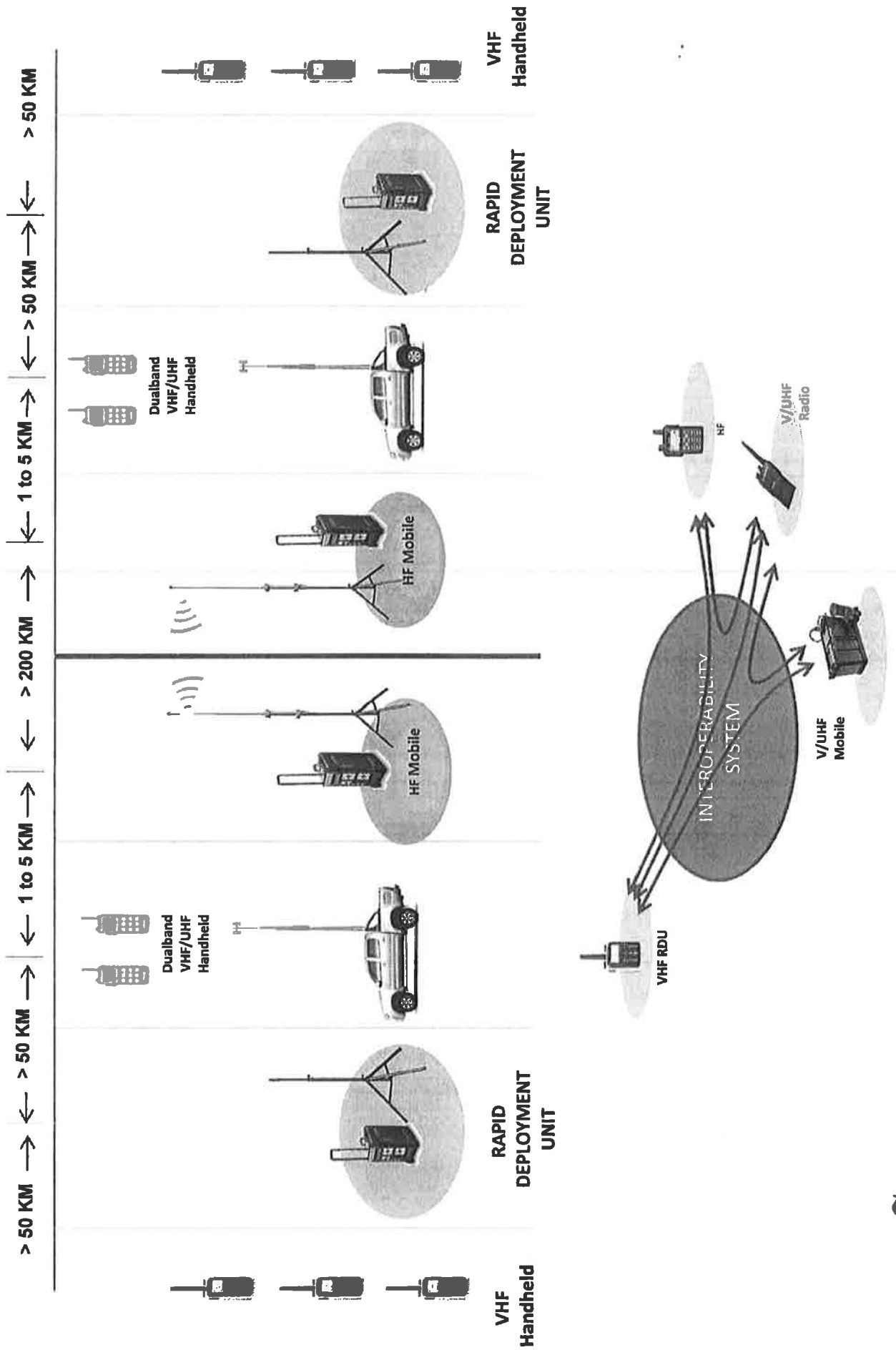


**APPENDIX 1: ILLUSTRATION OF THE COMMUNICATION SYSTEM WITH HF FOR LONG DISTANCE COMMUNICATION**



**TO REQUEST FOR QUOTATION  
TO  
SUPPLY, INSTALL AND TESTING  
RADID DEPLOYMENT UNIT (RDU) HF TO V/UHF CROSSBAND SYSTEM**

**BRIEF EXPLANATION**

1. The Rapid Deployment Unit (RDU) HF TO V/UHF CROSSBAND Radio Communication System must be ideal for quick response and deployment during disaster.
2. The frequencies to be used for this system are:

**HF: Between 3 MHz to 30 MHz**
3. The system will be deployed throughout the country for use during disaster, search and rescue operation and major events.
4. The system can be transported to targeted location using any means of transportation available (vehicle, boat, helicopter etc)
5. The system will be capable of:
  - a) Two way voice communications (point to point and point to multipoint);
  - b) Operate from multiple power options, i.e. battery, generator, solar etc;
  - c) To cross connect between HF to U/VHF donor radio; and
  - d) HF radio to be Software Define Radio (SDR) and IP capable.
6. The system besides user friendly must be easily set-up and launched.
7. The system must be scalable and interoperable for future expansion.
8. The successful bidder is to deliver the system within 30 days after the date of award, and it is expected that the system to package together with necessary training on the equipments.
9. The successful bidder, prior to the installation of the system, must provide appropriate testing, commissioning and warranty for at least one year.
10. In the quotation, please state the following:
  - a) Detailed description of the system including, features, advantages and disadvantages;
  - b) The timeline for the complete system to be delivered and commissioned.

## DETAILED EQUIPMENT SPECIFICATIONS

HF to U/VHF Crossband Radio Communication package must comprise of:

### 1. HF Radio Transceiver

a	Frequency coverage	Transmit: 1.6 to 30 MHz Receive: 250 kHz to 30 MHz
b	No. of preset channels	At least 500 channels, simplex or semi-duplex
c	Scanning	Up to 20 scan groups Simultaneous scanning for Selcall (ALE/CCIR)
d	SDR architecture	DSP, 456 MHz, 32-bit
e	Modes	AM/USB/LSB/CW/FM/FSK/AFSK
f	Selective Calling	Selcall CCIR-493-4
g	Power Output	At least 100 watts
h	Duty cycle	100 % (voice and data)
i	Operating voltage	10.8V to 13.8V (12V nominal)
j	IP	Must be IP ready

### 2. VHF or UHF Radio

This unit is not required in this RFP, but the system must be able to interconnect with the existing MCMC's VHF or UHF radio.

### 3. HF to U/VHF Crossband Unit

The crossband unit allows for interoperability between HF radio users and the U/VHF radio users to talk through in real-time.

VHF/UHF Tx signal level	10 mV p-p to 3 V p-p, nominal
VHF/UHF Rx signal level	10 mV p-p to 3 V p-p, nominal 600 $\Omega$ output impedance (selectable) Balanced/unbalanced audio (selectable)
VHF/UHF Rx signal level	10 mV p-p to 3 V p-p, nominal 600 $\Omega$ output impedance (selectable) Balanced/unbalanced audio (selectable)
Operating voltage	9 to 16 V DC
Power consumption	Less than 100 mA (13.8 V supply)
Environment: Ambient temperature Relative humidity	Less than 100 mA (13.8 V supply) 95% non-condensing

#### 4. Power Supply

- a) Battery system that allows for at least 4 hours of continuous operations before re-charging is required; and
- b) Generator of at least 1 KVA.

#### 5. Antenna

Antenna 1 (for mobile operations)	Frequency coverage 3 MHz to 30 MHz
	Must be permanently installed on vehicle
	Must be auto-tunable following the frequency selected on the radio, tune time not to exceed 3 seconds.
	Capable of handling 100 watts of power
	Capable of NVIS operations with certified guarantee from manufacturer to be able to operate from zero to at least 1000 km, without any skip zones.
	Capable of providing communications coverage on the move.

Antenna 2 (for portable operations)	Frequency coverage 3 MHz to 30 MHz
	Must be tunable horizontal dipole antenna, tune time not to exceed 3 seconds.
	Must be auto-tunable following the frequency selected on the radio
	Capable of handling 100 watts of power
	To provide with at least 7 metre high of portable mast or tower.

#### 6. Transportable housing

The above system with the exception of the antennas and the batteries, are to be integrated and housed in an air-transportable casing that is shock-proof, weather-proof and water-proof.