ANNEXURE-I

1. **Application:** Powered Air Purifying Respirator (PAPR) provides respiratory protection to the radiation workers against air borne contamination in the nuclear industry during normal operation and maintenance work.

2. **Scope of supply:**
   a) It shall also include packaging and safe delivery to the site.
   b) Supplier should submit the detail specification and catalog of half mask along with offer.
   c) Detailed operating and maintenance manual shall be supplied with respirator.
   d) The manufacturer shall ensure good workmanship and reliability for PAPR.
   e) Pre-dispatch inspection & testing of the half mask and spares by user at the suppliers' premises.

3. **Bid evaluation criteria: -** The indented items are interdependent; hence bids submitted will be evaluated on overall technically suitable lowest basis.

4. **Bidder's qualifications criteria:-**The bids submitted by the qualified bidders will only be considered for techno commercial evaluation. Bidders will be qualified after compliance of following criteria.
   The following technical document shall be uploaded on the DPS e-tender portal while submitting the bid.
   a) Make and model of the quoted products against tendered items.
   b) Data sheets of technical specification and features available in items of OEM of all the quoted items.
   c) Certificate of OEM or authorized dealers/service centres/system house/preferred channel partners of OEM (not more than two year older form tender opening date). In case OEM is unable to quote directly, a letter of authorization for supply and after sales service in favour of the bidder from the OEM must be submitted along with the bid.

   Bidders shall remain informed that the information and conditions mentioned above are mandatory for techno commercial evaluation of the bids and shall be complied/submitted /uploaded along with the bid itself on DAE portal (etenders.dpsdae.gov.in). The offer will be treated invalid and will not be considered for techno commercial evaluation if the bidders fails to full fill the qualification criteria.

5. **Detail Technical Specification:**
   1. Each unit of battery powered respirator should have one P-3 type or equivalent filter, two battery operated Fan Motor, a Bump cap and face shield with neck cap without trailing hoses integrated together.
   2. Respiratory protection factor of Powered Respirator should not be less than 500 for 0.3 micron size of particulate activity. It should have EN certification No. 81976 as per EN 12941 TH3P.
   3. Weight of the integrated piece of respirator should be less than 1500 gm.
   4. It should have a sophisticated Electronics Systems Management (ESM) with CPU and LED display system for continuous monitoring of the flow rate, speed of fan motor and life of battery.
   5. There should be 4 LED head mounted display to provide the indication of all monitored parameters.
   6. Power respirator should be an Approved Integrated system for Head, face, eye & Respiratory Protection.
   7. Battery charging time shall be less than 3 hours.
   8. **P-3 Type or equivalent filter**
      8.1 Minimum Particulate removing efficiency: not less than 99.97% for 0.3 micron size of particulates. For other particle size efficiency should be more than 99.97%.
      8.2 Filter surface area should not be less than 3000 sq. cm with 100 % utilization of filters.
      8.3 Filter cartridge should be compatible with the PAPR respirator.
   9. **Bump cap**
      9.1 It should have EN 812 and AS1337 certified bump cap for head protection.
      9.2 It should house the twin NiMH batteries, P3 or equivalent filter and fan motor as one assembly.

9.3 It should have ON/ OFF switch for switching the Powered respirator on or off.

9.4 It should have 4 point cradle and fail safe ratchet control system for proper fit on any shape or size of head.

9.5 It should have Polycarbonate high impact anti mist and scratch face shield and attached neck cape with exhalation patch which is to be tied around the neck by a lockable system.

10. Fan Motor

10.1 There should be in-built self regulated motor speed control device and it should deliver a constant 170 lpm flow rate.

10.2 A switch should be available on chin to boost flow up to 190 lpm, if required.

10.3 Noise level of fan should be less than 70 db.

10.4 Fan motor should be well insulated.

11. Battery:

11.1 PARP respirator shall have light weight two battery packs.

11.2 Each battery pack shall be made of 4 AA size NiMH batteries

11.3 Each Battery pack shall have nominal voltage of 4.8 V and capacity 1.8 Ah

11.4 Fully charged battery pack shall run for 8 hrs with normal air flow

11.5 Recharging rate of battery pack from fully discharged condition shall be less than 3hrs.

12. Battery Charger:

12.1 There should be twin light weight multi pin smart battery charger associated with each respirator unit.

12.2 Output voltage /current of the charger should be 10 v dc/800 mA.

12.3 Battery charging time shall be less than 3 hours.

11. It should have a sophisticated Electronics Systems Management (ESM) with Head Mounted Display (HMD) to continuously monitors all functions and should have battery life check as given below.

Audio pre-use-check	3 Green LED ON; Red LED and audible warning
Filter OK	3 Green LED ON
Filter OK	2 Green LED ON – indicating filter usage
Filter alert	1 Red ON – replacement/low air flow
Filter alert	1 Red LED ON–audible warning for replacement/blocked hose
Air flow boost mode	Green LED flashing
Low battery alert	All LEDs ON; audible warning

12. Power respirator should be provided with four unique Head Mounted LED display at the chin which gives step by step indication of the deterioration of the life of filter and battery. It should also have the audible warning system.
13. The CPU of the ESM should monitor the flow rate more than or equal to 40 times per minute and adjusts the fan motor speed to deliver a constant 170 LPM flow rate channeled directly to the face with 190 LPM Boost flow.
14. Power respirator should not have any Trailing Leads, Supply hoses or waist mounted filters.
15. Power respirator should have warranties for all the components, parts, and assemblies supplied against any defects in material for a period of at least 12 months, commencing from the date of final acceptance by the indenter.