AIR TRAFFIC AND NAVIGATION SERVICES SOC. LTD

REPUBLIC OF SOUTH AFRICA

Bapsfontein UPS Replacement

Replacement of the 3 kVA UPS

Version 1.0

August 2026

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ABBREVIATIONS

ATNS	Air Traffic and Navigation Services Company
ATC	Air Traffic Control
CD	Compact Disk
DB	Distribution Board
FAEL	East London International Airport
HMI	Human-Machine Interface
OJT	On the Job Training
PC	Personal Computer
UPS	Uninterruptible Power Supply

CHAPTER 1: GENERAL SPECIFICATIONS

GENERAL SPECIFICATIONS FOR BAPSFONTEIN UPS & ELECTRICAL WORKS

1 Project Introduction

The project calls for the removal and disposal of the existing 3 kVA UPS at the Bapsfontein receiver site with subsequent supply, delivery and installation of a new 20 kVA UPS. The project also involves works on the distribution boards as well as any relevant refurbishments and civil works at the Bapsfontein receiver site. (I)

1.1 Scope of Work

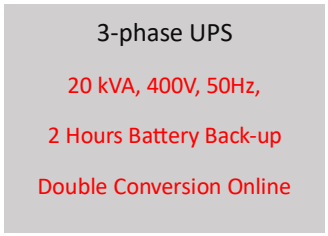

Figure 1: Summary of Requirements

Figure 1, indicates a brief summary of the requirements at the Bapsfontein receiver site.

The scope of the project is to (I):

- Decommission and dispose of the existing 3 kVA UPS in line with the ATNS processes and procedures.
- Supply, install and commission a 20 kVA UPS system, with a 2-hour battery back-up system.
- Perform all necessary and required civil and duct works.
- Establish a maintenance and support contract for the UPS system.
- Submit a Certificate of Compliance on the distribution board worked on.
- The new UPS shall at a minimum supply power to the following facilities; HF-Related Equipment, Radar SMS, Telkom and Eskom communication links and the DME/DME system.

2 GENERIC REQUIREMENTS

2.1 Environmental Conditions

[A] The offered systems shall operate within specifications under the following environmental conditions and tolerances:

Indoor Conditions	**Ambient Temperature**	-5°C to +55° C
	Relative humidity	≤ 95% for temperatures ≤ 35° C and ≤ 60% for temperatures > 35° C
Outdoor Conditions	**High and Low Temperatures**	-20°C to +60° C
	Relative humidity (Mean - Max	60% - Saturation
	Altitude	0 – 2500 m
	Average rainfall	400mm – 2000mm
	Wind speed	Up to 186 km/h

2.2 Mains Supply

[A] Data sheets for the UPS as supporting information is required. The system offered shall operate from a mains power supply as specified below:

- Single-phase: 230 VAC, Tolerance: +5% / -5%
- Three-phase: 400 VAC, Tolerance: +5% / -5%
- Frequency: 50 Hz, Tolerance: +2 Hz, -2 Hz

[B] The UPS shall be supplied with an isolator switch installed between the equipment and the mains power supply. Data sheets and specifications on the offered isolator switch is required. (D)

2.3 Cabling

[A] Power cables shall be neatly installed in cable trays and/or ducts as applicable and shall not run parallel to data cables. (D)

2.4 Transition Plan

[A] A transition plan to support the replacement of the current UPS with minimal disruption of service is required. The proposed solution design will, based on the required and proposed maintenance philosophy of the system, ensure that there is no break in the service provided. An effective transition plan is required to be in place to allow continuous supply of services during the replacement project. (D)

2.5 Software

[A] All equipment related software shall be supplied and placed under configuration control. (D)

[B] All information supplied may be copied by the Company for backup purposes and internal distribution. (D)

2.6 Equipment Installation

[A] The ATNS Project Manager reserves the right to attach ATNS Company officials to the Supplier’s installation party during installation, setting up and commissioning of the equipment for gaining practical experience (OJT) on the equipment. (I)

[B] The final parameters and settings will be recorded by the Contractor on the successful installation and will be made available to the Company as part of the As-Built document. (I)

[C] The UPS shall have a lifespan of at least 10 years. (D)

2.7 Electrical Work

The following electrical work shall be completed:

[A] The Contractor shall be responsible for disconnecting the current UPS from the DB and shall be responsible for supplying, installing and connecting power cables from the new UPS to the DB for three phase power and balancing the electrical load on all phases. (I)

[B] Details on the circuit breakers in the DBs is required that will be compatible with the installation of the new UPS. (D)

[C] The contractor shall replace the circuit breakers in the DBs which are not compatible with the new UPS. (I)

[D] The UPS batteries shall not contain any harmful substances. Supporting documentation in this regard is required. (D)

2.8 Regulations

[A] The offered system shall be compatible with at least the following acts and regulations:

- The latest issue of SABS 0142: “Code of Practice for the Wiring of Premises”.
- The Occupational Health and Safety Act, 1993 (Act 85 of 1993) as amended.
- The Local Government Ordinance 1939 (Ordinance 17 of 1939) as amended and the municipal by-laws and any special requirements of the local supply authority.
- The Fire Brigade services Act 1993 Act 99 of 1987 as amended.
- The National Building Regulations and Building Standards Act 1977 (Act 103 of 1977) as emended.
- The Electricity Act 1984 (Act 41 of 1984) as amended.
- The Regulations of the local Gas Board where applicable.

2.9 Warning Notices

[A] The Occupational Health and Safety Act 83 of 1993 shall be consulted and approval of the wording from this department obtained, prior to ordering the following notices and indicate letter colouring for all notices. These notices must be placed in the relevant places concerned with the UPS: (D)

- Unauthorised handling of equipment prohibited.
- Procedure in case of electric shock.
- Procedure in case of fire.

CHAPTER 2: SPECIFICATION FOR THE UNITERRUPTABLE POWER SUPPLY

SPECIFICATION FOR UPS

1 GENERAL – UPS

1.1 Design

The offered system shall comply with the following specifications:

[A] The UPS shall have a total rating of 20 kVA with an input voltage of 400V +- 10%, and an output voltage of 400V +- 10%, the output signal shall be of a better quality. (D)

[B] The contractor shall take full responsibility to ensure that the newly installed system shall function as required. ATNS shall not bear any responsibility for system failure or malfunction.

[C] The UPS shall be housed and fitted internally in a single cabinet, connected in series to provide nominal battery voltage. (D)

[D] The UPS shall be an online double conversion UPS to be compatible with the generator according to the international standard IEC 62040-3. (D)

[E] During Battery Mode Operation the UPS shall have a battery life of at least 2 hours. As such the UPS shall have a battery back-up time of at least 2 hours. (D)

[F] The battery bank shall compose of Lithium Iron Phosphate (LiFePO4) type batteries.

[G] Each battery shall have a nominal capacity of 2400 Wh and a nominal voltage of 48V.

[H] The battery bank should be fully charged within 3 hours after been discharged.

[I] The UPS shall operate from a 3-phase power supply. (D)

[J] The UPS shall have a graphic LCD touch screen, menu keys, direct access keys and display a power flow chart. (D)

[K] The operator panel shall be located on the front of the UPS door and shall indicate measured parameters such as UPS operating mode, battery status and alarm logs. (D)

[L] The UPS shall be a transformer-based UPS, to accommodate high currents. (D)

[M] The UPS shall have the operating modes viz. normal, bypass and battery modes. (D)

[N] The UPS shall be installed at the Main Hall of the Bapsfontein receiver site and shall have a Regulator protection switch to prevent the UPS going to bypass or shutdown during Eskom Power dips. (D)

[O] The Current Control board inside the Main Hall needs to be compatible with the installation of a UPS or be replaced with a new control board that’s capable of connecting 3 supply feeds i.e. 2 generators and Eskom. (D)

[P] The UPS shall be integrated into the GSM Commander for monitoring the status. (D)

CHAPTER 3: PROJECT MANAGEMENT

1 General

[A] The Contractor shall establish, implement and maintain extensive and comprehensive Project Management plans throughout the period of any contract arising from this bid. These plans shall be submitted to the Company for information and reporting purposes. Draft plans shall be submitted with the bid and shall be refined as necessary during the Contract development and reporting phases.

[B] The project shall be divided into management plans and activities, which can be managed, monitored, and measured in terms of duration, cost, and resources. These activities shall be organised into logical sequences. Such logical activity sequences shall be used as the main framework for planning, budgeting, controlling and reporting to the Company throughout the period of the Contract.

[C] The Contractor shall utilise an automated Project Management Scheduling tool to assist in the overall control of this project. The Company may require direct access to such Project Management Scheduling System for at least monitoring and audit purposes. Indication shall be made on the Project Management Scheduling tool they are using.

[D] Project Management shall encompass the management of all the various facets of the project as defined in the Contract. These include design, development, production and supply of all equipment and its auxiliaries. Resource allocation and management of sub-contractors. On-site installation and construction. As well as all Integrated Logistic Support activities such as testing, transitioning, commissioning and transportation movements etc.

2 Project Management Plan

[A] A detailed draft Project Management Plan (PMP) with the proposal response shall be provided. The Project Management Plan will be a formally accepted and approved document used to manage and control project executions throughout the project life-cycle phases. The PMP shall be comprehensive and detail the activities necessary to successfully complete the project.

3 Project Status Reports

[A] The Contractor shall provide at monthly intervals (or at other such mutually agreed intervals) Project Status Reports to the Company, which documents project implementation performance to date, and makes recommendations for future

implementation and changes. The project status shall be presented relative to the project schedule critical path and cost and shall also include a Risk Report. The Risk Report shall identify risks and the mitigation measures taken to either manage or avoid the risks. The Project status report shall also include the Master Project Schedule and Schedule Analysis. The Contractor shall promptly submit to the Company any Master Project Schedule which, when updated, shows a negative float or indicates a significant change to the delivery schedule. A submission of a project report template that addresses the above requirements shall be provided.

[B] The contractor shall provide project status reports at two-weekly intervals, this shall capture the project performance to date and make recommendations for future implementations and changes. (D)

[C] The contractor shall provide the acceptance of the system once commissioning has been completed. (D)

[D] The contractor shall provide as-built drawings of all systems on commissioning of the system. (D)

4 Master Project Schedule

[A] The contractor shall develop, maintain and track progress against the Master Project Schedule, which shall be organized to depict flow of work, task interdependencies and interrelationships necessary to accomplish the program objectives from contract award to completion. This Master Project Schedule shall be broken down to a sufficient level of detail and included in this bid. (D)

[B] A detailed Master Project Schedule for the entire management of the project shall be developed. (D)

[C] Project Status shall be presented relative to schedule critical path and cost and shall include a Risk Report, which will identify risks and place measures in place to manage or avoid these risks. (D)

[D] The project schedule includes all contractual specified milestones, identifies the critical path and is linked to the Work-Breakdown Structure. (D)

5 Project Review Meetings

[A] The Contractor shall attend Progress Review Meetings at monthly intervals (or at other mutually agreed intervals) to present the monthly Project Status Report to the

company. The regular Progress Review meetings shall be held at the airport premises or at the Company's Office, or any other mutually agreed locations. A copy of the written Project Status Report and meeting presentation material shall be submitted to the Company at least one week prior to the Progress Review Meeting.

[B] The Contractor shall be represented by appropriate key personnel in each significant area to be considered during the meeting to enable effective discussion of agenda items and the Progress Report. The Project Manager and relevant specialists and support personnel shall represent the Company. The Project Manager shall chair the Progress Review Meetings.

[C] The Contractor shall submit a draft Agenda for Company concurrence at least two weeks prior to a scheduled Progress Review Meeting. The Company may submit items for inclusion in the Agenda. The Contractor shall provide administrative support for the progress review and/or technical review meeting and prepare and distribute a draft record of the minutes of the meeting within one week of the meeting. The minutes are to include an Action Item List. The Company and the Contractor shall submit any updates to the Action Item List during the meeting. The Company and the Contractor prior to the next meeting shall review the draft minutes for accuracy.

[D] The Contractor and the Company will each meet their own related costs with regards to attending Progress Review Meetings.

6 Installation Management Plan

6.1 General

[A] The Contractor shall prepare an Installation Management Plan to clearly indicate the technical management of proposed methods, activities and work packages for installation, testing integrating and commissioning the UPS, while the service provided by the existing UPS continues. The Plan shall furthermore indicate how the transition from the existing installation will be achieved, leading to the commissioning and acceptance of the new UPS. A draft Installation Management Plan shall be submitted.

[B] A draft safety plan for the relevant scope of work shall be submitted. (D)

6.2 Work Breakdown Structure

[A] The Work Breakdown Structure enables the Company to maintain visibility of the project elements. A draft WBS for Bapsfontein Receiver site shall be submitted. The WBS shall identify all activities and work packages required from contract award to successful completion and commissioning of the UPS. The WBS shall be included in

the draft Construction and Installation Management Plan to be submitted as part of the proposal response.

6.3 Statement of Work (SOW)

[A] A SOW shall be provided, for each of the identified activities and/or work package which includes a detailed description of the methodology and resources required to implement and complete the work package. The Statement of Work will also be used as an input into the development of the Site Safety File. The SOW shall be included in the draft Installation Management Plan to be submitted as part of the proposal response.

6.4 Resource Allocation Plan

[A] A Resource Allocation Plan, which identifies the resources, including sub-contract resources, to be applied to each element, activity and/or work package of the project shall be submitted. The Plan shall clearly identify all project related organisational breakdowns, responsibilities and work proposed. The Resource Allocation Plan shall be included in the draft Installation Management Plan to be submitted as part of the proposal response.

6.5 Resumes of Key Personnel

[A] The Contractor shall ensure that only appropriately qualified and experienced personnel will be employed on the tasks and/or work packages identified. The Company shall retain the right to direct the Contractor to remove from the project any personnel considered by the Company to be inappropriately qualified or experienced, or unacceptable to the Company. The response shall include as part of the resource allocation the resumes of key personnel to be dedicated to the project.

6.6 Technical Reviews and Meetings

[A] The Contractor shall be required to conduct technical reviews and meetings with Company personnel either at the Company Headquarters or on-site at the airport. It is preferred that these reviews be held concurrently with Progress Review Meetings, where possible. The below requirements are representative requirements, certain alternative plans may or may not be offered. These plans must list and describe the Technical Reviews and Meetings they would propose for this project. The technical reviews and meetings should consist of at least a Site Survey and Acceptance Test Readiness Review. (I)

6.7 Installation and Construction Specification

[A] A draft installation and construction specification shall be submitted. The specification shall indicate the comprehension of the scope of work required.

7 Testing & Commissioning

7.1 Test and Evaluation Master Plan

[A] The Contractor shall prepare, implement and maintain a Test and Evaluation Master Plan (TEMP) that describes the plan for all Tests and Evaluations to be undertaken in demonstrating compliance with the technical, operational, contractual and performance requirements of the project. This plan shall include an Acceptance Matrix, which identifies all deliverables, and methods of testing proposed, to demonstrate compliance. A draft Test and Evaluation Master Plan shall be submitted with the bid.

7.2 Acceptance and Commissioning Tests

[B] Specific testing and evaluation procedures for the Acceptance Tests (e.g. Physical Inspections, Final Site Acceptance Tests etc.) shall be defined and detailed in the Test and Evaluation plan for each project deliverable. Indication shall be made of the type of test equipment required for each test described and shall be clearly documented.

8 Risk Management Plan

8.1 Risk Policy and Procedures

[A] The proposal response has an outline of their risk policy and methodology for risk identification, assessment and abatement for all equipment and services to be supplied shall be submitted under this project.

8.2 Risk Abatement

[A] The Contractor shall provide, during the execution of the contract, information which identifies risk, the estimated level of risk, the consequences of failure, and risk reduction strategies relevant to:

- Construction and Installation objectives;
- Equipment and cables; and
- Construction and Installation schedules.

8.3 Risk Report

[A] The Contractor shall provide a Risk Report at each Progress Review Meeting to indicate the status and action regarding identified risk items. The format of the Risk Report shall be mutually agreed.

8.4 Delivery of Project Risk Management Plan

[A] A detailed Project Risk Management Plan after contract award and completion of the site survey, before implementation shall be submitted.

9 Quality assurance

9.1 QA Policy and Procedures

[A] The Contractor shall include in their details, the company quality assurance policy and procedures and relevant accreditations held by the company.

9.2 Responsibility for Quality

[A] The Contractor shall be responsible for ensuring that the quality of equipment and installation materials are supplied in accordance with the terms of the Contract, and any construction and installation activity performed, fully conforms to the prescribed requirements. The Company will undertake a monitoring and audit role in relation to the Quality Plan and program to determine whether equipment, construction and installation deliverables meet the contractual requirements.

9.3 Audit Reports

[A] The Contractor shall prepare monthly Audit Reports in respect of the project as part of his internal QA procedures and provide details of any corrective actions taken. Audit Reports shall be submitted for evaluation by the Company during Project Progress Review Meetings.

9.4 Company Quality Inspections

[A] The Company reserves the right to perform inspections, conduct tests or perform audits at the Contractor’s or sub-contractors’ premises at any time when such actions are deemed necessary to ensure supplies and services conform to the specified requirements.

9.5 Delivery of Project QA Plan

[A] A detailed Project Quality Assurance Plan after contract award and completion of the site survey shall be submitted.

10 Occupational Health and Safety Plan

10.1 Safety File

[A] A Safety File shall be submitted as per the Occupational Health and Safety Act No. 85 of 1993, SABS 0142-1981 requirements for approval by ATNS before any construction

work may commence at the site. The draft Safety File to be submitted shall address the minimum requirements of the Occupational Health and Safety Act No. 85 of 1993 as listed below. After contract award, the detailed Safety File shall be further developed by the successful Contractor.

Table: Minimum Requirements for a Draft Safety File

No	Item	Included in Draft SHE File	Comments
1.	Health and Safety Policy (signed)	Yes	
2.	Department of Labour - Valid Letter of Good Standing. (COID)	Yes	
3.	Public Liability Insurance Certificates (Valid)	Yes	
4.	Scope of Work including the Company Organogram, resource allocation and individual OHS responsibilities	Yes	Based on proposal offered
5.	Method Statements	Yes	Based on proposal offered
6.	Notification of Construction Work (Where Applicable)	Yes	Completed form and signed for transmission to DoL after contract award and completion of SHE File
7.	OHS 37(2) Mandatory Form • Agreement between ATNS and Contractor	Yes	Completed form where possible. Agreements will be included after contract award and completion of SHE File

No	Item	Included in Draft SHE File	Comments
8.	Mandatory Agreements – Between Principal Contractor and Sub-Contractors	Yes	Signed agreement, if any
4..	**Legal Letters of Appointments** 16.1 – CEO CR 8.5 – Construction Health and Safety Officer CR 8.1 - Construction Manager CR 8.7 - Construction Supervisor CR 9(1) - Risk Assessor GAR 9(2) - Incident Investigator CR 13.1(a) - Excavations Supervisor CR 23 - Construction Vehicle/Mobile Plant Supervisor All other Legal Appointees as applicable	Yes	All appointment letters must be duly singed.
5	Competency Certificates for all Legal Appointees.	Yes	Valid certificates for all Appointees included

No	Item	Included in Draft SHE File	Comments
6	ATNS OHS Specifications	No	ATNS Specifications to be provided after contract award for completion of SHE File
7	Health and Safety Plan	Yes	In draft format and must be based on work to be undertaken and in relation to the proposal offered
8	Risk Assessment	No	To be developed in conjunction with ATNS after contract award and during completion of the SHE File
9	Baseline Risk Assessment + Risk Matrix	No	To be developed in conjunction with ATNS after contract award and during completion of the SHE File
10	Medical proof of all Contractor employee's physical and psychological fitness to work **ON SITE** at the individual airports listed	No	Valid medical certificates will be submitted after contract award for inclusion in the SHE File
11	**Check Sheets and Registers** Personal Protection Equipment Powered Mobile Plant Public Safety	Yes	

No	Item	Included in Draft SHE File	Comments
	Site Establishment Trenching and excavation Backfilling and compaction Firefighting Inspection First Aid Box and Equipment Hand Tools Hygiene Facilities Daily Plant Environmental		
12	Incident Investigation and Reporting Procedures	Yes	Comprehensive Procedures and all forms for reporting
13	Toolbox talks	Yes	List of subject matters applicable and record keeping thereof
14	Emergency Plan	No	To be developed after contract award for inclusion in the SHE File
15	Waste Management Plan	Yes	Detailed Waste Management Plan

11 Site Survey

11.1 Requirements

[A] A comprehensive site survey of the civil works, for the Bapsfontein receiver site shall be provided. The site surveys shall be completed at the beginning of the project

activities and at least before any equipment is ordered. The site survey shall include but not be limited to: (I)

- Detail investigation of the status of the current UPS's electrical connections including remote monitoring interfaces;
- Identification of the cable routing;
- Actual measurements of route lengths;
- Detail inspection of the available space on existing cable trays; and
- Photographs of all aspects identified.

[B] A draft detailed site survey and use of the information gathered to update planning, design, installation and implementation specifications shall be submitted.

12 Environmental Management Programme

[A] The Contractor shall develop an Environmental Management Programme (EMPr) based on identified activities which may have potential or actual environmental impacts before the commencement of work in accordance to the National Environmental Management Act (No. 107 of 1998) and the relevant environmental legislation as well as ATNS' environmental specifications. The bidder shall submit a draft environmental management programme with their submission of this bid. (D).

[B] A Draft Environmental Management Programme (EMPr) shall be provided, specific to the project scope. The environmental management programme shall address, without limitations, the following: (D)

- Energy efficiency pertaining to all aspects of the project;
- The use of Environmentally sustainable materials and products;
- Biodiversity management i.e. soil erosion, clearance of vegetation, rehabilitation of the site, all flora and fauna protection;
- Waste and water management;
- Air quality management i.e. dust suppression; and
- Visual and aural impacts.

[C] A suitably qualified environmental officer or service provider shall render the services required as per EMPr activities relevant to this project. (D)

CHAPTER 4: LOGISTICS & MAINTENANCE

LOGISTICS & MAINTENANCE

1 Warranty

[A] The UPS shall have a minimum 1-year warranty. The warranty shall cover labour, material and equipment that shall arise from this bid without exclusions. A proposed warranty terms and conditions that aligns to this requirement shall be submitted. (D)

[B] Routine maintenance for the UPS during the one-year warranty period shall be described.

[C] The warranty shall cover all system malfunctions such that it maintains the system to its initial commissioning status. (D)

2 Operational Training

[A] Operational training shall be provided to three technical staff, on the use of these systems at commissioning, to monitor system status and contact the contractor when major faults occur. A draft training plan shall be submitted. (D)

[B] The bidder shall submit the operational manual list with this bid (D)

3 Maintenance Contract

[A] A detailed maintenance contract shall be provided, clearly indicating all required maintenance activities such as preventative and corrective maintenance per annum as well as, all labour and spare parts costs for a period of 5 years. Which includes a one-year warranty and four-year support and maintenance.

[B] The maintenance contract shall be for a period of four years and commences after the one-year warranty for the UPS. The bidder shall include as part of the bid the technical and pricing schedule for the 4-years support and maintenance for the UPS.

[C] The contractor shall therefore be responsible to keep the system fully operational for a total duration of 5 years. The bidder shall include as part of the bid the technical and pricing schedule for the 4-years support and maintenance for the UPS.

[D] A detailed maintenance contract, clearly indicating all required maintenance activities such as preventative and corrective maintenance per annum as well as all labour and spare parts costs shall be submitted. ATNS does not expect to incur additional costs over the maintenance contract duration. The maintenance terms and conditions shall clearly stated. (D)

[E] The maintenance contract shall be for a period of 4 years and commences after the 1-year warranty for the UPS. (D)

[F] The contractor shall therefore be responsible to keep the system fully operational for a total duration of 5 years. The technical and pricing schedule for the 4-years support and maintenance for the UPS, shall be submitted.

4 Service-Level Agreement

[A] Should the system or any of its components malfunction the contractor shall return the system to full operation within 24 hours. This also applies to the warranty and maintenance contract. (D)

[B] The contractor shall submit installation As-builts and Certificates of Compliance after successful commission of the UPS and rewiring of the distribution boards. (D)