/- 2 mm.	
4.4	Ice-pack walls to be reinforced in order to prevent swelling.	
4.5	It shall come with removable cap, with internal water seal to prevent leakage.	
4.6	It shall have filling line indicated on one side.	
4.7	It shall have 2 holes for keeping vaccine vials.	
<b>5</b>	<b>Accessories, spares and consumables</b>	
5.1	Not applicable.	
<b>6</b>	<b>Operating Environment</b>	
6.1	The product offered shall be designed to be stored and to operate normally under Nepal's Power Supply, Climate, Temperature (+5 °C to +45 °C), low and high Humidity conditions.	
<b>7</b>	<b>Standards and Safety Requirements</b>	
7.1	Shall meet WHO Standard E005/IP01-VP.2. Bidder must provide the WHO PQS prequalified certificate.	
7.2	The system shall be tested as per WHO Standard Test procedures as per E4/PROC/1.	
<b>8</b>	<b>User Training</b>	
8.1	Not applicable.	
<b>9</b>	<b>Warranty</b>	
9.1	Warranty for 1 year after acceptance.	
<b>10</b>	<b>Maintenance Service During Warranty Period</b>	
10.1	Standard warranty conditions are applicable.	
<b>11</b>	<b>Installation and Commissioning</b>	
11.1	Must supply preassembled unit, ready to use.	
<b>12</b>	<b>Documentation</b>	
12.1	Manufacturer's certification of compliance of test procedures as per WHO Standards Test Procedures.	
12.2	Inspection Certificate from manufacturer to be complying with WHO specification as specified above.	
12.3	<b>Manual(s):</b> Manual(s) with clear descriptions for users. The manual(s) shall be provided in the English language.	
12.4	<b>Packing:</b> Labels bearing handling instructions shall be highly visible and printed clearly on the outer packing.	

### 11.3 Icepack (0.6l)

S.N.	Purchaser's Specifications	
	<b>Ice pack (0.6l)</b>	
	<b>Manufacturer</b>	
	<b>Brand</b>	
	<b>Type/Model</b>	
	<b>Country of Origin</b>	
<b>1</b>	<b>Description of Function</b>	
1.1	Ice-packs are used for the transport of vaccines and other biological specimens and thus ensure the cold chain during transport and immunization activities in field locations.	
<b>2</b>	<b>Operational Requirements</b>	
2.1	Ice-pack or water-pack frozen to a temperature between -5°C and -20°C before use.	
<b>3</b>	<b>System Configuration</b>	
3.1	0.6 litre Ice-pack with screw cap.	
<b>4</b>	<b>Technical Specifications</b>	
4.1	Capacity: 0.6 litres	
4.2	Water content: 0.55 to 0.6 litres	
4.3	External dimensions: 163 x 94 x 34 mm, +/- 2 mm.	
4.4	Ice-pack walls to be reinforced in order to prevent swelling.	
4.5	It shall come with removable cap, with internal water seal to prevent leakage.	
4.6	It shall have filling line indicated on one side.	
4.7	It shall have 2 holes for keeping vaccine vials.	
<b>5</b>	<b>Accessories, spares and consumables</b>	
5.1	Not applicable.	
<b>6</b>	<b>Operating Environment</b>	
6.1	The product offered shall be designed to be stored and to operate normally under Nepal's Power Supply, Climate, Temperature (+5 °C to +45 °C), low and high Humidity conditions.	
<b>7</b>	<b>Standards and Safety Requirements</b>	
7.1	Shall meet WHO Standard E005/IP01-VP.2. Bidder must provide the WHO PQS prequalified certificate.	
7.2	The system shall be tested as per WHO Standard Test procedures as per E4/PROC/1.	
<b>8</b>	<b>User Training</b>	
8.1	Not applicable.	
<b>9</b>	<b>Warranty</b>	
9.1	Warranty for 1 year after acceptance.	
<b>10</b>	<b>Maintenance Service During Warranty Period</b>	
10.1	Standard warranty conditions are applicable.	
<b>11</b>	<b>Installation and Commissioning</b>	
11.1	Must supply preassembled unit, ready to use.	
<b>12</b>	<b>Documentation</b>	
12.1	Manufacturer's certification of compliance of test procedures as per WHO Standards Test Procedures.	
12.2	Inspection Certificate from manufacturer to be complying with WHO specification as specified above.	
12.3	<b>Manual(s):</b> Manual(s) with clear descriptions for users. The manual(s) shall be provided in the English language.	
12.4	<b>Packing:</b> Labels bearing handling instructions shall be highly visible and printed clearly on the outer packing.	

## **Annex 1: List of Participants**

## Workshop on Development of Technical Specification of Cold Chain Equipment

<b>Name</b>	<b>Designation</b>	<b>Organization</b>
Dr. Bhim Singh Tinkari	Director	LMD/DoHS
Dinesh Kumar Chapagain	Sr. PHA	LMD
Bade Babu Thapa	Section Chief/Cold Chain and Vaccine Management	LMD
Dr. YV Pradhan	EPI Program Expert (Consultant)	LLN
Swatantra Raj Joshi	Mechanical Engineer	LMD
Santosh Mishra	Mechanical Engineer	LMD
Om Prasad Upadhyay	EPI Supervisor Officer	LMD
Krishna Pd. Subedi	EPI Officer	LMD
Gyan Bahadur BC	PHI	LMD
Deepak Adhikari	PHO	LMD
Rebati Thapa	Health Assistant	LMD
Hari Pd. Acharya	Health Assistant	LMD
Sujit Banskota	Biomedical Engineer	NHSSP
Dr. J.N. Giri	Immunization Coordinator	WHO
Dr. Ashish KC	Child Health Specialist	UNICEF
Dr. Nurdin Kadyrov	Consultant	UNICEF
Joseph Pett	Consultant	UNICEF
Dr. Janardan Lamichhane	Chairman	LLN
Sushil Karki	CEO	LLN
KB Chand	DC, UNICEF PCA	LLN

## Meeting for Review and Finalization of Technical Specification of Cold Chain Equipment

<b>Name</b>	<b>Designation</b>	<b>Organization</b>
Dr. Bhim Singh Tinkari	Director	LMD/DoHS
Dr. KP Poudel	Director	CHD/DoHS
Baburam Lamichhane	Under Secretary	LMD/DoHS
Mukunda Raj Gautam	Sr. PHA	CHD
Dinesh Kumar Chapagain	Sr. PHA	LMD
Bade Babu Thapa	Section Chief/Cold Chain and Vaccine Management	LMD
Quazi Wasiuddin	Biomedical Engineer	NHSSP
Mohan Maharjan	Electrical Engineer	LMD
Sujit Banskota	Biomedical Engineer	NHSSP
Swatantra Raj Joshi	Mechanical Engineer	LMD
Anuj Purush Dhakal	Biomedical Engineer	LMD
Santosh Mishra	Mechanical Engineer	LMD
Radha Krishna Paudel	PHO	CHD/DoHS
Krishna Pd. Subedi	EPI Officer	LMD
Om Prasad Upadhyay	EPI Supervisor	LMD
Bharat Bhandari	ISO	CHD
Krishna B. Malla	EPI Officer	LMD
Kushu Ram Adhikari	EPI Officer	LMD
Surya Bdr. Khadka	ISO	CHD
Bijaya Kranti Shakya	PHO	NHTC
Dr. J.N. Giri	Immunization Coordinator	WHO, IPD
Buddhi Maharjan	CCO	WHO, IPD
Dr. Ashish KC	Child Health Specialist	UNICEF
Dr. Nurdin Kadyrov	Consultant	UNICEF
Joseph Pett	Consultant	UNICEF
Shiva Subedi	Consultant	UNICEF
Sushil Karki	CEO	LLN
KB Chand	District Coordinator, UNICEF PCA	LLN
Pawan Dahal	Cold Chain Supervisor, UNICEF PCA	LLN
Bonita Sharma	Dc/a and Documentation Officer, UNICEF PCA	LLN
Bibek Thapa	CC Monitoring and Documentation Officer, UNICEF PCA	LLN

**Annex 2: Technical Specification Approval Letter from MoHP**



नेपाल सरकार  
स्वास्थ्य तथा जनसंख्या मन्त्रालय  
आर्थिक प्रशासन शाखा

स्वास्थ्य तथा जनसंख्या मन्त्रालय  
रामशाहपथ, काठमाडौं

पत्र संख्या:-०७२/७३

च.नं. :- ३५०

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२६२५४३

रामशाहपथ  
काठमाडौं, नेपाल ।  
मिति : २०७२।१।२९

बिषय : कोल्डचेन उपकरणको Technical Specification सम्बन्धमा ।

श्री स्वास्थ्य सेवा विभाग

टेकु ।

उपरोक्त बिषयमा सार्वजनिक खरिद ऐन २०६३ को दफा १३(२) (क) तथा सार्वजनिक खरिद नियमावली २०६४ को नियम ८(३) (क) ११(१) र २५ (१) (ग) मा भएको व्यवस्था अनुसार मालसामान खरिदको प्राविधिक स्पेशिफिकेशन निर्धारण गर्ने जिम्मेवारी र जवाफदेहिता सम्बन्धित सार्वजनिक निकायको नै रहेको देखिन्छ ।

अतः प्रस्तुत कोल्डचेन ईक्वीपमेन्टहरुको स्पेशिफिकेशन तयार गर्दा प्रचलित खरिद कानूनमा भएको व्यवस्था परिपालना गरी आवश्यक गुणस्तरलाई कायम राख्ने तथा प्रतिस्पर्धा सिमिति नहुने गरी तयार गर्न नीतिगत निर्देशन दिन मिति २०७२।१।२७ को नेपाल सरकार सचिवस्तरको निर्णयनुसार अनुरोध गर्दछु ।

(सुरेश शर्मा)

लेखा अधिकृत