


File Ref:	EC Protection Service – Standard Specifications	
Approve Date: 20/06/2022	Specification and Schedule of quantities	
Title:	Supply and Delivery of Two-way Radio System	


ANNEXURE B DETAILED SPECIFICATION FOR ITEM NUMBER 4 ON THE PRICING SCHEDULE

PROJECT SPECIFICATION AND SCHEDULE OF QUANTITIES

FOR

EC PROTECTION SERVICE:

Supply and Delivery of Radio system

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END-USER DETAILED RADIO SPECIFICATIONS

1. BACKGROUND

Reliable and secure communication is an essential component that must be present in the rail system and is necessitated by railway safety regulations.

Radio communication is essential to PRASA Rail's everyday operations since it enables personnel in the engineering, maintenance, operations, safety, and customer service sectors to remain in communication with one another whilst working.


Radios have historically been an effective trustworthy form of communication in the PRASA Rail environment. To provide secure and reliable communication throughout the PRASA's expansive environment, these tools are essential.

The Eastern Cape Protection Service Department currently relies solely on their own cell phones to make calls and send messages to WhatsApp groups as their primary means of communication. Due to this, emergency reaction times and dispatching are incredibly slow and inefficient.

2. SPECIAL CONDITIONS

1. SCOPE OF WORK

This contract covers the provision and delivery of radio handsets in accordance with the terms of the tender document (hereinafter referred to as the "Works"), as well as any additional work that arises from, is related to, or is required for the completion of the previously stated by the Contractor in accordance with the true meaning and intent of the contract.

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2. BUSINESS NAME

PRASA RAIL a DIVISION OF PASSENGER RAIL AGENCY OF SOUTH AFRICA (PRASA) will for the purpose of this Contract be trading and hereinafter be referred to as PRASA RAIL.

3. COMPLETION OF WORK

PRASA Rail requires the Works to be completed in 180 calendar days, including any statutory holidays falling within such period. The completion date shall be determined by adding the time frame mentioned above to the later of the dates specified in the notice of acceptance of the tender or the notice of acceptance of tender, as applicable.

4. PENALTIES FOR LATE COMPLETION

Should the Contractor fail to complete the Works by the date stipulated in the contract, or such extended date as may be allowed by PRASA Rail, he shall pay to PRASA Rail as penalties in terms of the Conventional Penalties Act, 1962 as amended, the amount of R 680.92 for each day or part thereof during which the Works remains incomplete.


5. PLANT AND MATERIAL TO BE SUPPLIED BY PRASA RAIL

Unless otherwise specified, the provision by the Contractor of all personnel, materials, transportation, plant, equipment, consumables, tools, and services of every type required to execute and conclude the works described in this Contract and any subsequent work shall be the obligation of the Contractor.

The Contractor agrees to become acquainted with the necessary information specified in this Agreement.

In accordance with the aforementioned, any materials that the contractor might appropriately anticipate to utilize need to be accessible to him or her.

All materials and labor must be used in compliance with the instructions provided by the manufacturer and with the project manager's or technical officer's approval.

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No second-hand materials must be used.

6. ADVANCE PAYMENT FOR MATERIAL AND/OR PLANT AND/OR EQUIPMENT SUPPLIED BY THE CONTRACTOR

No advance payment for material and/or plant and/or equipment supplied by the Contractor for the purpose of incorporation/installation as part of the Works will be made by PRASA Rail.

7. CONTRACT PRICE ADJUSTMENT FACTOR AND PAYMENTS

The Contractor shall, due to the relatively short contract period allow for any increase or decrease in costs in his rates tendered for the Works as this contract will not be subject to escalation. The Technical Officer/Project Manager may, at the request of the Contractor, make a progress measurement of the work done, including any duly authorized alteration, extra, addition or omission.

Payments shall only be made for items and network utilized.

8. PROVISION OF GUARANTEE OF MATERIAL AND EQUIPMENT SUPPLIED AND DELIVERED


The Contractor must provide certified and supporting documents indicating that the material and equipment supplied are guaranteed for **at least one year (12 months)** from the date the material and equipment are delivered and approved by PRASA Rail. This guarantee will be free of charge.

This means that the material and equipment purchased and delivered to PRASA Rail should be guaranteed for a minimum of one year.

9. INSURANCE AGAINST PERILS INSURABLE THROUGH SASRIA

Insurance of the Works against damage caused because of perils insurable through SASRIA will not be affected by PRASA Rail.

10. DISCREPANCIES IN DOCUMENTS

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In the event of any discrepancy or inconsistency between the Project Specifications and any other specification or drawings, the Project Specifications shall prevail.

3. END-USER SPECIFICATION AND REQUIREMENTS

PORTABLE RADIO

The radio must be able to handle the demanding communications needs of a sizable company like PRASA Rail.

It must meet all end-user criteria for compliance, programming, and compatibility. It must be a digital portable radio with up to four configurations that can be selected, two of which must contain Talk group and traditional signaling.

To improve management effectiveness and enable quick reaction to emergency circumstances, the digital radio must have an ergonomic design, all-digital features, and exceptional quality.

It must have a sizable color display that enables for clear sight even in very bright conditions. The antenna's design must guarantee easy use and superior GPS performance.

Even in challenging conditions, the radio must provide excellent performance.


It will be able to guarantee you a superior voice in crowded locations and/or at the edge of the service area by combining the use of narrowband codec and digital error-correction technology. Voice quality can be enhanced by using AGC technology. Additionally, it must include a speaker that produces at least 1W of power for crystal-clear audio connection.

There is a demand for a powerful, long-lasting battery.

It will have a "Dual-slot" capability that allows a member who needs to communicate to use the open slot. This function will increase frequency efficiency and let you talk swiftly in an emergency.

The portable trunk radio will have safe communication thanks to intrinsic encryption of the digital technology, where encryption capability is strengthened (i.e., 256-bit encryption).

It must offer a wide range of services, including feature-rich data services, text messaging, scanning, emergency alerts, man down notifications, vibration auto registration, high-speed data transmission, GPS tracking, lone worker alerts, and panic buttons, in addition to traditional communication services.

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It must have a side port set aside so that users or any other partners can create more beneficial programs to increase the functionality of the radio.

The portable radio must enable option board interfaces, enabling third-party developers to create a variety of programs that connect to radios, control radios, and increase their functionality. Voice recording, encryption, and other functions shall be among those supported.

Main Functions of Digital Portable Radio:


Digital and analogue modes must be switchable on the portable radio. It must be compatible with the widely used analogue system in order to enable a smooth transition from analogue to digital.

It must have a flexible voice call feature that supports various voice call types, including Private Calls, Group Calls, All Calls, and Emergency Calls, using the portable radio's clever signalling.

The mobile radio must support One Touch functions including phone calls, text messages, and extra services. Additionally, it will be able to scan pure analogue and pure digital.

1. Portable Radio Features Summary required:

- Up to 1024 channels
- 2G: 200kHz; 3G: 5Mhz selectable channel spacing
- Mixed mode scanning (analogue & digital channel)
- Ensure outstanding performance in harsh environments
- Supporting Global Positioning System (GPS)
- Digital voice call function
- Digital text message function (reprogrammable message and editable message)
- Supplemental services (remote monitor, radio enable, radio disable, call alert)
- Man Down (factory optional)
- Lone worker
- Basic Scrambler and Encryption
- Advanced Encryption optional
- Multi-Site Roaming (optional)
- Supporting Option Board Interface
- Channel Change Voice Notification
- 5-tone, HDC1200, 2-tone signaling selectable (in analogue mode)
- Analogue & Digital DTMF
- One-touch call/text message/supplemental services
- Telemetry

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- Home screen dial
- Multi-language menu display
- Vibration
- Power on & off user logo programming
- Analogue & Digital Emergency
- Panick Button

2. Items which must be included:


- Radio x 1
- Li-ion Battery (4000mAh / 5200mAh) x 2
- MCU Rapid Rate Single Unit Charger x 1
- Switching Power Adapter x 1
- Standard Antenna x 1
- Leather Strap x 1
- Belt Clip x 1
- User Manual x 1

The portable radio shall have availability to a variety of accessory options such as Audio accessories, batteries, chargers, carry options and much more. This provides the option to PRASA Rail if and when such accessories are required.

The radio shall comply at least to the ETSI EN 300 113 Standard: Electromagnetic compatibility and Radio spectrum Matters (ERM); Land Mobile Service, Radio equipment intended for the transmission of data (and/or speech) using constant or non-constant envelope modulation and having an antenna connector and shall conform to Electromagnetic Compatibility Directive 89/336/EEC. The radio shall comply with all applicable regulatory standards and requirements.

KEY FEATURES & BENEFITS


- Global PTT Service
Users can use PTT services globally via public operator existing mature 2G/3G/4G network.
- 3G/4G/GSM (GPRS) /Wi-FiTransmission
- NFC (optional) / Bluetooth
- GPS
Remote programming over the air via public radio network enables lower customer maintenance cost.

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- User modification settings through web-based management application in smart phones
Remain user operation habits of critical communication.
Professional functions, such as voice services (all call/group call/ private call / alert calls); Text messages; Tone alert (incoming call/outgoing call/ text message/ talk permit /low batter/emergency panic.
- Advance signalling service.
- Kill /stun/ revive to enable flexible management.
- Software application includes monitoring/recording and a unique guard patrolling system.
- IP54 Protection Design


RADIO SPECIFICATION

GENERAL	
Communication Systems & Frequency Bands (optional)	Version1 (EMEA & ASIA): FDD-LTE: Band 1,3,5,7,8,20. TDD - LTE: Band 38,40,41. Wcdma: Band 1,2,5,8 GSM/ GPRS: Band 2,3,5,8. Wi-Fi: 2.4/GHz
Channel Spacing	2G: 200kHz 3G: 5Mhz
Operating Temperature	-20°C ~ + 50°C
Storage Temperature	-40°C ~ + 80°C
Operating Supply	DC 3.7V
Battery	4000mAh (Standard); 5200mAh (High Capacity) (lithium-ion battery)
Dimension (H*W*D) (with battery, without antenna)	115mm*54mm*30mm
Weight (with battery and antenna)	330g
Display	160 × 128 pixels, 65,536 colours, 1.8 inches, 4 rows
IP Rating	IP54

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TRANSMITTER	
RF Power Output	2G: 2W ± 0.5W/3G: 0.25W ± 0.1W
Frequency Stability	± 0.5 PPM
Audio Distortion	5% (typical)
RECEIVER	
Frequency Stability	± 0.5 ppm
Sensitivity	2G: BER <0.001 when Ior = 1µV; 3G: BER <0.001 when Ior = 1µV
Rated Audio Power	1W
Rated Audio Distortion	5% (typical)

4. FINANCIAL IMPLICATION

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EQUIPMENT	QTY	Unit of Measure	ESTIMATED UNIT COST	ESTIMATED TOTAL COST
Clocking Radio	45	(Once-off)	R254.15	R11,436.75
Radio (All Stations, Infra and Mobile)	199	(Once-off)	R679.15	R135,150.85
Base Radio (Control Rooms, Staging Yards, TMC, RM&TCC, Vehicles)	46	(Once-off)	R1,020.00	R46,920.00
Battery	163	(Once-off)	R509.15	R82,991.45
Clocking Points – devices	150	(Once-off)	R764.15	R114,622.50
Commissioning and programing	50	(Once-off)	R560.15	R28,007.50
Mobile Installation	150	(Once-off)	R297.50	R44,625.00
Total Cost				R463,754.05
Communication	QTY	Unit of Measure	ESTIMATED UNIT COST	ESTIMATED TOTAL COST
APN (Access Point Name) - Backhaul Connectivity	12	Monthly	R424.15	R61,077.60
Software and SIM	163	Monthly	R127.50	R249,390.00
Server – Cloud storage 1TB - Managed (record management)	12	Monthly	R200.60	R28,886.40
Roaming Bics Sims (all radios including PTT)	209	Monthly	R272.00	R682,176.00
NFC Guard Patrols	50	Monthly	R211.65	R126,990.00
Managed Services – Cyber Security Operations Center (SOC) 24x7x365	209	Monthly	R312.80	R784,502.40
Total Cost				R1,933,022.40
Protection Services	QTY	Unit of Measure	UNIT COST	TOTAL COST
Guards (Integration for monitoring)	20	Monthly	R127.50	R30,600.00
Training	20	Monthly	R170.00	R40,800.00
Controller (24hrs)/Intergrated system with Client controllers	2	Monthly	R297.50	R7,140.00
Total Cost				R78,540.00
			SUB-TOTAL	R2,475,316.45
			VAT	R371,297.47
First Month Cost			TOTAL	R2,846,613.92
			SUB-TOTAL	R2,011,562.40
			VAT	R301,734.36
Monthly Cost			TOTAL	R2,313,296.76