Multi Band DVRS Radio Specifications

Article	Specifications	Compliance		Reference in Technical Bid	Bidder's Comments
		YES	NO		
3 General Mandatory Criteria					
3.4	*Offerors must propose repeater systems that meet all requirements of Section 12 of this Statement of Requirement and Offerors must propose compatible radio equipment capable of multi-band operations* ***in all*** *3 bands as identified in Section 8 of this NMSO.*				
4 Interpretation and Scope					
4.2	*Scope*				
4.2.1	*The Offeror must supply Radio Equipment that is compatible with the P25 Standard*				
4.2.2	*The Offeror must supply the P25 Radio Equipment as specified in this Statement of Requirement (SOR) on an "as and when requested" basis in accordance with the quantities described in Call-ups; and*				
4.2.2.3	*For multi-band Radio equipment, the Offeror must supply radio equipment capable of multi-band operation in all 3 bands as identified in Section 8 of this SOR.*				
4.2.3	*Single, Dual and Multi-band radio equipment must conform to band specific requirements for each supported band(s) as defined in Section 8 of this SOR*				
4.2.4	*For P25 Digital Vehicular Repeater Systems, the Offeror must supply repeater systems that meet all requirements of Section 12 of this Statement of Requirement and Offerors must Supply compatible radio equipment capable of multi-band operations in all 3 bands as identified in Section 8 of this NMSO*				
6 Mandatory General Equipment Specifications					
6.1	*Codes*				
6.1.1	*Alternating Current (AC) powered equipment must be certified by the Canadian Standards Association (CSA), Underwriters Laboratories Canada (ULC) or Canada European Testing Laboratories (CETL).*				
6.1.2	*Radio equipment requiring a technical acceptance certificate as per Section 4(2) of the Canadian Radiocommunication Act must comply with RSS-Gen, RSS-119, RSS-102, and applicable parts of CS-03.*				
6.1.3	*Radio equipment must have an Innovation, Science and Economic Development Canada Radio Compliance certificate as of the date of RFSO solicitation period closure.*				

Multi Band DVRS Radio Specifications

Article	Specifications	Compliance		Reference in Technical Bid	Bidder's Comments
		YES	NO		
6.1.4	*Offeror must provide a list of certificates issued by Innovation, Science and Economic Development Canada for the proposed radio equipment.*				
6.2	*Standards*				
6.2.1	*Radio equipment must be based on APCO Project 25 standards as defined by the TIA-102 series of documents.*				
6.2.2	*Unless otherwise stated, all references made to the suite of TIA-102 documents refer to the most current published version, including addendums that have been signed-off by the P25 steering committee as of 6 months prior to the date of RFSO solicitation period closure.*				
6.2.3	*Internet Protocol (IP) and related protocols must conform to Internet Engineering Task Force (IETF) standards.*				
6.2.4	*The Offeror must meet or exceed the Mandatory Technical Specifications for radio equipment during the period of this Standing Offer or Contract that extends beyond the period of the Standing Offer. If the Offeror has proposed the manufacturer's standards in its Offer, and the manufacturer reduces its standards below those of the Mandatory Technical Requirements, the Mandatory Technical Requirements shall thereafter be deemed to automatically apply.*				
6.2.5	*Radio equipment using Bluetooth accessories must meet or exceed the Bluetooth 4.0 standard.*				
6.3	*Architecture*				
6.3.1	*Offeror must describe how the radio equipment design architecture facilitates:* *a) Software/ Firmware updates and enhancements; and* *b) Integration with 3rd party software, equipment and accessories.*				
6.4	*Conformance to Industry Standard Specifications*				
6.4.1	*Offeror must describe the process they employ to ensure that their radio equipment conforms to applicable Industry Standards and interoperates with competitive vendors' radio equipment.*				
6.4.2	*Offeror must describe the process they use to resolve any disputes surrounding interpretation of Industry Standards.*				
6.4.3	*Offeror must provide a list of third party radio systems which have been proven to be compatible with their radio equipment. A test report must be included that validates any Offeror compatibility claims.*				

Multi Band DVRS Radio Specifications

Article	Specifications	Compliance		Reference in Technical Bid	Bidder's Comments
		YES	NO		
6.5	*Security*				
6.5.1	*Offeror must describe how their radio equipment security architecture is designed and implemented to prevent:* *a) Unauthorized access to equipment configuration;* *b) Unauthorized access to encryption information;* *c) System disruption through improper or unauthorized use, or equipment failure; and* *d) Unauthorized reprogramming of disabled equipment.* *e) Unauthorized radio cloning*				
6.5.2	*Radio equipment must be protected from unauthorized access to radio programming information.*				
6.5.3	*Radio equipment must be protected from unauthorized reprogramming of inhibited radio equipment.*				
6.6	*Design Life*				
6.6.1	*Radio equipment must not be:* *a) Manufacturer discontinued; or* *b) Subject to any notice or advisory from the manufacturer that it will be discontinued within 3 years of this RFSO solicitation period closing date.*				
6.6.2	*Offeror must provide a written manufacturer statement for all proposed radio equipment, confirming that the radio equipment is: neither manufacturer discontinued nor is there intent to discontinue the radio equipment within 3 years of this RFSO solicitation period closing date.*				
6.6.3	*Radio equipment excluding accessories and batteries must have a minimum Useful Lifespan of 10 years.*				
6.6.4	*Offeror must provide an extended warranty option to cover the minimum Useful Lifespan of 10 years.*				
6.6.5	*Offeror must describe:* *a) Expected Useful lifespan of radio equipment; and* *b) Expected manufacturer duration of service and support of radio equipment.*				
6.6.6	*Offeror must provide a product roadmap for all radio equipment proposed.*				
6.7	*Quality*				

Multi Band DVRS Radio Specifications

Article	Specifications	Compliance		Reference in Technical Bid	Bidder's Comments
		YES	NO		
6.7.1	*Offeror must be ISO 9001:2015 certified prior to and during all periods of manufacturing of radio equipment.*				
6.7.1.2	*Offeror must describe the standards followed during design and manufacturing of radio equipment*				
6.7.2	*Offeror must describe their quality assurance process used to ensure that radio equipment operates and functions as intended.*				
6.7.3	*Offeror must describe their process and typical timeframes to resolve product defects identified by the Technical Authority when:* *a) Radio equipment is under warranty (Standard or Extended); and* *b) Radio equipment is outside the warranty period.*				
6.7.4	*Offeror must describe the process and timelines used to notify the Technical Authority of product defects identified by other users or by the Offeror.*				
6.7.5	*Radio equipment must be commercially available prior to this RFSO solicitation period closing date.*				
6.7.6	*Single Band radio equipment must be used in a production environment in at least two other P25 public-safety systems of 2000+ devices within North America as of the date of RFSO solicitation period closure. Offeror must provide references complete with contact information for such system.*				
6.7.10	*Offeror must provide a list of public safety customers, complete with contact information, within North America who have deployed the Offeror's radio equipment in their operational live radio system(s).*				
6.8 Licences					
6.8.1	*Software, product usage, features, capacity licences and/or activation keys must be transferrable to replacement radio equipment of the same model or equivalent functionality provided with replacement radio equipment of the same model, without cost to the Authorized User, in the event of radio equipment damage or loss for the minimum Useful Lifespan.*				
6.9 Identification					
6.9.1	*Radio equipment serial numbers must be machine-readable using barcode.*				

Multi Band DVRS Radio Specifications

Article	Specifications	Compliance		Reference in Technical Bid	Bidder's Comments
		YES	NO		
6.9.2	*Offeror must describe the method used to permit machine reading of radio equipment serial numbers.*				
7 Mandatory Equipment Specifications					
7.1	*Regulatory Band Requirement*				
7.1.1	*Radio equipment must fully conform to regulatory band requirements for each supported band(s) as defined in the corresponding Band Specific Requirements Section of this document. (Section 8)*				
7.2	*P25 Phase 1 Air Interface*				
7.2.1	*Radio equipment must support an Air Interface which fully conforms to TIA-102.BAAA-B, FDMA – Common Air interface.*				
7.2.2	*Radio equipment must support an Air Interface which fully conforms to TIA-102.BAAC-D, Common Air Interface Reserved Values.*				
7.2.3	*Radio equipment must utilize a vocoder which fully conforms to TIA-102.BABA-A, Vocoder Description.*				
7.2.4	*Offeror must specify the version of vocoder used in the radio equipment.*				
7.2.5	*Supplier Declaration of Conformance (SDoC) and Summary Test Reports showing compliance with Sections 2.2.1, 3, and 4 of US Department of Homeland Security Project 25 Compliance Assessment Bulletin, Baseline Common Air Interface Testing Requirements (P25-CAB-CAI_Test_Req July 2017) must be provided for the radio equipment.*				
7.3	*P25 Phase 2 Air Interface*				
7.3.1	*Radio Equipment must support P25 Phase 2 Trunking operations.*				
7.3.2	*Offeror must describe the steps required to upgrade radio equipment to P25 phase 2 trunking operations.*				
7.3.3	*Radio equipment must support an air interface which fully conforms to TIA-102.BBAB, Phase 2 Two-Slot Time Division Multiple Access Physical Layer Protocol Specification.*				
7.3.4	*Radio equipment must have the capacity to support an air interface which fully conforms to TIA-102.BBAC, Phase 2 Two-Slot TDMA Media Access Control Layer Description.*				
7.4	*Trunking*				
7.4.1	*Radio equipment operation must fully conform with TIA-102.AABA-B, Trunking Overview.*				

Multi Band DVRS Radio Specifications

Article	Specifications	Compliance		Reference in Technical Bid	Bidder's Comments
		YES	NO		
7.4.2	*Radio equipment operation must fully conform with TIA-102.AABD-B, Trunking Procedures.*				
7.4.3	*In clarification of Section 6.6.1 of TIA document, TIA-102.AABD-B, the radio Equipment must respond to System generated Group Affiliation Queries described in Section 6.7.3 of the same document.*				
7.4.4	*Radio equipment must support the specified values presented in Section 17 of TIA-102.AABD-B.*				
7.4.5	*In clarification of section 12.6 of TIA document, TIA-102.AABD-B, the radio equipment must be capable of supporting 12 adjacent sites for each current site.*				
7.4.6	*Offeror must specify the maximum number of adjacent sites supported by the radio equipment.*				
7.4.7	*Radio equipment must be fully conformant with TIA-102.AABB-B, Trunking Control Channel Formats, excepting Protected TSBK and Protected Multi-Block TSBK.*				
7.4.8	*In clarification of Section 3.2 of TIA document, TIA-102.AABB-B, radio equipment must support dedicated control channel mode.*				
7.4.9	*Radio equipment must fully conform with TIA-102.AABC-E, Trunking Control Channel Messages.*				
7.4.10	*Radio equipment must fully conform with TIA-102.AABF-D, Link Control Word Formats and Messages.*				
7.4.11	*Offeror must specify any non-standard link control words used within the Link Control layer as specified by TIA-102.AABF-D, which are supported by their radio equipment.*				
7.4.12	*Supplier Declaration of Conformance (SDoC) and Summary Test Reports (STR) showing compliance with the Sections 2.2.2, 3 and 4 of US Department of Homeland Security Project 25 Compliance Assessment Bulletin, Baseline Common Air Interface Testing Requirements (P25-CAB-CAI_Test_Req July 2017) must be provided for radio equipment.*				
7.4.13	*In addition to the requirements of section 7.4.12, the Offeror must indicate the level of compliance of the radio equipment with the interoperability tests defined in TIA-102.CABC-C, Interoperability Testing for Voice Operation in Trunked Systems.*				
7.4.14	*The tests referenced in Section 7.4.13 must include the following tests which TIA-102.CABC-B classifies as Optional Functionality:*				

Multi Band DVRS Radio Specifications

Article	Specifications	Compliance		Reference in Technical Bid	Bidder's Comments
		YES	NO		
	a) 2.2.1.4.2 Test case 2 – Denied or refused registration;				
	b) 2.2.2.4.4 Test case 4 – Group call interrupt;				
	c) 2.2.2.4.5 Test case 5 – Group call routing;				
	d) 2.2.3.4.1 Test case 1 – Unit-to-unit call with target availability check;				
	e) 2.2.3.4.3 Test case 3 – Unit-to-unit call queued with target availability check – traffic channel assignment after target availability check;				
	f) 2.2.3.4.4 Test case 4 – Unit-to-unit call queued with target availability check – traffic channel assignment before target availability check;				
	g) 2.2.3.4.5 Test case 5 – Unit-to-unit call without target availability check;				
	h) 2.2.3.4.6 Test case 6 – Unit-to-unit call queued without target availability check;				
	i) 2.2.3.4.7 Test case 7 – Unit-to-unit call denied;				
	j) 2.2.5 Test Suite: Affiliation;				
	k) 2.2.6 Test Suite: Announcement group call;				
	l) 2.2.7 Test Suite: Emergency Alarm;				
	m) 2.2.7.4.2 Test case 2 – Emergency alarm, invalid radio;				
	n) 2.2.8 Test Suite: Emergency Group Call;				
	o) 2.2.8.4.2 Test case 2 – Pre-Programmed emergency call;				
	p) 2.2.8.4.3 Test case 3 – Emergency call, invalid radio;				
	q) 2.2.8.4.6 Test Case 6 – Emergency call request ruthless pre-emption;				
	r) 2.2.10 Test Suite: Encryption;				
	s) 2.2.12 Test Suite Authentication;				
	t) 2.2.15 Test Suite: Call Alert;				
	u) 2.2.16 Test Suite: Short Message;				
	v) 2.2.17 Test Suite: Status Query;				
	w) 2.2.18 Test Suite: Status Update;				
	x) 2.2.19 Test Suite Radio Unit Monitoring;				
	y) 2.2.19.4.2 Test case 2 – Radio Unit Monitor – Individual Silent;				
	z) 2.2.20 Test Suite: Radio Unit Disable/Re-enable;				
	aa) 2.2.21 Test Suite Radio Check;				
	bb) 2.2.22 Test Suite: Radio Detach;				

Multi Band DVRS Radio Specifications

Article	Specifications	Compliance		Reference in Technical Bid	Bidder's Comments
		YES	NO		
7.5	*P25 Conventional Operation*				
7.5.1	*Radio equipment must operate on conventional P25 systems.*				
7.5.2	*Radio equipment must support P25 simplex communications.*				
7.5.3	*Radio equipment must support P25 conventional vote-scan operation.*				
7.5.4	*Offeror must specify if radio equipment while in P25 conventional vote-scan operation is able to scan and receive on its own vote-scan Radio Equipment transmit frequency.*				
7.5.5	*Offeror must describe limits, on the span of frequencies and the number of frequencies allowed in the P25 conventional vote-scan list.*				
7.5.6	*Offeror must describe P25 conventional vote-scan functionality including but not limited to: algorithms used, scan rate, RSSI or BER threshold values, key performance metrics used in voting the best channel.*				
7.5.7	*In a hybrid system configuration (Conventional, Trunked operation) the Offeror must describe the different method(s) required if any, to switch between conventional and trunked operation and vice-versa.*				
7.5.8	*If the method(s) identified in section 7.5.7 require user intervention, the Offeror must outline the user process that would have to be followed to perform this switch.*				
7.5.9	*Offeror must identify and describe any areas where their radio equipment is not fully conformant with TIA-102.AABG, Conventional Control Messages. If no description is provided, the Offeror is deemed to have confirmed full conformity.*				
7.5.10	*Offeror must identify and describe any areas where their radio equipment is not fully conformant with TIA-102.BAAD-B, Conventional Procedures. If no description is provided, the Offeror is deemed to have confirmed full conformity.*				
7.5.11	*Offeror must identify and describe any areas where their radio equipment is not fully conformant with TIA-102.CABA-A: Interoperability Testing for Voice Operation in Conventional Systems. If no description is provided, the Offeror is deemed to have confirmed that it fully conforms to TIA-102.CABA-A.*				
7.6	*Data Service*				

Multi Band DVRS Radio Specifications

Article	Specifications	Compliance		Reference in Technical Bid	Bidder's Comments
		YES	NO		
7.6.1	*Radio equipment must conform to the recommendations and principles presented in TIA-102.BAEA-C, Data Overview and Specification.*				
7.6.2	*Radio equipment must be fully conformant with TIA-102.BAEB-B, IP Data Bearer Service Specification.*				
7.7	*Security and Encryption*				
7.7.1	*Radio equipment must conform to the recommendations and principles presented in TIA-102.AAAB-B, Security Services Overview.*				
7.7.2	*Radio equipment must be fully conformant with TIA-102.AAAD-B, Digital Land Mobile Radio Block Encryption Protocol.*				
7.7.3	*Radio equipment must support Advanced Encryption Standard (AES) as defined in Annex C of TIA-102.AAAD-B, Digital Land Mobile Radio Block Encryption Protocol.*				
7.7.4	*Radio equipment must utilize the encryption standard known as the Advanced Encryption Standard (AES 256 bit) using the Rijndael algorithm and be registered by the Federal Information Processing Standard (FIPS) as FIPS 197. Proof of radio equipment registration as FIPS 197 must be provided with the Offer.*				
7.7.5	*Radio equipment must be able to clearly display if the radio is in secure mode (encrypted) or clear mode (unencrypted).*				
7.8	*Encryption Keys*				
7.8.1	*Keys must be stored within a cryptographic module in the radio equipment in a manner which conforms at a minimum to FIPS 140-2 Level 1 security*				
7.8.2	*Radio equipment must contain data ports suitable for manual loading of encryption keys.*				
7.8.3	*A minimum of 32 unique active and 32 unique inactive traffic encryption keys must be supported in radio equipment.*				
7.8.4	*Offeror must state the number of unique active and inactive traffic encryption keys supported in radio equipment.*				
7.8.5	*Radio equipment must have an option to retain the encryption key indefinitely through periods of power loss.*				
7.8.6	*If non-destructive methods to zeroize cryptographic keys from non-functioning radio equipment exists, then Offeror must describe them with their response.*				

Multi Band DVRS Radio Specifications

Article	Specifications	Compliance		Reference in Technical Bid	Bidder's Comments
		YES	NO		
7.9	*Standard Key Fill Device (KFD)*				
7.9.1	*Radio equipment must be compatible with Offeror's proposed Key Fill Device.*				
7.9.2	*Key Fill Device(s) must be able to generate and store AES 256 bit keys.*				
7.9.3	*KFD unit(s) must comply with:*				
	a) Protocol (normative) - Project 25 key fill device (KFD) interface protocol, TIA-102.AACD-A.				
7.9.4	*Key Fill Device must be at a minimum NIST FIPS 140-2 level 1 certified.*				
7.9.5	*Offeror must indicate the quantity of radio equipment units that the proposed KFD is capable of provisioning using a unique UKEK per radio equipment unit and not a common provisioning key.*				
7.9.6	*Offeror must indicate the quantity of radio equipment units that the proposed KFD is capable of key loading, without reconnection to the KMF. The Offeror may assume for this requirement, each radio equipment unit will be loaded with a total of 4 unique AES256 keys (2 keysets for 2 SLNs).*				
7.10	*Request to Talk (RTT)*				
7.10.1	*Radio equipment must support in full the Request to Talk and Emergency Request to Talk requirements as presented in the RCMP RTT specification document found in Appendix A.1*				
7.11	*Over-The-Air-Rekeying (OTAR)*				
7.11.1	*Radio equipment must have P25 OTAR capability.*				
7.11.2	*Offeror must specify the following for their OTAR Server that they support and is proven to be compatible with their radio equipment:*				
	a) Make and Model numbers;				
	b) Dimensions;				
	c) Manufacturer specification sheets;				
	d) Power requirements;				
	e) Maximum power consumption;				
	f) Thermal load under maximum power consumption conditions; and				
	g) A test report must be included that validates any Offeror compatibility claims.				
7.11.3	*Radio equipment must fully conform to the recommendations and principles presented in TIA-102.AACA-A, Digital Radio Over-The-Air-Rekeying (OTAR) Messages and Procedures.*				
7.12	*Over-The-Air-Programming (OTAP)*				

Multi Band DVRS Radio Specifications

Article	Specifications	Compliance		Reference in Technical Bid	Bidder's Comments
		YES	NO		
7.12.1	Radio equipment must support Over-The-Air-Programming (OTAP) functionality.				
7.13	Location Services – Global Positioning System (GPS)				
7.13.1	Radio equipment must conform to the recommendations and principles presented in TIA-102.BAJA-B, Locations Service Overview.				
7.13.2	Radio equipment must conform with TIA-102.BAJC-B Tier 2 Location Services.				
7.13.3	Radio equipment must conform with TIA-102.BAJD-A TCP/UDP Port Number Assignments.				
7.13.4	The GPS receiver, excluding the GPS antenna, must be integrated fully within the radio equipment.				
7.13.5	In clarification of Section 2.1.5.1.1 of TIA-102.BAJC-B, radio equipment must be able to display the received location and be configurable to display the received location information from the Location Information System locally to its user in a common co-ordinate display format.				
7.13.6	In clarification of Section 2.1.5.1.2.1 of TIA-102.BAJC-B, radio equipment must at a minimum support the following two triggering conditions: a) Emergency; and b) Host Request.				
7.13.7	Offeror must describe all supported triggering conditions on radio equipment.				
7.13.8	Emergency and Host Request triggering conditions must be supported concurrently on radio equipment.				
7.13.9	Offeror must provide GPS specifications including typical time to generate initial position fix, and minimal signal levels required for acquisition and tracking for both cold and warm start conditions.				
7.13.10	Offeror must provide the impact to standard radio battery (section 9.3.2) capacity as a percentage when GPS feature is enabled versus when it is disabled over a period of 12 hours in encrypted mode, based on a 5-5-90 duty cycle, where the three values reflect the percentage of transmit, receive, and stand-by time, respectively with all GPS triggering conditions disabled.				
7.14	Radio Programming				
7.14.1	Radio programming software which permits software, firmware and configuration updates for each radio equipment model must be available.				

Multi Band DVRS Radio Specifications

Article	Specifications	Compliance		Reference in Technical Bid	Bidder's Comments
		YES	NO		
7.14.2	*Programming Software must permit the entry and modification of, at a minimum: Unit ID and alias (if desired), Modes of Operation parameters, displayed names for each Mode of Operation, all radio equipment configuration parameters, scan lists, frequencies and parameters, assignment of radio equipment button functionality (RTT, Emergency Call), and Radio Equipment display and audio options.*				
7.14.3	*Radio equipment configuration must permit the lock-out of radio equipment to prevent unauthorized modification or disclosure of configuration parameters.*				
7.14.4	*Offeror must describe the security mechanism, number of security levels permitted, and whether individual radio equipment parameters can be tied to a specific security level.*				
7.14.5	*Cloning of radio equipment programming on multiple radios must be supported. Cloning means the duplication of all radio configuration parameters except those parameters associated with radio equipment IDs.*				
7.14.6	*Offeror must specify the maximum number of radios which can be cloned at one time and describe the methodology.*				
7.14.7	*Radio equipment programming application must be capable of being installed on RCMP servers or computers on premises in a networked or standalone environment.*				
7.14.8	*Radio management software system that remotely manages radio configuration files, firmware or logical groupings of radios must be capable of being installed on RCMP servers or computers on premises in a networked or standalone environment.*				
7.14.8.1	*Radio management software system must have a method of role based access control to permit access to authorized users and to separate radio management systems administrators from authorized radio management systems users.*				
7.14.8.2	*Offeror must describe any database provisions and functions of the radio management software system for maintaining a record of the programming profiles for each radio.*				
7.14.9	*Radio equipment programming application must permit configuration parameters to be electronically distributed to service depots for radio equipment programming.*				

Multi Band DVRS Radio Specifications

Article	Specifications	Compliance		Reference in Technical Bid	Bidder's Comments
		YES	NO		
7.14.10	Radio equipment configuration files must be securable to prevent unauthorized modification or disclosure.				
7.14.11	Radio equipment must be able to verify firmware integrity or detect unauthorized changes or counterfeit firmware upon boot-up (Power On Self Test) and prevent startup or operation of radio.				
7.14.12	Programming software must function on COTS PC computers and Windows 10 64 Bit Operating Systems.				
7.14.13	Offeror must describe process undertaken to keep radio equipment programming software upgradable to support latest OS versions as they become available.				
7.14.14	Programming Cables must be supplied with USB 2.0 or higher interface for attachment to programming computers.				
7.15	Authentication				
7.15.1	Radio Equipment must be fully conformant with TIA-102.AACE-A, Link Layer Authentication, except for Mutual Authentication.				
7.15.2	The authentication keys must be loadable into radio equipment and authentication server via an automated process using a Key Fill Device.				
7.15.3	Offeror must describe the systems with which radio equipment has been certified by the Offeror to operate on using the authentication features described above. Proof of certification must be provided before the solicitation period close.				
7.16	Warranty				
7.16.1	The offeror must provide a comprehensive warranty program for all radio equipment offered which provides, at a minimum, the following:				
	a) Product defect/malfunction correction and replacement;				
	b) Product security vulnerability (hardware/software) correction and replacement;				
	c) Product performance deficiency correction from stated product specifications as of the time of this RFSO solicitation period closing date;				
	d) Product replacement, testing and restoration to factory specifications;				
	e) Product shipping expenses, to and from Offeror's facilities.				
	a. Offeror must list the location/s of authorized repair facilities that radio equipment would be sent to for warranty or paid repairs.				

Multi Band DVRS Radio Specifications

Article	Specifications	Compliance		Reference in Technical Bid	Bidder's Comments
		YES	NO		
7.16.2	*Offeror must provide their product repair time lines for radio equipment undergoing warranty repairs. The timeline must start when Offeror receives the radio equipment at their facilities and ends when radio equipment departs their facilities.*				
7.16.3	*Offeror must provide their product replacement time lines for radio equipment undergoing warranty replacements. The timeline must start when Offeror receives the radio equipment at their facilities and ends when radio equipment departs their facilities.*				
7.16.4	*Offeror must describe what services other than the ones listed in section 7.16.1, their comprehensive warranty entails for their radio equipment.*				
7.16.5	*Offeror must indicate the duration in months of their standard comprehensive warranty for their radio equipment.*				
7.16.6	*Offeror must offer an extended standard comprehensive warranty for their radio equipment for a 10-year term.*				
7.16.7	*In addition to the foregoing, the Offeror must, at all times during the existence of the Standing Offer and for any Contract whose term extends beyond the expiration of the Standing Offer, and at no additional cost to the Authorized Users, rectify and resolve any identified security vulnerability for radio equipment (Hardware or Software), within a mutually agreed upon timeframe between the Offeror and Technical Authority or Standing Offer authority, as applicable. The permissible resolution timeframe will depend on the severity, impact and complexity of identified vulnerability.*				
7.17 Mean Time Between Failure (MTBF)					
7.17.1	*Offeror must indicate approximate Mean Time Between Failure and reliability of their radio equipment.*				
8 Band Specific Requirements					
NOTE** Refer to Section 4.2.4:* ***For P25 Digital Vehicular Repeater Systems, the Offeror must supply repeater systems that meet all requirements of Section 12 of this Statement of Requirement and Offerors must Supply compatible radio equipment capable of multi-band operations in all 3 bands as identified in Section 8 of this SOR *Thus: 7/800 must meet Section 8.2, UHF must meet Section 8.3 and VHF must meet Section 8.4.*					
8.1 General					

Multi Band DVRS Radio Specifications

Article	Specifications	Compliance		Reference in Technical Bid	Bidder's Comments
		YES	NO		
8.1.1	Radio equipment must meet or exceed the performance recommendations presented in TIA-102.CAAB-D, Land Mobile Transceiver Performance Recommendations, Digital Radio Technology C4FM/CQPSK Modulation when operating in P25 Phase 1 mode.				
8.2	**768-776 MHz, 798-806 MHz, 806-824 MHz and 851-869 MHz (700/800) Band Specific SU Requirements**				
8.2.1	Standards				
8.2.1.1	Radio equipment must conform to the requirements defined in SRSP-502 and SRSP-511. (700/800 MHz)				
8.2.2	Regulatory 700/800 MHz Band Requirement				
8.2.2.1	Radio equipment must be programmable with frequencies in the range of 768-776 MHz, 798-806, 806-824 MHz and 851-869 MHz and the user must be able to select assignable channels within that range.				
8.2.3	Portable Radio Radio Frequency (RF) Specifications must meet the following:				
8.2.3.1	General				
8.2.3.1.1	Frequency range 768-776, 798-806, 806-824 and 851-869 MHz				
8.2.3.1.2	Channel spacing (700MHz) 12.5 kHz and 25kHz				
8.2.3.1.3	Channel spacing (800MHz) 12.5 kHz and 25 kHz				
8.2.3.1.4	Operating temperature range -30°C to +60°C				
8.2.3.2	Transmitter Specifications				
8.2.3.2.1	Modulation limiting (700MHz): +/- 2.5 kHz (12.5 kHz channel) +/- 5.0 kHz (25 kHz channel);				
8.2.3.2.2	Modulation limiting (800MHz): +/- 2.5 kHz (12.5 kHz channel) +/- 5.0 kHz (25 kHz channel);				
8.2.3.2.3	FM hum & noise better than -37 dB				
8.2.3.2.4	Audio response +1, -3dB, 300 to 2500 Hz				
8.2.3.2.5	Frequency stability +/- 1.5 ppm				
8.2.3.2.6	Portable radio must deliver a minimum of 2.5 Watts RF power to the antenna port in the 700 MHz band.				
8.2.3.2.7	Portable radio must deliver a minimum of 3 Watts RF power to the antenna port in the 800 MHz band.				
8.2.3.2.8	Offerors must specify the maximum RF output power as defined by Section 3.2.1 of TIA-102.CCAB-A.				

Multi Band DVRS Radio Specifications

Article	Specifications	Compliance		Reference in Technical Bid	Bidder's Comments
		YES	NO		
8.2.3.2.9	Offerors must specify the allowable range that the RF output power may be adjusted to while still meeting or exceeding the recommendations specified in TIA-102.CCAB-A.				
8.2.3.2.10	Portable radio must be user selectable between high and low transmit power settings.				
8.2.3.2.11	The high low transmit power select feature must be enabled disabled during radio programming.				
8.2.3.3	Receiver Specifications				
8.2.3.3.1	Sensitivity (digital) 0.25 µv (-119 dBm) 5% BER				
8.2.3.3.2	Inter modulation rejection -70 dB (TIA/EIA 102)				
8.2.3.3.3	Adjacent channel selectivity -60 dB (TIA/EIA 102)				
8.2.3.3.4	Spurious response rejection -70 dB				
8.2.3.3.5	Audio distortion at rated audio better than 3% (500 milliwatts)				
8.2.3.3.5.1	Offerors must specify the signal level at the antenna port required to achieve a BER of 2.0% in a fading environment.				
8.2.4	Mobile Radio RF Specifications must meet the following:				
8.2.4.1	General				
8.2.4.1.1	Frequency range 768-776, 798-806, 806-824 and 851-869 MHz				
8.2.4.1.2	Channel spacing (700MHz) 12.5 kHz and 25kHz				
8.2.4.1.3	Channel spacing (800MHz) 12.5 kHz and 25 kHz				
8.2.4.1.4	Operating temperature range -30°C to +60°C				
8.2.4.2	Transmitter Specifications				
8.2.4.2.1	Transmit power programmable to 30 watts				
8.2.4.2.2	Modulation limiting (700MHz) +/- 2.5 kHz (12.5 kHz channel) +/- 5.0 kHz (25 kHz channel);				
8.2.4.2.3	Modulation limiting (800MHz) +/- 2.5 kHz (12.5 kHz channel); +/- 5.0 kHz (25 kHz channel);				
8.2.4.2.4	FM hum & noise better than -37 dB				
8.2.4.2.5	Audio response +1, -3dB, 300 to 2500 Hz				
8.2.4.2.6	Frequency stability +/- 1.5 ppm				
8.2.4.2.7	Offeror must specify the maximum RF output power as defined by Section 3.2.1 of TIA-102.CCAB.				
8.2.4.2.8	Offerors must specify the allowable range that the RF output power may be adjusted to while still meeting or exceeding the recommendations specified in TIA-102.CCAB				
8.2.4.2.9	Mobile radio transmit power must be adjustable in software as a part of the radio profile.				
8.2.4.3	Receiver Specifications				

Multi Band DVRS Radio Specifications

Article	Specifications	Compliance		Reference in Technical Bid	Bidder's Comments
		YES	NO		
8.2.4.3.1	Sensitivity (digital) 0.25 µv (-119 dBm) 5% BER				
8.2.4.3.2	Inter modulation rejection -75 dB (TIA/EIA 102)				
8.2.4.3.3	Adjacent channel selectivity -60 dB (TIA/EIA 102)				
8.2.4.3.4	Spurious response rejection -80 dB				
8.2.4.3.5	Audio distortion at rated audio better than 3% (60% modulation 1 kHz)				
8.2.4.3.6	Offerors must specify the signal level at the antenna port required to achieve a BER of 2.0% in a fading environment.				
8.2.5	Desk-Mounted Radio RF Specifications must meet the following:				
8.2.5.1	General				
8.2.5.1.1	Frequency range 768-776, 798-806, 806-824 and 851-869 MHz				
8.2.5.1.2	Channel spacing (700MHz) 12.5 kHz and 25kHz				
8.2.5.1.3	Channel spacing (800MHz) 12.5 kHz and 25 kHz				
8.2.5.1.4	Operating temperature range -30°C to +60°C				
8.2.5.2	Transmitter Specifications				
8.2.5.2.1	Transmit power programmable to 30 watts				
8.2.5.2.2	Modulation limiting (700MHz) +/- 2.5 kHz (12.5 kHz channel) +/- 5.0 kHz (25 kHz channel);				
8.2.5.2.3	Modulation limiting (800MHz) +/- 2.5 kHz (12.5 kHz channel); +/- 5.0 kHz (25 kHz channel);				
8.2.5.2.4	FM hum & noise better than -37 dB				
8.2.5.2.5	Audio response +1, -3dB, 300 to 2500 Hz				
8.2.5.2.6	Frequency stability +/- 1.5 ppm				
8.2.5.2.7	Offeror must specify the maximum RF output power as defined by Section 3.2.1 of TIA-102.CCAB.				
8.2.5.2.8	Offerors must specify the allowable range that the RF output power may be adjusted to while still meeting or exceeding the recommendations specified in TIA-102.CCAB				
8.2.5.2.9	Desk-Mounted radio transmit power must be adjustable in software as a part of the radio profile.				
8.2.5.3	Receiver Specifications				
8.2.5.3.1	Sensitivity (digital) 0.25 µv (-119 dBm) 5% BER				
8.2.5.3.2	Inter modulation rejection -75 dB (TIA/EIA 102)				
8.2.5.3.3	Adjacent channel selectivity -60 dB (TIA/EIA 102)				
8.2.5.3.4	Spurious response rejection -80 dB				
8.2.5.3.5	Audio distortion at rated audio better than 3% (60% modulation 1 kHz)				

Multi Band DVRS Radio Specifications

Article	Specifications	Compliance		Reference in Technical Bid	Bidder's Comments
		YES	NO		
8.2.5.3.6	Offerors must specify the signal level at the antenna port required to achieve a BER of 2.0% in a fading environment.				
8.3	**380-430 MHz and 450-470 MHz (UHF) Band Specific SU Requirements**				
8.3.1	Standards				
8.3.1.1	Radio equipment must conform to the requirements defined in SRSP-501. (UHF)				
8.3.2	Regulatory Band Requirement				
8.3.2.1	Radio equipment must be programmable with frequencies in the range of 380-430 MHz and 450-470 MHz and the user must be able to select assignable channels within that range.				
8.3.3	Portable Radio RF Specifications must meet the following:				
8.3.3.1	General				
8.3.3.1.1	Frequency Range: 380 to 430 MHz and 450 to 470 MHz				
8.3.3.1.2	Channel Spacing: 12.5 KHz and 25 KHz				
8.3.3.1.3	Operating temperature range -30°C to +60°C				
8.3.3.2	Transmitter Specifications				
8.3.3.2.1	Modulation limiting +/- 2.5 kHz (12.5 kHz channel) +/- 5.0 kHz (25 kHz channel);				
8.3.3.2.2	FM hum & noise better than -34 dB				
8.3.3.2.3	Audio response +1, -3dB, 300 to 2500 Hz				
8.3.3.2.4	Frequency stability +/- 2.0 ppm				
8.3.3.2.5	Portable radio must deliver a minimum of 4 Watts RF power to the antenna port.				
8.3.3.2.6	Offerors must specify the maximum RF output power as defined by Section 3.2.1 of TIA-102.CCAB-A.				
8.3.3.2.7	Offerors must specify the allowable range that the RF output power may be adjusted to while still meeting or exceeding the recommendations specified in TIA-102.CCAB-A.				
8.3.3.2.8	Portable radio must be user selectable between high and low transmit power settings.				
8.3.3.2.9	The high low transmit power select feature must be enabled disabled during radio programming.				
8.3.3.3	Receiver Specifications				
8.3.3.3.1	Sensitivity (digital) 0.25 µv (-119 dBm) 5% BER				
8.3.3.3.2	Inter modulation rejection -70 dB (TIA/EIA 102)				
8.3.3.3.3	Adjacent channel selectivity -60 dB (TIA/EIA 102)				
8.3.3.3.4	Spurious response rejection -70 dB				

Multi Band DVRS Radio Specifications

Article	Specifications	Compliance		Reference in Technical Bid	Bidder's Comments
		YES	NO		
8.3.3.3.5	Audio distortion at rated audio better than 3% (500 milliwatts)				
8.3.3.3.6	Offerors must specify the signal level at the antenna port required to achieve a BER of 2.0% in a fading environment.				
8.3.4	Mobile Radio RF Specifications must meet the following:				
8.3.4.1	General				
8.3.4.1.1	Frequency range 380 to 430 MHz to 450 to 470 MHz				
8.3.4.1.2	Channel spacing 12.5 kHz and 25 kHz				
8.3.4.1.3	Operating temperature range -30°C to +60°C				
8.3.4.2	Transmitter Specifications				
8.3.4.2.1	Transmit power programmable to 30 watts				
8.3.4.2.2	Modulation limiting: +/- 2.5 kHz (12.5 kHz channel) +/- 5.0 kHz (25 kHz channel);				
8.3.4.2.3	FM hum & noise better than -34 dB				
8.3.4.2.4	Audio response +1, -3dB, 300 to 2500 Hz				
8.3.4.2.5	Frequency stability +/- 2.0 ppm				
8.3.4.2.6	Offeror must specify the maximum RF output power as defined by Section 3.2.1 of TIA-102.CCAB.				
8.3.4.2.7	Offerors must specify the allowable range that the RF output power may be adjusted to while still meeting or exceeding the recommendations specified in TIA-102.CCAB				
8.3.4.2.8	Mobile radio transmit power must be adjustable in software as a part of the radio profile.				
8.3.4.3	Receiver Specifications				
8.3.4.3.1	Sensitivity (digital) 0.25 µv (-119 dBm) 5% BER				
8.3.4.3.2	Inter modulation rejection -75 dB (TIA/EIA 102)				
8.3.4.3.3	Adjacent channel selectivity -60 dB (TIA/EIA 102)				
8.3.4.3.4	Spurious response rejection -80 dB				
8.3.4.3.5	Audio distortion at rated audio better than 3% (60% modulation 1 kHz)				
8.3.4.3.6	Offerors must specify the signal level at the antenna port required to achieve a BER of 2.0% in a fading environment.				
8.3.5	Desk-Mounted Radio RF Specifications must meet the following:				
8.3.5.1	General				
8.3.5.1.1	Frequency range 380 to 430 MHz to 450 to 470 MHz				
8.3.5.1.2	Channel spacing 12.5 kHz and 25 kHz				

Multi Band DVRS Radio Specifications

Article	Specifications	Compliance		Reference in Technical Bid	Bidder's Comments
		YES	NO		
8.3.5.1.3	Operating temperature range -30°C to +60°C				
8.3.5.2	Transmitter Specifications				
8.3.5.2.1	Transmit power programmable to 30 watts				
8.3.5.2.2	Modulation limiting: +/- 2.5 kHz (12.5 kHz channel) +/- 5.0 kHz (25 kHz channel);				
8.3.5.2.3	FM hum & noise better than -34 dB				
8.3.5.2.4	Audio response +1, -3dB, 300 to 2500 Hz				
8.3.5.2.5	Frequency stability +/- 2.0 ppm				
8.3.5.2.6	Offeror must specify the maximum RF output power as defined by Section 3.2.1 of TIA-102.CCAB.				
8.3.5.2.7	Offerors must specify the allowable range that the RF output power may be adjusted to while still meeting or exceeding the recommendations specified in TIA-102.CCAB				
8.3.5.2.8	Desk-Mounted radio transmit power must be adjustable in software as a part of the radio profile.				
8.3.5.3	Receiver Specifications				
8.3.5.3.1	Sensitivity (digital) 0.25 µv (-119 dBm) 5% BER				
8.3.5.3.2	Inter modulation rejection -75 dB (TIA/EIA 102)				
8.3.5.3.3	Adjacent channel selectivity -60 dB (TIA/EIA 102)				
8.3.5.3.4	Spurious response rejection -80 dB				
8.3.5.3.5	Audio distortion at rated audio better than 3% (60% modulation 1 kHz)				
8.3.5.3.6	Offerors must specify the signal level at the antenna port required to achieve a BER of 2.0% in a fading environment.				
8.4	**138-144 MHz and 148-174 MHz (VHF) Band Specific SU Requirements**				
8.4.1	Standards				
8.4.1.1	Radio equipment must conform to the requirements defined in SRSP-500. (VHF)				
8.4.2	Regulatory Band Requirement				
8.4.2.1	Radio equipment must be programmable with frequencies in the range of 138-144 MHz and 148-174 MHz and the user must be able to select assignable channels within that range.				
8.4.3	Portable Radio RF Specifications must meet the following:				
8.4.3.1	General				
8.4.3.1.1	Frequency Range: 138 to 144 MHz and 148 -174 MHz				
8.4.3.1.2	Channel Spacing: 12.5 KHz and 25 KHz				
8.4.3.1.3	Operating temperature range -30°C to +60°C				

Multi Band DVRS Radio Specifications

Article	Specifications	Compliance		Reference in Technical Bid	Bidder's Comments
		YES	NO		
8.4.3.2	*Transmitter Specifications*				
8.4.3.2.1	*Modulation limiting:* *+/- 2.5 kHz (12.5 kHz channel)* *+/- 5.0 kHz (25 kHz channel);*				
8.4.3.2.2	*FM hum & noise better than -34 dB*				
8.4.3.2.3	*Audio response +1, -3dB, 300 to 2500 Hz*				
8.4.3.2.4	*Frequency stability +/- 2.5 ppm*				
8.4.3.2.5	*Portable radio must deliver a minimum of 5 Watts RF power to the antenna port.*				
8.4.3.2.6	*Offerors must specify the maximum RF output power as defined by Section 3.2.1 of TIA-102.CCAB-A.*				
8.4.3.2.7	*Offerors must specify the allowable range that the RF output power may be adjusted to while still meeting or exceeding the recommendations specified in TIA-102.CCAB-A.*				
8.4.3.2.8	*Portable radio must be user selectable between high and low transmit power settings.*				
8.4.3.2.9	*The high low transmit power select feature must be enabled disabled during radio programming.*				
8.4.3.3	*Receiver Specifications*				
8.4.3.3.1	*Sensitivity (digital) 0.22 µv (-120 dBm) 5% BER*				
8.4.3.3.2	*Inter modulation rejection -70 dB (TIA/EIA 102)*				
8.4.3.3.3	*Adjacent channel selectivity -60 dB (TIA/EIA 102)*				
8.4.3.3.4	*Spurious response rejection -70 dB*				
8.4.3.3.5	*Audio distortion at rated audio better than 3% (500 milliwatts)*				
8.4.3.3.6	*Offerors must specify the signal level at the antenna port required to achieve a BER of 2.0% in a fading environment.*				
8.4.4	*Mobile Radio RF Specifications must meet the following:*				
8.4.4.1	*General*				
8.4.4.1.1	*Frequency range 138 to 144 MHz and 148 -174 MHz*				
8.4.4.1.2	*Channel spacing 12.5 kHz and 25 kHz*				
8.4.4.1.3	*Operating temperature range -30°C to +60°C*				
8.4.4.2	*Transmitter Specifications*				
8.4.4.2.1	*Transmit power programmable to 30 watts*				
8.4.4.2.2	*Modulation limiting:* *+/- 2.5 kHz (12.5 kHz channel)* *+/- 5.0 kHz (25 kHz channel);*				
8.4.4.2.3	*FM hum & noise better than -34 dB*				
8.4.4.2.4	*Audio response +1, -3dB, 300 to 2500 Hz*				

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Article	Specifications	Compliance		Reference in Technical Bid	Bidder's Comments
		YES	NO		
8.4.4.2.5	Frequency stability +/- 2.5 ppm				
8.4.4.2.6	Offeror must specify the maximum RF output power as defined by Section 3.2.1 of TIA-102.CCAB.				
8.4.4.2.7	Offerors must specify the allowable range that the RF output power may be adjusted to while still meeting or exceeding the recommendations specified in TIA-102.CCAB				
8.4.4.2.8	Mobile radio transmit power must be adjustable in software as a part of the radio profile				
8.4.4.3	Receiver Specifications				
8.4.4.3.1	Sensitivity (digital) 0.25 µv (-119 dBm) 5% BER				
8.4.4.3.2	Inter modulation rejection -75 dB (TIA/EIA 102)				
8.4.4.3.3	Adjacent channel selectivity -60 dB (TIA/EIA 102)				
8.4.4.3.4	Spurious response rejection -80 dB				
8.4.4.3.5	Audio distortion at rated audio better than 3% (60% modulation 1 kHz)				
8.4.4.3.6	Offerors must specify the signal level at the antenna port required to achieve a BER of 2.0% in a fading environment.				
8.4.5	Desk-Mounted Radio RF Specifications must meet the following:				
8.4.5.1	General				
8.4.5.1.1	Frequency range 138 to 144 MHz and 148 -174 MHz				
8.4.5.1.2	Channel spacing 12.5 kHz and 25 kHz				
8.4.5.1.3	Operating temperature range -30°C to +60°C				
8.4.5.2	Transmitter Specifications				
8.4.5.2.1	Transmit power programmable to 30 watts				
8.4.5.2.2	Modulation limiting: +/- 2.5 kHz (12.5 kHz channel) +/- 5.0 kHz (25 kHz channel);				
8.4.5.2.3	FM hum & noise better than -34 dB				
8.4.5.2.4	Audio response +1, -3dB, 300 to 2500 Hz				
8.4.5.2.5	Frequency stability +/- 2.5 ppm				
8.4.5.2.6	Offeror must specify the maximum RF output power as defined by Section 3.2.1 of TIA-102.CCAB.				
8.4.5.2.7	Offerors must specify the allowable range that the RF output power may be adjusted to while still meeting or exceeding the recommendations specified in TIA-102.CCAB				
8.4.5.2.8	Desk-Mounted radio transmit power must be adjustable in software as a part of the radio profile.				

Multi Band DVRS Radio Specifications

Article	Specifications	Compliance		Reference in Technical Bid	Bidder's Comments
		YES	NO		
8.4.5.3	*Receiver Specifications*				
8.4.5.3.1	*Sensitivity (digital) 0.25 µv (-119 dBm) 5% BER*				
8.4.5.3.2	*Inter modulation rejection -75 dB (TIA/EIA 102)*				
8.4.5.3.3	*Adjacent channel selectivity -60 dB (TIA/EIA 102)*				
8.4.5.3.4	*Spurious response rejection -80 dB*				
8.4.5.3.5	*Audio distortion at rated audio better than 3% (60% modulation 1 kHz)*				
8.4.5.3.6	*Offerors must specify the signal level at the antenna port required to achieve a BER of 2.0% in a fading environment.*				
9	***Portable Radio Specific Specifications***				
9.1 General					
9.1.1	*Portable radio must support unit-to-unit direct operation (conventional simplex or "talk around") using P25 Phase 1 and analogue or mixed mode operation.*				
9.1.2	*Portable radio must have an audio output of 0.5 Watt at no more than 1.5% audio distortion level.*				
9.1.3	*Offeror must provide a list of supported hex values for single-button press, status update messages (STS_UPDT_REQ) by their portable radio.*				
9.2 Environmental Requirements					
9.2.1	*The following provides the minimum environmental standards which must be met, unless more stringent environmental standards apply elsewhere in the SOR.*				
9.2.2	*Radio equipment and accessories, excluding batteries, must operate within tolerances across an ambient temperature range of at least -30°C to +60°C.*				
9.2.3	*Portable Radio Equipment including battery and remote speaker microphone must be IP67 rated.*				
9.2.5	*Offeror must provide the impact to battery performance (Max. charge capacity, discharge rate) when operating at ambient temperature range extremes (-30°C to +60°C), for each battery options offered.*				
9.2.6	*Radio equipment must comply with MIL-STD 810G Laboratory Test Method Low Pressure (500.5), Procedure 2;*				
9.2.7	*Radio equipment must comply with MIL-STD 810G Laboratory Test Method High Temperature (501.5), Procedure 2;*				
9.2.8	*Radio equipment must comply with MIL-STD 810G Laboratory Test Method Low Temperature (502.5) Procedure 1/C2 and Procedure 2/C1;*				

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Article	Specifications	Compliance		Reference in Technical Bid	Bidder's Comments
		YES	NO		
9.2.9	*Radio equipment must comply with MIL-STD 810G Laboratory Test Method Temperature Shock (503.5);*				
9.2.10	*Offeror must indicate the procedure tested for MIL-STD 810G Laboratory Test Method Temperature Shock 503.5.*				
9.2.11	*Radio equipment must comply with MIL-STD 810G Laboratory Test Method Solar Radiation (505.5);*				
9.2.12	*Offeror must indicate the procedure and parameter tested for MIL-STD 810G Laboratory Test Method Solar Radiation 505.5.*				
9.2.13	*Radio equipment must comply with MIL-STD 810G Laboratory Test Method Rain (506.5) Procedure 1;*				
9.2.14	*Radio equipment must comply with MIL-STD 810G Laboratory Test Method Humidity (507.5);*				
9.2.15	*Offeror must indicate the procedure tested for MIL-STD 810G Laboratory Test Method Humidity 507.5.*				
9.2.16	*Radio equipment must comply with MIL-STD 810G Laboratory Test Method Salt Fog (509.5);*				
9.2.17	*Radio equipment must comply with MIL-STD 810G Laboratory Test Method Dust and Sand (510.5) Procedure 1 and Procedure 2;*				
9.2.18	*Radio equipment must comply with MIL-STD 810G Laboratory Test Method Immersion (512.5) Procedure 1;*				
9.2.19	*Radio equipment must comply with MIL-STD 810G Laboratory Test Method Vibration (514.6) Category 1; and*				
9.2.20	*Radio equipment must comply with MIL-STD 810G Laboratory Test Method Shock (516.6) Procedure 1, Procedure 4 and Procedure 6.*				
9.3	Battery				
9.3.1	*Offeror's portable radio must use detachable batteries.*				
9.3.2	*Offeror must provide a high capacity Li-ion battery capable of powering their portable radio for a minimum of 12 hours in encrypted mode (conventional or trunking), based on a 5-5-90 duty cycle, where the three values reflect the percentage of transmit, receive, and stand-by time, respectively. On P25 trunking channels stand-by time is defined as the period of time that the radio equipment is monitoring the assigned P25 trunking control channel.*				

Multi Band DVRS Radio Specifications

Article	Specifications	Compliance		Reference in Technical Bid	Bidder's Comments
		YES	NO		
9.3.3	*Offeror must describe the range of batteries that are available for their radio equipment including the technology, temperature ratings, amp-hour ratings, recharge life cycles, typical performance (operating time versus duty cycle, encrypted versus clear operation, and with various high and low temperature conditions).*				
9.3.4	*Offeror must describe any local or enterprise based battery management solutions and their capabilities, which are supported for their radio equipment.*				
9.4	*Physical Specifications*				
9.4.1	*Offeror must specify the following for their portable radio(s):*				
	a) Make and Model number;				
	b) Manufacturer specification sheet;				
	c) ISEDC type approval number;				
	d) Dimensions (without antenna and battery); and				
	e) Weight (without antenna and battery).				
9.5	*P25 Air Interface*				
9.5.1	*Portable radio must support P25 Phase 1 Air Interface as defined by Section 7.2 of this SOR.*				
9.5.2	*Portable radio must support P25 Phase 2 Air Interface as defined by Section 7.3 of this SOR.*				
9.6	*Noise Cancellation*				
9.6.1	*Radio Equipment must be designed for effective operation in high noise environments and must employ noise cancelling technologies.*				
9.6.2	*Offeror must describe the design, capabilities, and real-life test scenarios of their noise cancelling technologies.*				
9.6.3	*Offeror must describe if it is possible for the Subscriber Unit user to enable or disable the noise cancelling technology referenced in Section 9.6.1.*				
9.7	*Antenna*				
9.7.1	*Portable radio must be supplied with a removable, flexible, coated antenna.*				
9.7.2	*Portable radio antennas must be designed for operation on the specific operating frequency band(s) supported by the portable radio.*				
9.7.3	*Offeror must provide the radio antenna gain(s) and radiation pattern(s) in the worst case horizontal direction for all antenna supported band(s) (based on vertical antenna orientation) for each of the antenna models.*				

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Article	Specifications	Compliance		Reference in Technical Bid	Bidder's Comments
		YES	NO		
9.7.4	*A Bayonet Neill–Concelman "BNC" adapter must be available in place of the antenna for connection of an external antenna or for testing purposes.*				
9.7.5	*Offeror must describe the full range of available antennas. Antenna options must include the bandwidth(s) range(s) supported as a gain and/or VSWR plot against frequency(s) and antenna efficiency numbers.*				
9.7.6	*Offeror must provide the dimensions, height and diameter at base and tip, in millimetres and the weight in grams, of the standard antenna supplied with each portable radio model.*				
9.8	*Visual Display and Audible Indicators*				
9.8.1	*Portable radio must incorporate a backlit display.*				
9.8.2	*Portable radio must have an alphanumeric screen to display talkgroup/channel information with a minimum of 8 characters over one line.*				
9.8.3	*Portable radio alphanumeric screen must have a second line to display zone information with a minimum of 8 characters.*				
9.8.4	*Portable radio display must be easily readable and understandable under low and bright light conditions.*				
9.8.5	*Portable radio display illumination period must be programmable to conserve battery life if desired.*				
9.8.6	*Portable radio display illumination must be activated by a programmable button and must be activated when the mode, channel or zone is changed.*				
9.8.7	*Portable radio user must be able to turn off all illuminations, status lights and all audible indicators on radio while still able to operate the radio in a normal fashion otherwise.*				
9.8.8	*The functionality described in Section 9.8.7 must be configurable as enabled or disabled in the portable radio configuration.*				
9.8.9	*The display must include an indication of the approximate radio receive signal strength (RSSI) when operating on a trunked channel.*				
9.8.10	*Portable radio display must provide an accurate visual indication of battery life.*				
9.8.11	*The display must clearly indicate operation on an encrypted channel.*				
9.8.13	*Offeror must specify all indications the top facing display is capable of showing.*				
9.8.14	*Portable radio must be capable of using audible tones to alert the user to events.*				

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Article	Specifications	Compliance		Reference in Technical Bid	Bidder's Comments
		YES	NO		
9.8.15	*Audible tones and tone volumes must be configurable for each event type through the radio programming software.*				
9.8.16	*Portable Radio must provide an audible tone to the user if the Push To Talk (PTT) is activated and the user is out of coverage or if there is no channel available (e.g., busy) when operating on a trunked system. The tone must be different for each of the no coverage and no channel system states.*				
9.9	*Capacity*				
9.9.1	*Portable radio must have at a minimum capacity for at least 512 modes of operation (talkgroups/channels) that permit programming of various frequency channels, modes of modulation.*				
9.9.2	*Portable radio modes of operation must be programmable by talkgroup/channel.*				
9.10	*Controls*				
9.10.1	*Portable radio must be designed such that core radio controls are easy to understand and operate.*				
9.10.2	*Portable Radio controls must be designed such that they can be operated while the user is wearing gloves.*				
9.10.3	*Volume Control*				
9.10.3.1	*Portable Radio primary volume adjustment must be via a single turn rotary control.*				
9.10.3.2	*The rotary volume control must incorporate the radio on/off power switch.*				
9.10.3.3	*The rotary volume control must not be inadvertently adjusted by bumping or brushing against user clothing or equipment.*				
9.10.4	*Channel Selector*				
9.10.4.1	*A single turn rotary knob must be used to select one of a minimum of sixteen primary channels/talkgroups.*				
9.10.4.2	*This single turn rotary knob must have a permanent stop or other indicator at the first and last channel position.*				
9.10.4.3	*The control position of this single turn rotary knob must not be easily altered by accidental bumping or brushing of clothing.*				
9.10.5	*Portable radio volume control and channel selector knobs must be independent of one another.*				
9.10.6	*Portable Radio must support function keys (i.e. ramp keys) to select a specific subset of the available Mode of Operations.*				

Multi Band DVRS Radio Specifications

Article	Specifications	Compliance		Reference in Technical Bid	Bidder's Comments
		YES	NO		
9.10.7	Offeror must describe the configurable function keys which are available on the portable radio.				
9.10.8	Offeror must describe the configurable function keys which can be used for status message generation.				
9.11 Chargers					
9.11.1	General				
9.11.1.1	The battery chargers must be Canadian Standards Association (CSA), Underwriters Laboratories Canada (ULC), or Canada European Testing Laboratories (CETL) approved for all alternating current (AC) line powered equipment.				
9.11.1.2	All chargers and vehicle adapters offered must be optimized to support the chemistry of batteries offered.				
9.11.1.3	Portable radio battery chargers must not affect the battery charge capacity of batteries left in the chargers for extended periods of time (up to 2 weeks minimum).				
9.11.1.4	All chargers must charge the battery while it is attached to the radio.				
9.11.2	Single bay charger				
9.11.2.1	Single unit desktop chargers capable of charging to 80% capacity a fully discharged high-capacity battery in no more than four (4) hours must be available.				
9.11.3	Multi bay charger				
9.11.3.1	A charger capable of simultaneously charging four or more batteries must be available with the following characteristics:				
	a) Capable of fast charging to 80% capacity four fully discharged high capacity batteries in no more than eight (8) hours and preferably within four (4) hours;				
	b) Available in desk mount and wall mount versions;				
	c) Capable of providing individually controlled and optimized charging of each battery (optimized for the technology of the individual battery);				
	d) Provide capacity testing capability and as applicable, battery exercising; and				
	e) Support all offered battery types either as a standard feature or as optional inserts or adapters.				
9.11.4	Vehicular Charger				

Multi Band DVRS Radio Specifications

Article	Specifications	Compliance		Reference in Technical Bid	Bidder's Comments
		YES	NO		
9.11.4.1	*The basic vehicular adapters must be available for radio equipment that are designed for secure (rugged) mounting in vehicles and operation off of the vehicle 12 volt DC supply.*				
9.11.4.2	*The basic vehicular charger must charge to 80% capacity a fully discharged high-capacity battery in no more than four (4) hours at a rate that will not damage the battery.*				
9.11.4.3	*The basic vehicular charger must indicate whether it is charging or has completed charging.*				
9.12 Accessories					
9.12.1	*All accessories, batteries, microphones, shrouds, chargers, belt-clips and antennas must be able to be connected to and disconnected from the radio by the user while the radio is 'powered on' without the radio or attached accessories sustaining damage.*				
9.12.2	*Remote Speaker Microphones (RSM) must be available for all portable radio models.*				
9.12.2.1	*All RSM(s) must have an Emergency button (ERTT), an RTT button and an ear piece connector on the body of the speaker microphone itself.*				
9.12.3	*Portable radio must have the following accessories available for all models:*				
	a) Traffic and motorcycle headset and helmet kits;				
	b) Speaker/microphone suitable for marine environment;				
	c) Ear microphone kit;				
	d) Bluetooth kits;				
	e) Surveillance accessories with wired and wireless ear pieces and remote PTT; and				
	f) Skull/bone conducting microphone.				
9.12.4	*Offeror must provide a description of each accessory and identify which standard(s) each accessory has been certified for or complies with. Offeror must provide proof of certification or compliance before the solicitation period close date.*				
9.12.5	*Leather carrying cases with restraining straps must be available.*				
9.12.6	*Nylon carrying cases with restraining straps must be available.*				
9.12.7	*Carrying cases must have provision for being attached to a belt loop via a "D" clip or to a service belt via a belt clip.*				

Multi Band DVRS Radio Specifications

Article	Specifications	Compliance		Reference in Technical Bid	Bidder's Comments
		YES	NO		
9.12.8	*Portable radio accessories must include a method of attaching the radio to a carrying accessory on the operator's belt that only allows the radio to be removed from the belt when the radio is rotated into an inverted position and raised upwards (Common D-Clip).*				
10	**Mobile Radio Specific Specifications**				
10.1	General				
10.1.1	*Mobile radio must support unit-to-unit direct operation (simplex or "talk around") using either P25 Phase 1 Conventional or analog or mixed mode operation.*				
10.1.2	*Mobile radio audio speaker must be rated at a minimum of 5 Watts.*				
10.1.3	*Offeror must specify the maximum rating in Watts of the mobile radio audio speaker.*				
10.1.4	*Offeror must provide audio speaker audio distortion level at 5 Watts and at maximum rated power as per section 10.1.3 of this SOR.*				
10.1.5	*Mobile radio must have controls which are easy to understand and operate.*				
10.1.6	*Mobile radio must have a primary volume adjustment controlled via a single rotary control. For the handheld (covert) control head configuration, soft-push keys are acceptable.*				
10.1.7	*Mobile radio must have a mode/primary talkgroup selection control.*				
10.1.8	*Mobile radio must have a programmable single button press key, separate from the PTT, Emergency, volume and channel selector buttons/rotary knobs.*				
10.1.8.1	*The single press button must be located on the front of the control panel of the mobile radio; or, on the front of the remote control head panel of the mobile radio; or, on the side of the handheld (covert) control head of the mobile radio near the PTT button.*				
10.1.8.2	*The single press button must be assigned a function programmable by software.*				
10.1.8.3	*The single press button function must be programmed into the radio to permit the RTT functionality to be activated after the single press is activated.*				
10.1.8.4	*The single press button must provide mechanical feedback (i.e. click) to the user that the button has been pressed and the RTT function has been initiated.*				
10.1.8.5	*The single press button must be mechanically designed as to prevent inadvertent activation.*				

Multi Band DVRS Radio Specifications

Article	Specifications	Compliance		Reference in Technical Bid	Bidder's Comments
		YES	NO		
10.1.9	Mobile radio controls must be designed such that they can be operated while the user is wearing gloves.				
10.1.10	Mobile Radio must have a separate and distinct single button for the sole purpose of initiation of an emergency call. The emergency key must be colour coded (red) and mechanically designed to prevent inadvertent activation.				
10.1.11	Offerors must describe the ability and standard connections available which permit the mobile radio to be interfaced to intercom systems and voice recorders.				
10.2	Environmental Requirements				
10.2.1	The following provides the minimum environmental standards which must be met, unless more stringent environmental standards apply elsewhere in the SOR.				
10.2.2	Mobile Radio equipment and accessories must operate within tolerances across an ambient temperature range of at least -30°C to +60°C.				
10.2.3	Mobile Radio equipment and accessories must be IP54 rated.				
10.2.4	Radio equipment must comply with MIL-STD 810G Laboratory Test Method Low Pressure (500.5), Procedure 2;				
10.2.5	Radio equipment must comply with MIL-STD 810G Laboratory Test Method High Temperature (501.5), Procedure 1 and Procedure 2;				
10.2.6	Radio equipment must comply with MIL-STD 810G Laboratory Test Method Low Temperature (502.5) Procedure 1/C2 and Procedure 2/C1;				
10.2.7	Radio equipment must comply with MIL-STD 810G Laboratory Test Method Temperature Shock (503.5);				
10.2.8	Offeror must indicate the procedure tested for MIL-STD 810G Laboratory Test Method Temperature Shock 503.5;				
10.2.9	Radio equipment must comply with MIL-STD 810G Laboratory Test Method Solar Radiation (505.5);				
10.2.10	Offeror must indicate the procedure and parameter tested for MIL-STD 810G Laboratory Test Method Solar Radiation 505.5;				
10.2.11	Radio equipment must comply with MIL-STD 810G Laboratory Test Method Rain (506.5) Procedure 1;				
10.2.12	Radio equipment must comply with MIL-STD 810G Laboratory Test Method Humidity (507.5);				

Multi Band DVRS Radio Specifications

Article	Specifications	Compliance		Reference in Technical Bid	Bidder's Comments
		YES	NO		
10.2.13	Offeror must indicate the procedure tested for MIL-STD 810G Laboratory Test Method Humidity 507.5;				
10.2.14	Radio equipment must comply with MIL-STD 810G Laboratory Test Method Salt Fog (509.5);				
10.2.15	Radio equipment must comply with MIL-STD 810G Laboratory Test Method Dust and Sand (510.5) Procedure 1 or Procedure 2;				
10.2.16	Radio equipment must comply with MIL-STD 810G Laboratory Test Method Vibration (514.6) Category 24; and				
10.2.17	Radio equipment must comply with MIL-STD 810G Laboratory Test Method Shock (516.6) Procedure 1, Procedure 5 and Procedure 6.				
10.3	Physical Specifications				
10.3.1	Offeror must specify the following for their mobile radio(s):				
	a) Make and Model number;				
	b) Manufacturer specification sheet;				
	c) Industry Canada type approval number;				
	d) Dimensions; and				
	e) Weight.				
10.3.3	Offeror must describe their solutions for a small form-factor mobile radio which is suitable for installation in compact vehicles or motorcycles.				
10.4	P25 Air Interface				
10.4.1	Mobile radio must support P25 Phase 1 Air Interface as defined by Section 7.2 of this SOR.				
10.4.2	Mobile radio must support P25 Phase 2 Air Interface as defined by Section 7.3 of this SOR.				
10.5	Mobile Radio Component Configurations				
10.5.1	Mobile radio must be available in three mounting configurations:				
	a) (Dash-Mount) Single-component configuration allowing installation of the complete unit in or under the dashboard of a vehicle;				
	b) (Trunk-Mount) Multi component configuration, allowing installation of the main radio unit in a discreet location of the vehicle, such as in the trunk or under a seat, and location of a control head in an operational part of the vehicle. The baseline trunk mount must include the control head and all required cables and connectors; and				

Multi Band DVRS Radio Specifications

Article	Specifications	Compliance		Reference in Technical Bid	Bidder's Comments
		YES	NO		
	c) (Covert-mount) Handheld configuration which incorporates a handheld controller with integrated microphone, volume control, system select, group select, RTT, ERTT, PTT, scan control and mounted in a similar fashion to the Trunk Mount configuration as above in section 10.5.1 (b).				
10.5.2	*Offeror must fully describe all three options listed in section 10.5.1 and include capabilities and any limitations.*				
10.5.2.1	*(Dash-Mount) Single-component configuration*				
10.5.2.1.1	*Controls must be located on the front panel of the radio.*				
10.5.2.1.2	*A separate palm microphone must be included.*				
10.5.2.1.3	*A separate external speaker must be included.*				
10.5.2.2	*(Trunk-Mount or Remote Mount) Multi-component configuration*				
10.5.2.2.1	*This configuration consists of a main radio unit, separate control head, hand-held microphone, speaker enclosure and interconnected with cables, 5 m in length, terminated with locking style connectors.*				
10.5.2.2.2	*Mobile radio must be available in single and dual control head configurations.*				
10.5.2.2.3	*Control head cable connectors must be locking and shall be available in lengths of at least 5m.*				
10.5.2.2.5	*Offeror must describe dual control head operation including whether both control heads can be simultaneously active.*				
10.5.2.2.6	*In a multi-component configuration, the mobile radio programming interface location must be on the control head.*				
10.5.2.3	*(Covert) Handheld configuration*				
10.5.2.3.1	*A handheld control head with integrated microphone and external speaker with 5-metres of control cable (between control head and main radio unit) must be available for the remote mount mobile radio. This hand-held control head must provide the same functionalities as the portable radio.*				
10.6	*Antennas*				
10.6.1	*Offeror must provide a list of external vehicle mount antennas designed for the band(s) supported by their mobile radio.*				
10.7	*Visual Display and Audible Indicators*				
10.7.1	*Mobile radio must have a programmable alphanumeric display for characters with a minimum of 10 characters over one or two lines.*				

Multi Band DVRS Radio Specifications

Article	Specifications	Compliance		Reference in Technical Bid	Bidder's Comments
		YES	NO		
10.7.2	Mobile radio display must be for use in low light and bright sunlight conditions.				
10.7.3	The display must be capable of being illuminated (software programmable).				
10.7.4	The display illumination period must be programmable.				
10.7.5	The display illumination must be activated by a programmable button and must be activated when the mode, channel or zone is changed.				
10.7.6	Mobile radio user must be able to turn off all illumination, status lights and all audible indicators on radio while still able to operate the radio in a normal fashion otherwise.				
10.7.7	The functionality described in Section 10.7.6 must be configurable as enabled or disabled in the mobile radio programming configuration.				
10.7.8	The display must include an indication of the approximate radio receive signal strength (RSSI) when operating on a trunked channel.				
10.7.9	Offeror must list all indications the mobile radio display is capable of displaying.				
10.7.10	Mobile Radio must provide an audible tone to the user if the PTT is activated and the user is out of coverage or if there is no channel available (e.g., busy) when operating on a trunked system. The tone must be different for each of the no coverage and no channel system states.				
10.8	Capacity				
10.8.1	Mobile radio must have a capacity of at least 512 modes of operation (talkgroups/channels) that permit programming of various frequency channels, modes of modulation. This may allow users to select from a range of interoperability options.				
10.8.2	Offeror must specify the number of Modes of Operation (talkgroups/channels) that are available for programming.				
10.8.3	Mobile radio modes of operation must be programmable by talkgroup/channel.				
10.9	External Ports				
10.9.1	Mobile radio must include a P25 compliant data port (data peripheral interface A).				
10.9.2	Mobile radio must include an external speaker connection.				

Multi Band DVRS Radio Specifications

Article	Specifications	Compliance		Reference in Technical Bid	Bidder's Comments
		YES	NO		
10.9.3	*All cables associated must be connected and retained using fasteners or other means to ensure mechanical and electrical integrity of the connection under vibration while allowing ease of disconnection for installation and servicing. Strain relief cords or connections must be used where applicable to reduce risk of damage.*				
10.10	*Voltage Requirements*				
10.10.1	*Mobile radio must operate from vehicle negative ground, 12 volt DC power and must be fully functional with no more than 20% transmit power variation and no other performance degradation when supplied with voltages varying from 10.8 volts DC to 16 volts DC at the supply terminals.*				
10.10.2	*Many vehicles are now equipped with an auto start/stop feature to save fuel whereby when the vehicle comes to a stop (e.g. at a red light), the engine shuts down, and then restarts when the brake pedal is released. This feature often causes a momentary DC voltage drop in the vehicle electrical system while the engine is restarting. Thus:*				
10.10.2.1	*The mobile radio must be equipped with technology that prevents it from shutting down and restarting during a vehicle auto start/stop cycle.*				
10.10.2.2	*The Offeror must specify how they prevent their mobile radio from shutting down and restarting during a vehicle auto start/stop cycle.*				
10.10.2.3	*The Offeror must be able to demonstrate that their solution to preventing the mobile radio from shutting down and restarting during a vehicle auto start/stop cycle is effective on a wide range of vehicles in real-world conditions.*				
10.10.2.4	*Any momentary reduction in voltage of the mobile radio ignition sense line of 2 seconds or less (must be configurable), must not cause the radio to shut down and restart. The radio must shut down within 5 seconds of loss of power to the ignition sense line.*				
10.10.3	*There must be an ability to disable ignition sense in the radio programming software. When ignition sense is disabled, the radio will ignore the state of the ignition sense wire.*				
10.10.4	*Mobile radio must be protected, in both the on and off state, against damage resulting from:*				
	a) open or shorted antenna;				
	b) excessive or reverse input voltage; and				
	c) voltage transients.				

Multi Band DVRS Radio Specifications

Article	Specifications	Compliance		Reference in Technical Bid	Bidder's Comments
		YES	NO		
12	**P25 Digital Vehicular Repeater System Specific Requirements**				
12.1	*General*				
12.1.1	*Offeror must provide a P25 Digital Vehicular Repeater System(s) (DVRS) that supports RF communications between the DVRS portable and Digital Vehicle Repeater (DVR) equipment in the VHF band.*				
12.1.2	*Offeror must provide a P25 DVRS(s) that supports RF communications between the DVRS portable and DVR equipment in the UHF band.*				
12.1.3	*Offeror must provide a P25 DVRS(s) that supports RF communications between the DVRS portable and DVR equipment in the 700/800MHz band.*				
12.1.4	*Offeror must provide a P25 DVRS(s) that supports RF communications between the radio network and DVR equipment in the VHF band.*				
12.1.5	*Offeror must provide a P25 DVRS(s) that supports RF communications between the radio network and DVR equipment in the UHF band.*				
12.1.6	*Offeror must provide a P25 DVRS(s) that supports RF communications between the radio network and DVR equipment in the 700/800MHz band.*				
12.1.7	*The DVR System portable radio(s) must comply with Offeror's specifications in Sections 6,7,8,9 and 13 of this SOR.*				
12.1.8	*The DVR System mobile radio(s) must comply with Offeror's specifications to Sections 6,7,8,10 and 13 of this SOR.*				
12.1.9	*DVRS Digital Vehicular Repeater must meet the mobile radio environmental specifications as specified in the Mobile Radio environmental specifications section 10.2 of this SOR.*				
12.1.10	*The DVRS Digital Vehicular Repeater must meet the mobile radio power specifications specified in section 10.10 of this SOR.*				
12.1.11	*Offeror must specify the following for the DVRS Digital Vehicular Repeater equipment:* *a) Make and Model number;* *b) Manufacturer specification sheet;* *c) Innovation, Science and Economic Development Canada type approval number;* *d) Dimensions; and* *e) Weight.*				

Multi Band DVRS Radio Specifications

Article	Specifications	Compliance		Reference in Technical Bid	Bidder's Comments
		YES	NO		
12.1.12	*The physical interconnection of the Digital Vehicular Repeater and the DVRS Mobile Radio must allow side-by-side or top-bottom in-car installation.*				
12.1.13	*Interference Mitigation*				
12.1.13.1	*The Digital Vehicular Repeater System must use an automatic interference mitigation mechanism preventing more than one DVR transmitting on the same frequency, at the same time, within the same geographical location.*				
12.1.13.2	*Automatic interference mitigation mechanism must operate continuously while the DVRS DVR is in operation.*				
12.1.13.3	*Offeror must describe in detail, how the DVRS automatic mitigation mechanism functions.*				
12.1.13.4	*Offeror must state all restrictions with specific examples where the automatic mitigation mechanism might not function as designed. (i.e. if more than 6 DVRs equipped cruisers show on location, the mitigation mechanism will not be able to function as it is limited to 6 DVRs maximum.)*				
12.1.14	*Offeror must provide the necessary RF filtering equipment for in-band and cross-band operation(s) in all band(s) supported by their DVRS solution(s).*				
12.2	*Digital Vehicular Repeater System Functionality*				
12.2.1	*The DVRS must support P25 voice operation on conventional and trunked networks.*				
12.2.2	*The DVRS must support P25 data operation on Trunked networks.*				
12.2.3	*The DVRS must support P25 AES 256 bit encrypted voice traffic.*				
12.2.4	*The DVRS must support P25 encryption pass-through such that there are no decryption points between the DVRS mobile and DVRS portable.*				
12.2.5	*The DVRS must support Emergency Request To Talk as defined in Appendix A of this SOR. This includes passing the Emergency status message (EMRG_ALRM_REQ) and the Unit ID of the DVRS portable that generated the emergency condition to the radio network.*				
12.2.6	*The DVRS must support Request To Talk (RTT) as defined in Appendix A of this SOR. This includes passing the status update request (STS_UPDT_REQ) status message and the Unit ID of the DVRS portable that generated the RTT to the radio network.*				

Multi Band DVRS Radio Specifications

Article	Specifications	Compliance		Reference in Technical Bid	Bidder's Comments
		YES	NO		
12.2.7	*The DVRS must support DVRS portable radio registration/deregistration to radio network .*				
12.2.9	*The DVRS must support DVRS portable radio Inbound and Outbound Group Calls.*				
12.2.10	*The DVRS must pass onto the radio network, DVRS's portable radio Unit ID on Push To Talk.*				
12.2.11	*The DVRS must support radio unit monitor operation of DVRS portable.*				
12.2.14	*The DVRS Portable radio must generate talk permit tones when operating via DVRS on a trunking radio network.*				
12.2.15	*The DVRS Portable radio must receive Radio Check and Radio Inhibit/Uninhibit commands generated by the radio network when operating via DVRS.*				
12.2.17	*The DVRS must pass P25 TIA-102.BAJC Location Services Tier 2 GPS traffic between the DVRS portable and radio network.*				
12.2.18	*The DVRS DVR must support remote activation via an external physical trigger such as a door switch.*				
12.2.19	*The DVRS DVR must support remote activation via DVRS mobile radio control head.*				
12.2.20	*Offeror must indicate any feature differences between a radio system connected portable radio versus a DVRS DVR radio system connected DVRS portable radio.*				
12.2.21	*Offeror must identify all proprietary features for the DVRS portable radio DVRS DVR solution.*				
12.2.22	*Offeror must describe their DVRS DVR operation if the DVRS mobile radio loses radio system connectivity.*				
12.2.23	*Offeror must indicate if DVRS supports preemptive emergency voice transmission by a DVRS portable, while the DVRS DVR is actively in the process of relaying system audio from the DVRS mobile radio to connected DVRS portable radios.*				
12.2.24	*If the DVRS support preemptive emergency voice transmission, Offeror must indicate any operational conditions that may delay the priority DVRS portable from transmitting into the radio system.*				
12.2.25	*Offeror must indicate the required actions to transition from direct system operation to DVRS operation by the user of the DVRS portable radio.*				

13 Appendix A – Request To Talk Baseline Requirements

Multi Band DVRS Radio Specifications

Article	Specifications	Compliance		Reference in Technical Bid	Bidder's Comments
		YES	NO		
13.1	*Physical*				
13.1.1	*Each model of End User radio equipment (Subscriber Unit) for use by the RCMP must have a separate, readily accessible, single press button for the purpose of initiating a RTT as per signalling requirements.*				
13.1.2	*The RTT button must be functional while the keypad is locked (portable radio only).*				
13.1.4	*Each model of End User radio equipment (SU) for use by the RCMP must have a separate, readily accessible, single press button for the purpose of initiating a ERTT as per signalling requirements.*				
13.1.5	*The ERTT button must be functional while the keypad is locked (portable radio only).*				
13.1.6	*The ERTT button must have a colour different from other buttons on the unit that is suggestive of an emergency (e.g. Red or Orange).*				
13.1.7	*The ERTT button must be indented or otherwise positioned to help prevent inadvertent activation of the feature.*				
13.1.8	*The ERTT button must be pressed for a configurable duration between 0.25 and 2.0 seconds prior to activation in order to prevent inadvertent activation.*				
13.1.9	*The duration referenced in (13.1.8) must be a programmable value in the radio service software.*				
13.1.10	*Speaker Mic accessories for portable SU for use by the RCMP must have a dedicated button for initiation of an ERTT.*				
13.2	*RTT Signalling*				
13.2.1	*The RTT function must be implemented using the status control message (STS_UPDT_REQ) as defined in the most current version of Trunking Control Channel Messages, TIA-102.AABC-E.*				
13.3	*ERTT Signalling*				
13.3.1	*The Emergency RTT function must be implemented using the status control message (EMRG_ALRM_REQ) as defined in the most current version of Trunking Control Channel Messages, TIA-102.AABC-E.*				
13.4	*RTT Activation*				
13.4.1	*Upon depression of the RTT button, the SU must send a STS_UPDT_REQ according to TIA-102.AABD-B Random Access Procedures with the values as outlined below:* *a) Status value: $0100 (hex) – must be allocated to represent the RTT function*				

Multi Band DVRS Radio Specifications

Article	Specifications	Compliance		Reference in Technical Bid	Bidder's Comments
		YES	NO		
	b) The 24-bit source address: the calling SU's Unit ID				
	c) The 24-bit target address: $FF FFFC (hex), the Console Subsystem Address				
13.4.2	*Upon depression of the RTT button, the SU must start timer T(ack) awaiting an ACK_RSP_FNE from the console subsystem.*				
13.5	*ERTT Activation*				
13.5.1	*Upon depression of the Emergency ERTT button, the SU must send a status control message (EMRG_ALRM_REQ) as defined in the most current version of Trunking Control Channel Messages, TIA-102.AABC-E, with the values as outlined below:*				
	a) The 24-bit source address: the calling SU's Unit ID				
13.5.2	*Upon depression of the ERTT button, the SU must start timer Tack while awaiting an ACK_RSP_FNE from the console subsystem.*				
13.5.3	*Until the emergency state in the radio is cleared, all operations by the subscriber unit must have the emergency bit set to 1*				
13.6	*Emergency Audio Talk Path*				
13.6.1	*An ERTT button press must initiate a voice call and provide an inbound audio talk path to the Console Sub-System from the subscriber unit for a period of approximately 10 seconds. This must allow the calling party to talk to the Console immediately after the System has established the ERTT.*				
13.7	*Automatic Retries*				
13.7.1	*The number of re-try attempts for RTT transmission must be set to four (4) through the radio service software not to exceed maximum value as specified in P25 specification (N_retry).*				
13.7.2	*If the SU does not receive a system acknowledgement that the ERTT was received by the console subsystem equipment, it must continue to re-send the ERTT for a predetermined length of time or predetermined number of attempts, up to the maximum allowed under P25 specifications.*				
13.7.3	*The length of time or predetermined number of attempts for ERTT re-transmission must be adjustable through the radio service software, between the boundaries set under P25 specifications.*				
13.8	*Retry Quieting*				

Multi Band DVRS Radio Specifications

Article	Specifications	Compliance		Reference in Technical Bid	Bidder's Comments
		YES	NO		
13.8.1	*Upon receipt of a System Acknowledgement response from the System Default Address as defined below, the SU must stop sending retries.*				
	a) Message type: ACK_RSP_FNE with the values as outlined below:				
	b) Service Type: %011000 (binary), the opcode for the STS_UPDT				
	c) AIV: 1				
	d) EX: 0				
	e) Source Address: $FF FFFD (Hex), System Default as per TIA-102.AABD-B, Annex A. 5.2.2				
	f) Target Address: the calling SU's Unit ID				
13.9	*Positive Acknowledgement*				
13.9.1	*Upon receipt of a System Acknowledgement response from the Console Sub-System address as defined below, the SU must generate an audible tone indicating that the RTT was successfully received by the Console Sub-System.*				
	a) Message type: ACK_RSP_FNE with values set as outlined below:				
	b) Service Type: %011000 (binary), the opcode for the STS_UPDT				
	c) AIV: 1				
	d) EX: 0				
	e) Source Address: $FF FFFC (Hex), Console Sub-System address as per TIA-102.AABD-B, Annex A 5.2.2				
	f) Target Address: the calling SU's Unit ID				
13.9.2	*Upon receipt of a System Acknowledgement response from the Console Sub-System address, the SU must stop the T(ack) timer.*				
13.10	*Negative Acknowledgement*				
13.10.1	*Upon receipt of a DENY_RSP response message from the system as defined below or upon the expiration of the SU's T(ack) timer, the SU must generate an audible tone indicating that the RTT was unsuccessful.*				
	a) Message type: DENY_RSP with values set as outlined below:				
	b) Service Type: %011000 (binary), the opcode for the STS_UPDT				
	c) AIV: 0				
	d) EX: 0				
	e) Target Address: the calling SU's Unit ID				

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Article	Specifications	Compliance		Reference in Technical Bid	Bidder's Comments
		YES	NO		
13.10.2	*The negative acknowledgement audible tone must be different than the audible tone used for a positive RTT acknowledgement.*				
13.11	*Return to Normal Operations*				
13.11.1	*The SU must revert back to normal operation after receiving either a positive or negative acknowledgement.*				