ANNEX "F"

PROOF OF COMPLIANCE TESTING MATRIX

The Canadian Coast Guard has a test AIS environment in their laboratory in Quebec that replicates their operational system. CCG will be connecting the proposed Physical Shore Station to this test environment and verifying each requirement one by one to demonstrate that the equipment is compatible with CCG GPS antennas and network as per TSOR.

TABLE F1 – TECHNICAL EVALUATION – MANDATORY REQUIREMENTS						
TSOR Reference		***Description of Requirement***	***Procedure***	***Pass and Fail comments***	***Compliance***	
					PASS	***FAIL***
TSOR - Chapter 2 PSS Specific requirements						
M1	*2.1.1*	The AIS PSS must be a commercial off the shelf product.				
M2	*2.1.2*	The AIS PSS must be comprised of 3 main components: a) the AIS transponder or radio; b) the controller; and c) the power supply				
M3	*2.1.4*	The AIS PSS must be a certified radio for use in Canada.				
M4	*2.1.5*	The AIS PSS must include two interfaces: a) The AIS Presentation Interface (PI) as defined in International Association of Marine Aids to Navigation and Lighthouse Authorities (IALA) Recommendation A-124 (see article 1.2.3) to send and receive National Marine Electronics Association (NMEA) sentences as defines in IEC standards (see article 1.2.3). b) A Human Machine Interface (HMI), either Graphical User Interface or Command Line Interface, to perform configuration, updates, monitoring and administrative tasks.				
M5	*2.1.6*	The AIS PSS and components must be compliant with the following standards: a) ITU-R M.1371-5 Technical characteristics for an automatic identification system using time-division multiple access in the VHF				

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TSOR Reference		**Description of Requirement**	**Procedure**	**Pass and Fail comments**	**Compliance**	
					PASS	**FAIL**
		maritime mobile band. b) IEC-61162-1, Edition 5.0 and IEC-62320-1, Edition 2.0 and be capable of outputting NMEA sentences with TAG blocks “c” and “s” as defined in IEC-62320-1, 2nd edition. c) IALA Recommendation A-124 on The AIS Service Edition 2.1 and Appendices.				
M6	*2.1.7*	The AIS PSS must have a built-in self-test on power-up.				
M7	*2.1.8*	Failure of the AIS PSS equipment to output self-test statistics must be considered a fatal error and must automatically generate an alarm on the PI, using the alerting (ALR) message defined in IEC-62320-1, Edition 2.0.				
M8	*2.1.10*	The AIS PSS configuration must be stored in a non-volatile memory and the last configuration must be restored after each start or restart, planned or not.				
M9	*2.2.1*	The AIS PSS must be physically designed for mounting in a CCG supplied 19” wide rack unit, including all its components.				
M10	*2.2.2*	The AIS PSS must provide at least one RJ-45 Ethernet connector to be connected to the Operational Network which will be supplied by Canada as Government Furnished Equipment (GFE).				
M11	*2.2.3*	The AIS PSS must be available in two versions, one that supports single phase 120VAC, +10%, -15%, 60Hz +/- 1.5Hz; and one that supports –48 VDC, +25%, -10% or +12 VDC, +25%, -10%.				
M12	*2.2.4*	The AIS PSS must connect to the Global Positioning System (GPS) antenna arrangement comprising of a physical GPS antenna, cabling, filtering and protection, that will be supplied by Canada as GFE.				

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TSOR Reference		**Description of Requirement**	**Procedure**	**Pass and Fail comments**	**Compliance**	
					PASS	**FAIL**
M13	*2.2.5*	The AIS PSS must provide at least one connection to a GFE GPS antenna. The GPS antenna connection(s) must be with TNC female connector(s) available on the CCG AIS PSS.				
M14	*2.2.6*	The AIS PSS must configurable so that the position used for position reports messages (message 4) is surveyed and entered manually. In that configuration, the GPS signal must only be used to provide timing for the time division multiple access (TDMA) VHF Data Link (VDL) access.				
M15	*2.2.7*	The AIS PSS must connect to the VHF antenna arrangement comprising of a physical VHF antenna, cabling, filtering and protection, that will be supplied by Canada as GFE.				
M16	*2.2.8*	The AIS PSS must provide one connection to a VHF antenna. The VHF antenna connection must be with a type-N female connector available on the CCG AIS PSS.				
M17	*2.2.9*	The AIS PSS must operate on AIS1 (Channel 87B @ 161.975MHz) and AIS2 (Channel 88B @ 162.025 MHz) VHF channels.				
M18	*2.2.10*	The AIS PSS must have a sensitivity of at least -107dBm with a Packet Error Rate (PER) less than 20%.				
M19	*2.2.12*	The AIS PSS’s transponder must have a power output of 12.5W.				
M20	2.2.13	The AIS PSS's transponder must obtain certification from a certification body recognized by the Department of Innovation, Science and Economic Development (ISED).				

TABLE F1 – TECHNICAL EVALUATION – MANDATORY REQUIREMENTS						
TSOR Reference		**Description of Requirement**	**Procedure**	**Pass and Fail comments**	**Compliance**	
					PASS	**FAIL**
M21	2.2.14	The AIS PSS must be certified to ISED's Radio Standards Specification RSS-182, issue 6 or latest for radio transmitters and receivers for the maritime telecommunication service in the 156 – 162.5 MHz band.				
M22	*2.2.15*	The AIS PSS must comply with the radio requirements for 25 kHz Channel spacing operation given in the IEC-62320-1, Edition 2.0. However, DSC compatibility is not required				
M23	*2.2.16*	The AIS PSS must support 5 Volts GPS antennas such as Furuno GPA017S/S and Trimble bullet III or equivalents. If 5V GPS antennas are not supported by the proposed AIS PSS, a 12V GPS antenna must be included with the AIS PSS				
M24	*2.3.2*	The CCG OpNet possesses its own IP addressing scheme, naming convention, security, routing rules and Network Time Protocol infrastructure. The AIS PSS must operate using existing network services and conventions provided by the CCG OpNet				
M25	*2.3.4*	The AIS PSS Presentation Interface (PI) must be available by Ethernet for connection to the LSS via the CCG OpNet				
M26	*2.3.5*	The AIS PSS Ethernet connector type must be RJ-45 compliant with connectivity of at least 100Mbps				
M27	*2.3.6*	The AIS PSS Ethernet port configuration must be available via the configuration of the HMI				
M28	*2.4.1*	The AIS PSS PI must be used to send and received NMEA sentences as defined in IEC 61162 and IEC 62320				

TABLE F1 – TECHNICAL EVALUATION – MANDATORY REQUIREMENTS						
TSOR Reference		**Description of Requirement**	**Procedure**	**Pass and Fail comments**	**Compliance**	
					PASS	**FAIL**
M29	*2.4.2*	The AIS PSS PI must allow at least 5 concurrent persistent connections				
M30	*2.4.3*	The PI must be available by using the Telnet protocol on a TCP/IP port via the AIS PSS Ethernet connection				
M31	*2.4.4*	All NMEA sentences sent via the PI must include a time stamp containing the UNIX-time at which the message was received by the AIS PSS in the TAG block of the NMEA sentence as defined in IEC 62320				
M32	*2.4.5*	The AIS PSS must have a configurable unique identifier using the name of the site where the AIS PSS is located. This unique identifier must be at least 8 characters in length. It must be possible to configure the PSS such that its unique identifier is added to the TAG block of each and any NMEA sentence sent via the PI as defined in IEC 62320				
M33	*2.4.6*	The AIS PSS must perform a RESTART of both the AIS transponder and the controller upon reception of an appropriately configured IEC Control AIS Base Station (CAB) message containing its unique identifier in the TAG block as the destination as defined in IEC 62320				
M34	*2.4.7*	The AIS PSS restart cycle must not exceed sixty seconds from the time the station receives the CAB sentence to the time it restarts communication on the PI.				
M35	*2.4.8*	The AIS PSS must comply (using the IEC standard for testing base station, IEC 62320-1) with the following general rules regarding internal processing of AIS VDL messages and PI sentences: a. The AIS PSS must be able to receive all VDL messages; b. The AIS PSS must be able to generate and transmit any of the VDL messages 4, 6, 7, 8, 10, 12, 13, 14, 15, 16, 17, 20, 21, 22, 23, 24, 25 and 26;				

TABLE F1 – TECHNICAL EVALUATION – MANDATORY REQUIREMENTS						
TSOR Reference		**Description of Requirement**	**Procedure**	**Pass and Fail comments**	**Compliance**	
					PASS	**FAIL**
		c. The AIS PSS must not filter data. Every received VDL message must be passed to the PI as a VHF Data-Link Message (VDM) sentence with appropriately configured TAG block; d. The AIS PSS must include the feature that provides the capability to produce a VDL Signal Information sentence containing the signal strength of every received VDL message; e. Every VDM sentence received via the PI must be broadcasted on the VDL on the next available Fixed Access Time Division Multiple Access (FATDMA) reserved slot (see IEC 62320-1); f. Every Addressed Binary Message, Broadcast Binary Message and AIS Interrogation Request sentences received via the PI must be broadcasted on the VDL on the next available FATDMA reserved slot (IEC 62320-1); g. Every transmitted message on the VDL by the AIS PSS must be passed to the PI as a VHF Data-Link Own-Vessel report including a properly structured TAG block as configured; and h. The AIS PSS must include the feature that provides the capability to periodically broadcast messages 4, 17, 20, and 22				
M36	*2.4.9*	The AIS PSS must include the feature that provides the capability to set the NMEA sentence identifier of the PI so that every sentence produced by the AIS PSS starts with AIXXX as defined in IEC 61162.				
M37	*2.4.10*	The AIS PSS must include the feature that provides the capability to output, autonomously and once per minute, the ALR sentence on the PI indicating the current alarm conditions. The alarm sentence must reflect all current alarm conditions and include the TAG block appropriately configured.				
M38	*2.5.1*	The AIS PSS must include an HMI to allow unit configuration. The HMI must be either a web interface or dedicated proprietary application.				

TABLE F1 – TECHNICAL EVALUATION – MANDATORY REQUIREMENTS						
TSOR Reference		***Description of Requirement***	***Procedure***	***Pass and Fail comments***	***Compliance***	
					PASS	***FAIL***
M39	*2.5.2*	The HMI must include the feature that provides the capability to configure the AIS PSS to be monitored using SNMP.				
M40	*2.5.3*	The HMI must include the feature that provides the capability to save the entire AIS PSS configuration to file and reload the configuration from file to expedite field unit replacement.				
M41	*2.5.4*	The HMI must include the feature that provides the capability of performing AIS PSS updates or upgrades remotely via the network				

TABLE E2 – TECHNICAL EVALUATION – POINT RATED REQUIREMENTS

TSOR		Description of Requirement	Point Rating Method			Scoring comments
			Points Weight	Max Score	Offeror Score	
TSOR - Chapter 2 PSS Specific requirements						
R1	2.2.11	The bidder will be attributed points if the PSS sensitivity exceeds the minimal requirement of 20% Packet Error Rate (PER) at –107dBm.	25 pts per dBm @ 20% PER for a maximum of 275 pts for 20% PER at –118 dBm	275 points		
R2	2.5.5	The bidder will be attributed points if the AIS PSS HMI includes the feature that provides: d) the capacity to monitor real-time coverage of the station e) compute average historical coverage f) identify coverage gaps and detect reduction in coverage.	5 pts per feature.	20 points		
R3	2.5.6	The bidder will be attributed points if the AIS PSS HMI includes the feature that provides the capacity to send predictive failure indicators via SNMP.	25 pts if included	25 points		
R4	2.5.7	The bidder will be attributed points if the AIS PSS HMI includes advanced logging for troubleshooting broadcast of messages received on the PI (e.g. Messages received on PI, FATDMA broadcast of message received on PI, dropped messages, invalid messages, etc).	100 pts if included	100 points		
R5	2.5.8	The bidder will be attributed points if the AIS PSS HMI includes secured connections to its interfaces (https, SSH, SNMP V3, etc)	25 pts if all interfaces can be accessed using a secure protocol included	25 points		
R6		The bidder will be attributed points if the AIS PSS includes an integrated power supply that is swappable for AC or DC.	50 pts if included	50 points		
			Total Maximum Points:	**495**		