

# Build Health International

## Technical Assistance Services

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Build Health International (BHI) is contracted by the Global Fund to provide end-to-end technical assistance for pressure swing adsorption (PSA) plant procurement and implementation. The list below includes an overview of the technical assistance BHI can provide at every phase of Project BOXER, a centrally managed limited investment (CMLI) that uses COVID-19 Response Mechanism funding to strengthen medical oxygen programs in implementing countries.

### Phase 1: Plant Specifications and Ordering

1. **Specification Development:** Evaluate estimated oxygen needs and appropriate delivery methods to recommend an appropriate PSA plant production capacity, considering budget limitations and support requirements for peripheral facilities.
2. **Phase 1 Site Visit:** Visit the proposed PSA plant sites to conduct site assessments. Site assessments in phase 1 can include the following activities:
  - Perform an oxygen need and gap assessment to develop a recommendation for the PSA plant capacity and configuration.
  - Assess the hospital infrastructure and power supply system to identify issues that need to be addressed prior to plant installation. This on-site evaluation will help to determine the best location for the installation of the PSA plant and the essential elements of site preparation needed for the successful installation, commissioning and operation of the PSA plant.
  - Perform a general evaluation of physical access to the designated location for PSA plant delivery and subsequent cylinder distribution.
  - Discuss and determine the needs for capacity building and training for technical and/or management and administrative staff, responsible for the operations and maintenance of oxygen systems in the context of the local operating environment.
3. **Finalize Plant Layout:** Support the supplier and the PR to finalize plant layout and plans considering space constraints operational and programmatic needs.
4. **Procurement and Delivery Guidance:** Provide guidance on all technical matters that arise during the procurement and delivery process.

### Phase 2: Site Preparation and Installation

1. **Site Readiness Guidance:** Guide conversations about technical considerations for site preparations with the PR and the health facilities and sites receiving PSA plants, including identifying general infrastructure requirements.
2. **Site Readiness Budgeting Support:** Provide budgeting tools for operations and facility management to develop an overall operating budget.
3. **Phase 2 Site Visit:** Visit the designated PSA plant sites to conduct site assessments. Site assessments can include the following activities:

- Assess the existing infrastructure and power supply system to identify issues that need to be addressed prior to installation. This on-site evaluation will help to determine the best location for the installation of the PSA unit and the necessary work on site to enable the successful installation and operation of the PSA unit. This assessment is particularly valuable when the plant was procured without the development of customized specifications specifically designed for the hospital or region and its individual needs.
- Perform a general evaluation of access for PSA plant delivery and cylinder distribution.
- Assess potential locations for the PSA plant.
- Take measurements and gather information to prepare engineering and architectural drawings.

#### 4. Drawing and Bill of Quantities Support

- Review site work drawings and bill of quantities (BoQs) developed by local contractors and designers. This review will include an assessment of completeness and appropriate quantities and will not include an assessment of unit prices.
- Use BHI's own architectural and engineering staff to develop design documents and BoQs for the required scope. Due to the varying nature of local material and labor costs, as well as BHI's limited visibility into accurate local unit pricing across 50+ countries supported by Project BOXER, BHI is not able to provide detailed and site-specific pricing or cost feedback for local infrastructure works in BoQs.
- This level of support is provided only when utilizing local designers is not a viable option.

#### 5. Tender Support

- Review PR developed tender documents prior to initiating the tender process.
- Provide an independent review of bids from contractors and a technical evaluation.

#### 6. HR Support

- Review PSA plant staffing/human resource proposals including CV's and recommend appropriate qualifications for the required staff.
- Evaluate the capacity of existing facility staff members to manage PSA plant operational activities
- Evaluate the qualifications of and terms of reference for potential project managers overseeing the site readiness work.
- Review Gantt charts developed by the PR/project managers to ensure all relevant steps in the site readiness process are addressed.

7. **Quality Assurance Site Visit:** Visit the site to observe the completed or in-progress construction work and review for general conformance with the approved design documents and specifications. This does not replace supplier site inspections or other construction inspections required by local authorities.

## Phase 3: Training

1. **Maintenance Training** (5 days): In-person training with plant operators and biomedical technicians to supplement the manufacturer provided in-person training. This training can be developed to cover specific needs within each country/context and will include a mix of hands-on training and classroom style learning. Audience: individuals with a beginner-level technical background in biomedical equipment.
2. **Management Training** (2 days): High-level training for administrators and managers responsible for supporting PSA plant operations. Audience: leaders and managers responsible for making decisions concerning PSA plant budget, staffing, supervising, etc.
3. **Advanced Training** (Varies): An advanced training course can take the form of:
  - 1) Training integrated with a repair.
  - 2) Training on a specific component.
  - 3) Training of trainers (ToT).

Each type provides training on how to conduct complex maintenance, troubleshooting, and repairs on PSA plants. An advanced training will equip trainees with the knowledge and skills required to plan and supervise the maintenance of PSA plants. Audience: intermediate level technicians and biomedical engineers with existing background with PSA plants or similar equipment.

4. **Site and Electrical Assessment Trainings (2 days):** To prepare a team to conduct a comprehensive site assessment for a future PSA plant installation. The team of trainees will learn how to collect sufficient data to inform PSA plant sizing and location, as well as inform electrical upgrades required to support the PSA plant. Audience: Individuals with a basic knowledge of healthcare facilities and operations are appropriate trainees. However, it is essential that at least one person per team has a background in electrical systems and can conduct an electrical infrastructure site assessment.
5. **Repair and Electrical Assessment Training (2 days):** To prepare a team of technicians to perform assessments of existing PSA plants, with the aim of determining if the plant can or cannot be repaired. Focuses on practical skills and will be primarily conducted in the field during at least one assessment of a PSA plant. The hands-on portion of the program will be supplemented by classroom training. Audience: Technical personnel with a background in biomedical equipment, and ideally prior PSA plan experience, are appropriate trainees. However, it is essential that at least one person per team has a background in electrical systems and can conduct an electrical infrastructure site assessment.
6. **Quality and Electrical Assurance Assessment Training (2 days):** To prepare a team to conduct a comprehensive quality assurance assessment for a PSA plant installation. The team of trainees will learn how to collect information to identify issues that could impact PSA plant success by evaluating PSA components, environment, supporting equipment, and electrical connections. Audience: Technical personnel with a background in biomedical equipment, and ideally prior PSA plan experience, are appropriate trainees. However, it is essential that at least one person per team has a background in electrical systems and can conduct an electrical infrastructure site assessment.

### PSA Plant Operations

**Maintenance Plan Development:** Assist in the development of a maintenance plan for the day-to-day operations and upkeep of the plant. This plan will be developed to align with the recommendations of the plant's manufacturer and service provider. The service provider will be responsible for all primary preventative maintenance and service of the plant for the duration of the service contract.

## Phase 4: Quality Assurance and Post-Commissioning Support

- **Post-Commissioning Quality Assurance Assessment:** Visit the site to conduct an assessment, checking that the plant has been correctly installed and is performing per the specifications. This does not replace supplier commissioning inspections or other construction inspections required by local authorities.
- **Repair Assessment:** Troubleshoot the PSA plant by conducting a thorough evaluation of all PSA plant components, as well as supporting infrastructure, including the plant house structure and electrical infrastructure. BHI will provide a recommendation for future repair work needed. BHI will work within the constraints of maintenance and warranty contracts, where applicable.
- **Remote Operational Support:** Remote support for PSA plant operations, maintenance, and troubleshooting questions after the PSA plants have been installed and commissioned. This support can be elevated to in-person trouble shooting for instances of major operational challenges.
- **Service Agreement and Warranty Support:** Review and provide feedback on service agreements and warranties. BHI will assist in the development of a plan to communicate with the service provider in the event that service or a repair is needed. If applicable, BHI will also assist in the development of a plan for spare parts management.

**All technical assistance services and resources are available in English and French.**

Resources can be made available in Spanish, Swahili, Portuguese, Haitian Creole, Russian, Chichewa, or Kinyarwanda upon request.