



## SPECIFICATION

### Liquid nitrogen generator

#### 1. Scope

1.1 This specification describes the requirements for a liquid nitrogen generator (hereinafter referred to as the “LN2 Plant”) in support of the Technical Cooperation project RER7015. The LN2 plant shall provide liquid nitrogen for deep freezing of sediment and other environmental samples. The liquid nitrogen shall also be used for the storage of organic samples.

1.2 The LN2 Plant shall be supplied to the Ukrainian Hydro-Meteorological Institute, Department of Environment Radioactivity Monitoring, 37, Prospekt Nauki, 03028 Kyev, Ukraine (hereinafter referred to as the “End-User”).

#### 2. Requirements

The LN2 Plant shall:

- 2.1. Produce  $\geq 20$  liters per day ( $\geq 0.84$  liters per hour);
- 2.2. Have a minimum (Dewar) container capacity = 35 liters;
- 2.3. Be compatible with a power supply of 220V/50Hz-60Hz;
- 2.4. Be suitable for an environment temperature of 15 to 45°C;
- 2.5. Use air cooling, internal air compressor;
- 2.6. Produce  $\geq 99\%$  pure liquid nitrogen;
- 2.7. Contain nitrogen injection system for pre-cooling of gas prior to liquefaction;
- 2.8. Have all cryogenic parts vacuum isolated;
- 2.9. Include an intelligent level sensor system;
- 2.10 Include additional 100 liters storage Dewar with a liquid nitrogen transfer hose, minimum 1.5 meters, with connection accessories;
- 2.11. Produce noise  $< 60$  dBA.

#### 3. Marking

The LN2 Plant shall have all safety markings in the English and Russian languages.

#### 4. Packing

The LN2 Plant, for the shipment by air to the End-User, shall be packed in accordance with international standards that are applicable for the shipment by air of this kind of equipment.

#### 5. Quality Requirements

5.1. The LN2 Plant shall be manufactured, shipped and installed in accordance with the Contractor’s/manufacturer’s ISO quality assurance system or an equivalent quality assurance system.

5.2. The Contractor shall document the compliance with this quality assurance system.



## 6. Testing and Acceptance

The LN2 Plant, prior to shipment, shall be tested for conformance of the LN2 Plant with manufacturer's performance specifications and the minimum requirements specified herein.

## 7. Installation and Training

The Contractor shall support installation of the LN2 Plant at the End-User's premises and by providing either a one (1) day on-site or remote training (depending on potential travel limitations) in the English or official language of the End-User on system operation and application for up to three (3) staff designated by the End-User.

## 8. Deliverable Data Items

The Contractor shall deliver the LN2 Plant with the following data items in the English and Russian languages:

- 8.1. Installation and site preparation instructions;
  - 8.2. LN2 Plant operation manuals and maintenance manuals in hard copy and electronic copy in the English and Russian languages;
  - 8.3. LN2 operation tutorial book(s) in hard copy and electronic copy; and
  - 8.4. List of suggested spare parts, with guaranteed availability for at least five (5) years from delivery.
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