Volume 1, Annex D, Appendix 10

Bid Evaluation Plan
Compliance Matrix: System Requirements Document

Underwater Warfare Suite Upgrade

22 February 2017

ID		Requirement Type	Compliance Demonstration Method	Bidder's Response	Evaluation of Bidder's Response	Compliant (Y/N)
SRD-1462	Volume 1, Annex D, Appendix 10 to W8472-135462 Bid Evaluation Plan - Compliance Matrix: System Requirements Document Dated: 22 February 2017	Heading	N/A			
SRD-1463	Volume 1, Annex D, Appendix 10 Bid Evaluation Plan Compliance Matrix: System Requirements Document Underwater Warfare Suite Upgrade 22 February 2017	Heading	N/A			
SRD-1	1 INTRODUCTION	Heading	N/A			
SRD-14	1.1 Scope	Heading	N/A			
SRD-11	1.1.1 The objectives of the Underwater Warfare Suite Upgrade (UWSU) Project are to overcome the deficiencies of the current Royal Canadian Navy (RCN) Halifax-class frigate Underwater Warfare Sensor System (UWSS) for Anti-Submarine Warfare (ASW) and to regain the Class's overall maritime combat capability.	Information	N/A			
SRD-12	1.1.2 The purpose of this System Requirements Document (SRD) is to define the functional, performance, and other requirements for the UWSS that will fulfill the RCN Statement of Operation Requirement (SOR) for UWSU.	Information	N/A			
SRD-23	1.1.3 As stated in the SOR, the specific objectives of the UWSU project are:	Information	N/A			
SRD-	(a) to deliver an UWSS that will provide the Halifax-class	Information	N/A			

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24	with the sensors to provide adequate self-protection and survivability capabilities against submarines and underwater weapons;					
SRD-19	(b) to improve the detection range performance against lower noise threshold enemy targets;	Information	N/A			
SRD-25	(c) to provide operators with tactical decision aids by integrating all underwater sensors, data fusion agents and tracking algorithms that will enable operators to localize the enemy quicker and with a much greater degree of certainty;	Information	N/A			
SRD-26	(d) to provide persistent active and passive detection capabilities above and below the sonic layer, including a towed passive and low frequency active sonar (LFAS);	Information	N/A			
SRD-27	(e) to acquire a system comprised to the extent practical of Military-off-the-Shelf (MOTS) components to reduce project risk;	Information	N/A			
SRD-28	(f) to avoid tactical and technical obsolescence of the UWSS by acquiring systems that use readily available Commercial-Off-The-Shelf (COTS) components, open-architectures, and modular design concepts to allow for economical and rapid implementation of future capabilities and upgrades; and	Information	N/A			
SRD-29	(g) to provide these capabilities in both single-ship independent deployer (SSID) and task group deployment scenarios, and in both littoral and open ocean environments.	Information	N/A			
SRD-583	1.1.4 The UWSS upgrades apply to the Halifax-class frigates which have completed their mid-life refits under the Halifax Class	Information	N/A			

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	Modernization / Frigate Life Extension (HCM/FELEX) project.					
SRD-13	1.1.5 The UWSS specified in this SRD includes the ship-fitted sensor system, hardware and software, cabling and other equipment needed to meet the requirements of this SRD.	Information	N/A			
SRD-128	1.1.6 In addition to the ship-fitted UWSS, ancillary equipment including hardware, software and documentation needed to maintain and support the system, to provide Halifax-class Combat System software change management capability, to train operators and maintainers, and to provide post-mission analysis capabilities in accordance with this SRD are within scope for the UWSU project.	Information	N/A			
SRD-180	1.1.7 Classified content that will form part of this SRD are included in Appendix 2 of this SRD.	Information	N/A			
SRD-181	1.1.8 Classified parameters included in this SRD will be denoted using capitalization and enclosing "$" symbols, for example, "$VARIABLE$", and will be listed in Appendix 2 of this SRD.	Information	N/A			
SRD-15	1.2 Intended Application	Heading	N/A			
SRD-16	1.2.1 The UWSS to be fitted to the Halifax-class is intended for use in all environments to which the Class might deploy: globally in waters of widely varying temperature and salinity, from the ice edge to tropical and desert coastlines, and from the littoral to the open ocean.	Information	N/A			
SRD-17	1.2.2 The UWSS will be used:	Information	N/A			
SRD-20	(a) as an essential element of the layered ASW defence concept using a combination of organic and non-organic sensors, either at the single ship or force level, meant to deter/detect threat submarines and their weapons;	Information	N/A			

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SRD-21	(b) to contribute to the above-water maritime picture compilation in sovereignty and fishery patrols, and in surveillance and interdiction operations; and	Information	N/A			
SRD-22	(c) to contribute to submarine search and rescue operations.	Information	N/A			
SRD-18	1.2.3 The operation of the UWSS will be conducted from the Halifax-class Operations Room by up to four operators, not including the Sonar Control Supervisor, but including the Senior Hand of the Watch, co-located to allow for operator collaboration.	Information	N/A			
SRD-201	1.2.4 The Sonar Control Supervisor function as implemented under HCM/FELEX will retain its current role.	Information	N/A			
SRD-30	1.3 Constraints	Heading	N/A			
SRD-1180	1.3.1 There must be no changes to the current number of Halifax-class frigate concurrent towed systems. That is, any UWSS towed systems must be implemented as a single tow and must be able to be physically operable alongside the current towed torpedo countermeasure system, the AN/SLQ-25A Nixie.	Mandatory	D			
SRD-31	1.3.2 There must be no changes to the legacy AN/SQS-510 External Sonar Dome (Canoe) under the UWSU project with the exception that sensors may be fitted to it.	Mandatory	A			
SRD-174	1.3.3 There must be no changes to the AN/SLQ-25A Towed Torpedo Decoy under the UWSU project.	Mandatory	A			
SRD-175	1.3.4 There must be no changes to the ship under the UWSU project, whether permanent or for the purpose of mission-fit, that would have an impact on the ability of the ship to conduct helicopter flight operations.	Mandatory	A			
SRD-	1.3.5 The design and implementation of the UWSS by the Contractor	Mandatory	A			

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1448	in compliance with this SRD must preserve the material and capability state of the ship.					
SRD-2	2 APPLICABLE DOCUMENTS	Heading	N/A			
SRD-1158	2.1 Applicability	Heading	N/A			
SRD-1179	2.1.1 The following documents, standards and definitions form part of this Contract to the extent specified in the individual Annexes, Appendices and Attachments. Unless otherwise stated, the dates of issue, revision or amendment in effect for each reference must be based on those in effect as of the date of the UWSU RFP release. Wherever a specific paragraph of a document is referenced as part of a requirement, all subparagraphs of the referenced paragraph must apply, unless otherwise indicated.	Mandatory	A			
SRD-1159	2.1.2 The following documents support the SRD and must be considered as supplemental information if not specifically identified in the text. In the event of conflicts between the documents referenced below and the content of the SRD, the contents of the SRD must take precedence.	Mandatory	A			
SRD-1160	2.2 References	Heading	N/A			
SRD-1161	2.2.1 Commercial Standards	Heading	N/A			
SRD-1162	2.2.1.1 National Marine Electronics Association (NMEA) 0183 Standard for Interfacing Marine Electronic Devices Version 3.01 dated 30 January 2002	Information	N/A			
SRD-1163	2.2.2 Commercial Publications	Heading	N/A			
SRD-	2.2.2.1 World Meteorological Organization Publication Number 306	Information	N/A			

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852	Manual on Codes Volume I.1					
SRD-1164	2.2.3 Canadian Forces Specifications and Standards	Heading	N/A			
SRD-1019	2.2.3.1 A-P9-050-000/PT-001, Canadian Forces Individual Training & Education System	Information	N/A			
SRD-873	2.2.3.2 C-59-007-006/MB-001, Sonobuoy Reference Guide	Information	N/A			
SRD-1014	2.2.3.3 DAOD 5031-2, Individual Training and Education Strategic Framework	Information	N/A			
SRD-1017	2.2.3.4 NAVORD 4500-0, RCN Individual and Collective/Operational Training Policy	Information	N/A			
SRD-964	2.2.3.5 DRDC-RDDC-2015-R186; Scientific Report, 2012-Canadian Forces Anthropometric Survey (CFAS): Final Report, September 2015	Information	N/A			
SRD-857	2.2.3.6 A-PD-050-000/AG-003, Future Naval Training System Strategy (FNTSS), 2015-06	Information	N/A			
SRD-1166	2.2.3.7 Interface Design Document between the Halifax Class Navigation Data Distribution System and the Underwater Warfare Sensor System; See Note (*1)	Information	N/A			
SRD-1445	2.2.3.8 NAVORD 3470-0, Maritime Acoustic Authority	Information	N/A			
SRD-1450	2.2.3.9 INTERFACE CONTROL DOCUMENT (ICD) TUUM-6 UNDERWATER TELEPHONE FOR HALIFAX CLASS FRIGATES, 971066-B, 19 February 2015; See Note (*1)	Information	N/A			
SRD-1451	2.2.3.10 INTERFACE CONTROL DOCUMENT (ICD) MK8-F BATHYTHERMOGRAPH RECORDER RS-232 INTERFACE (COM2), 06 February 2009; See Note (*1)	Information	N/A			
SRD-1167	2.2.4 Government of Canada Publications	Heading	N/A			

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SRD-1016	2.2.4.1 CSEC ITSG-33, Communications Security Establishment Canada (CSEC) IT Security Risk Management: A Lifecycle Approach	Information	N/A			
SRD-1169	2.2.5 NATO Standards	Heading	N/A			
SRD-1013	2.2.5.1 ANEP-77, NAVAL SHIP CODE	Information	N/A			
SRD-891	2.2.5.2 ATP 1, Allied Maritime Tactical Instructions and Procedures, Chapter 9	Information	N/A			
SRD-1131	2.2.5.3 STANAG 1382 SMER (EDITION 2) - EMERGENCY SONAR BEACONS TO AID THE DETECTION AND LOCALIZATION OF DISTRESSED SUBMARINES AND THE HOMING ONTO THEM OF SUBMERGED RESCUE CRAFT	Information	N/A			
SRD-1165	2.2.6 Mil Standards	Heading	N/A			
SRD-965	2.2.6.1 MIL-HDBK-2036, PREPARATION OF ELECTRONIC EQUIPMENT SPECIFICATIONS	Information	N/A			
SRD-1007	2.2.6.2 MIL-S-901D, MILITARY SPECIFICATION: SHOCK TESTS. H.I. (HIGH-IMPACT) SHIPBOARD MACHINERY, EQUIPMENT, AND SYSTEMS, REQUIREMENTS FOR (17 MAR 1989)	Information	N/A			
SRD-1000	2.2.6.3 MIL-STD-108E, DEFINITIONS OF AND BASIC REQUIREMENTS FOR ENCLOSURES FOR ELECTRIC AND ELECTRONIC EQUIPMENT, Notice 2, 8 August 1990	Information	N/A			
SRD-1008	2.2.6.4 MIL-STD-167-1A, DEPARTMENT OF DEFENSE TEST METHOD STANDARD, MECHANICAL VIBRATIONS OF SHIPBOARD EQUIPMENT (TYPE I - ENVIRONMENTAL AND TYPE II - INTERNALLY EXCITED)	Information	N/A			
SRD-1004	2.2.6.5 MIL-STD-461F, REQUIREMENTS FOR THE CONTROL OF ELECTROMAGNETIC INTERFERENCE CHARACTERISTICS OF SUBSYSTEMS AND EQUIPMENT	Information	N/A			

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SRD-1006	2.2.6.6 MIL-STD-740-2, MILITARY STANDARD: STRUCTURE-BORNE VIBRATORY ACCELERATION MEASUREMENTS AND ACCEPTANCE CRITERIA OF SHIPBOARD EQUIPMENT (30 DEC 1986)	Information	N/A			
SRD-1001	2.2.6.7 MIL-STD-810G, DEPARTMENT OF DEFENSE TEST METHOD STANDARD, ENVIRONMENTAL ENGINEERING CONSIDERATIONS AND LABORATORY TESTS	Information	N/A			
SRD-1111	2.2.6.8 MIL-STD-1310E, MILITARY STANDARD: SHIPBOARD BONDING, GROUNDING, AND OTHER TECHNIQUES FOR ELECTROMAGNETIC COMPATIBILITY AND SAFETY (18 AUG 1987)	Information	N/A			
SRD-1010	2.2.6.9 MIL-STD-1399/301A, DEPARTMENT OF DEFENSE INTERFACE STANDARD: INTERFACE STANDARD FOR SHIPBOARD SYSTEMS SECTION 301A SHIP MOTION AND ATTITUDE (1986-07-21)	Information	N/A			
SRD-958	2.2.6.10 MIL-STD-1472F, DEPARTMENT OF DEFENSE DESIGN CRITERIA STANDARD, HUMAN ENGINEERING	Information	N/A			
SRD-1005	2.2.6.11 MIL-STD-1474E, DEPARTMENT OF DEFENSE DESIGN CRITERIA STANDARD, NOISE LIMITS	Information	N/A			
SRD-1185	2.2.7 Notes	Heading	N/A			
SRD-1186	2.2.7.1 (*1) Publication referenced for contractual completeness only. Publication will be made available by Canada only after contract award.	Information	N/A			
SRD-3	3 FUNCTIONAL AND PERFORMANCE REQUIREMENTS	Heading	N/A			
SRD-87	3.1 General Requirements	Heading	N/A			
SRD-585	3.1.1 Shipboard Systems	Heading	N/A			
SRD-584	3.1.1.1 Underwater Warfare Sensor System	Heading	N/A			

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SRD-141	3.1.1.1.1 The UWSS, comprising the ship-fitted sensor system, must include Underwater Sensor Components (USCs), an Underwater Data Management System (UDMS), Operator Workstations, and all associated cabling and interfaces necessary to meet the requirements as defined in this SRD.	Mandatory	D			
SRD-1301	3.1.1.1.2 The UWSS must be a physically separate and independent system that is connected to other systems of the Halifax-class Combat System via external interfaces.	Mandatory	D			
SRD-846	3.1.1.1.3 The UWSS must perform unrestricted operation in all environments to which Halifax-class frigates might deploy: globally in waters of widely varying temperature and salinity, from the ice edge to tropical and desert coastlines, and from the littoral to the open ocean.	Mandatory	D			
SRD-847	3.1.1.1.4 The UWSS must have a sustained full operational capability in:	Mandatory	A			
SRD-848	(a) worldwide ice-free, temperate and tropical temperatures, in all levels of humidity and precipitation, in every season;	Mandatory	A			
SRD-849	(b) an upper deck icing environment;	Mandatory	A			
SRD-850	(c) wind, waves, tides and currents found in open ocean, coastal, and littoral waters; and	Mandatory	A			
SRD-851	(d) conditions no less than the upper limit of Sea State 5.	Mandatory	A			
SRD-1449	3.1.1.1.5 The UWSS must not negatively impact the material and capability state of the ship in terms of stability, structural integrity, security, ship signatures, safety, seaworthiness and combat readiness.	Mandatory	D			
SRD-	3.1.1.2 Underwater Sensor Components	Heading	N/A			

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482						
SRD-480	3.1.1.2.1 USCs are defined as all of the hardware and software needed to perform data acquisition, including sensors, cabling, receive and transmit electronics, handling and stowage systems, firmware and software.	Information	N/A			
SRD-80	3.1.1.2.2 The UWSS must be composed of the following USCs:	Mandatory	A			
SRD-81	(a) a Hull Mounted Sonar (HMS) system to replace the legacy AN/SQS-510;	Mandatory	A			
SRD-82	(b) a Hull Mounted Torpedo Sonar Intercept (TORSIC) sensor system;	Mandatory	A			
SRD-84	(c) a Sonobuoy Processing System (SPS) to replace the legacy AN/UYS-503 system;	Mandatory	A			
SRD-83	(d) a Towed Active Passive Sonar (TAPS) system, including a TORSIC capability, to replace the legacy AN/SQR-501 CANTASS; and	Mandatory	A			
SRD-1047	(e) a Bathythermograph Recorder System, incorporating the functions of the current Mk8-F Bathythermograph Recorder.	Mandatory	A			
SRD-481	3.1.1.2.3 Some hardware and software components may be shared among the USCs.	Information	N/A			
SRD-483	3.1.1.3 Underwater Data Management System	Heading	N/A			
SRD-368	3.1.1.3.1 The UDMS, consisting of hardware and software, must serve as the centralized point of operation, control and processing for all UWSS USCs and all software functions of the UWSS.	Mandatory	D			
SRD-551	3.1.1.3.2 The UDMS, via operator workstations, must serve as the centralized point of managing, displaying and taking operator input	Mandatory	D			

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	for the UWSS Human Machine Interface (HMI).					
SRD-552	3.1.1.3.3 The UDMS must include all data collection capabilities of the UWSS, consisting of both hardware and software.	Mandatory	D			
SRD-553	3.1.1.3.4 The UDMS must perform other functions of the UWSS including:	Mandatory	A			
SRD-562	(a) onboard embedded training;	Mandatory	A			
SRD-563	(b) ownship noise monitoring; and	Mandatory	A			
SRD-564	(c) system health monitoring and diagnostics.	Mandatory	A			
SRD-88	3.1.1.3.5 The UWSS must integrate the capabilities of the UDMS and the defined USCs into a unified system in order to meet the requirements of this SRD.	Mandatory	D			
SRD-1494	3.1.1.3.6 The UDMS must process the information that is passed to the UDMS from other systems in accordance with Section 3.9.7 UDMS Interface to other Systems, as necessary in order to meet the requirements of this SRD.	Mandatory	A			
SRD-1495	3.1.1.3.7 The UDMS must display the information that is passed to the UDMS from other systems in accordance with Section 3.9.7 UDMS Interface to other Systems.	Mandatory	A			
SRD-485	3.1.1.4 Operator Workstations	Heading	N/A			
SRD-486	3.1.1.4.1 The UWSS must include no less than four (4) operator workstations in the Operations room to accommodate simultaneously no less than four (4) operators.	Mandatory	A			
SRD-554	3.1.1.5 Interfaces and Cabling	Heading	N/A			

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SRD-555	3.1.1.5.1 The UWSS must include all internal and external interfaces necessary to meet the UWSS functional and performance requirements.	Mandatory	A			
SRD-586	3.1.1.5.2 The UWSS must include all interconnecting cabling between USCs and between the UWSS and external systems to which it is interfaced to meet the UWSS functional and performance requirements.	Mandatory	A			
SRD-1248	3.1.1.6 Mounting Hardware and Racks	Heading	N/A			
SRD-1249	3.1.1.6.1 The UWSS must include all mounting hardware and racks.	Mandatory	A			
SRD-1311	3.1.1.7 Health Management	Heading	N/A			
SRD-1444	Table of UWSS Health Management Monitored Elements	Mandatory	A			
	Dynamic Parameters / **Send Parameter to CMS 330** Status / Yes Sensor deployment status (i.e. HMS up/down, tow in/out, tow cable length, scope, and horizontal layback, etc.) / Yes Sensor power status (i.e. on/off) / Yes Sensor transmit/receive modes (i.e. transmitting/receiving, active/passive, frequencies, pulse widths, etc.) / Yes Hardware power status by system, by major					

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	component, and by subcomponents					
	Software status (i.e. instantiated, loading, loaded, down, not loaded, re-loading, running, etc.)	Yes				
	Operating mode	Yes				
	Alignment - bearing, azimuth, elevation	Yes				
	User settings	No				
	Interface status	Yes				
	Location (software modules)	No				
	Performance (including degradation)	Yes				
	User Specified Thresholds	No				
	Resource Usage - storage, bandwidth, CPU cycles, memory usage, etc.	No				
	Error conditions	Yes				
	User specified events	No				
	User data - identification, user location (e.g. at which UWSS Operator Workstation), role	No				
	Reply data, plot data, target tracking data, ping scheduler, antenna data, target environment statistics, remote command bus, and system status.	Yes				
	Static Parameters					
	Purpose	No				
	Location	No				
	Configuration management data - build, release, version, NATO Stock Number, etc.	Yes				
	Schematics	No				

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	<table><tr><td>Functional block diagrams</td><td>No</td></tr><tr><td>Degradation impact – Operational</td><td>No</td></tr><tr><td>Degradation impact – Technical</td><td>No</td></tr></table>					
SRD-1312	3.1.1.7.1 The UWSS must continuously monitor, display, control, and perform diagnostics on the health of the entire UWSS, under operator control.	Mandatory	D			
SRD-1313	3.1.1.7.2 The UWSS must shutdown UWSS systems, when commanded by UWSS HM, and under operator control.	Mandatory	A			
SRD-1314	3.1.1.7.3 The UWSS must restart UWSS systems, when commanded by UWSS HM, and under operator control.	Mandatory	A			
SRD-1315	3.1.1.7.4 The UWSS Health Management (HM) must monitor and report on, at minimum, the parameters identified in the table of UWSS Health Management Monitored Elements in Section 3.1.1.7 for UWSS systems in order to facilitate UWSS Health Management.	Mandatory	D			
SRD-1316	3.1.1.7.5 The UWSS HM must continuously manage dynamic parameter information as listed in the table of UWSS Health Management Monitored Elements in Section 3.1.1.7.	Mandatory	A			
SRD-1317	3.1.1.7.6 The UWSS HM must manage static parameter information as listed in the table of UWSS Health Management Monitored Elements in Section 3.1.1.7.	Mandatory	A			
SRD-1318	3.1.1.7.7 The UWSS HM must detect all degradations and loss of UWSS capability indicated by the parameters identified in table of UWSS Health Management Monitored Elements in Section 3.1.1.7.	Mandatory	A			
SRD-1319	3.1.1.7.8 The UWSS HM must generate an alert when UWSS HM detects degradation of UWSS capability.	Mandatory	A			
SRD-	3.1.1.7.9 The UWSS HM must generate an alert when UWSS HM	Mandatory	A			

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1320	detects loss of UWSS capability.					
SRD-1321	3.1.1.7.10 The UWSS HM must recommend actions to compensate for the degradation to maintain highest level of overall possible performance.	Mandatory	A			
SRD-1322	3.1.1.7.11 The UWSS HM must ensure that the recommended actions for the degradation are not automatically implemented by UWSS HM unless the user accepts the recommended actions.	Mandatory	A			
SRD-1323	3.1.1.7.12 The UWSS HM must implement the recommended actions for the degradation when the user accepts the recommended actions.	Mandatory	A			
SRD-1324	3.1.1.7.13 The UWSS HM must cause UWSS to shutdown UWSS systems to prevent damage, under operator control.	Mandatory	A			
SRD-1325	3.1.1.7.14 The UWSS HM must maintain, monitor, report, and display a system’s availability report that includes the availability status of integrated systems, interfaces, software components, computer nodes, and hardware components, when selected by the user.	Mandatory	D			
SRD-1326	3.1.1.7.15 The UWSS HM must assist the users to assess a Time-To-Failure for UWSS systems by generating assessments for computer nodes, hardware components, interfaces, and software components by determining their current uptime and predicting for the remaining time to failure.	Mandatory	A			
SRD-1420	3.1.1.8 System Start-Up	Heading	N/A			
SRD-1442	3.1.1.8.1 Cold-Boot	Heading	N/A			
SRD-1421	3.1.1.8.1.1 A cold-boot will bring the system to a fully functional operational state. The functional operational state will be defined by	Information	N/A			

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	default configuration settings. For TAPS, the tow may be in and ready to deploy, or already deployed when performing a cold-boot. For HMS, the transducer may be up and ready to lower or already down when performing a cold-boot.					
SRD-1422	3.1.1.8.1.2 The operators and technicians may choose to perform a cold-boot for initial system flash-up or when the system is already operating, as a method of ensuring the system is booted to a clean default state. If equipment is already powered on, cold-boot will include power cycling all equipment.	Information	N/A			
SRD-1443	3.1.1.8.2 Warm-Boot	Heading	N/A			
SRD-1423	3.1.1.8.2.1 A warm-boot will bring the system to a fully functional operational state. The functional operational state will include recovery of the tactical picture and all configuration, functional, and operational settings based on what it was immediately prior to the warm-boot or immediately prior to last time the UWSS was operating. Each UWSS operator workstation will re-instate its display configuration to the last one in effect.	Information	N/A			
SRD-1424	3.1.1.8.2.2 The operators and technicians may choose to perform a warm-boot for initial system flash-up or when the system is already operating, as a method of returning the system to its last operational state. The operators and technicians may also choose to perform a warm-boot after power loss, as a method of ensuring the state of the system is re-instated as it was immediately prior to the power loss.	Information	N/A			
SRD-1425	3.1.1.8.3 Once all UWSS equipment is fully powered on from a full power off state, the UWSS must start up using either the cold-boot method or the warm-boot method as selected by the user.	Mandatory	A			

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SRD-1426	3.1.1.8.4 Once all UWSS equipment is fully powered on, the only user action to continue start-up of the UWSS must be a single user selection of the start-up method.	Mandatory	A			
SRD-1427	3.1.1.8.5 On start-up, the UWSS must display the progress of the initialization of each UWSS system.	Mandatory	A			
SRD-1428	3.1.1.8.6 From a fully powered off state, the UWSS must complete all required configuration, initialization, and flash-up of systems to a fully functional operational state, including selection and execution of cold-boot or warm-boot methods, in no more than 15 minutes.	Mandatory	A			
SRD-1429	3.1.1.8.7 Cold-Boot Method	Heading	N/A			
SRD-1430	3.1.1.8.7.1 When the cold-boot method is selected, the UWSS must initialize the systems utilizing the default configuration settings.	Mandatory	A			
SRD-1431	3.1.1.8.7.2 From a fully functional operational powered on state, selection of the cold-boot method must result in all UWSS equipment being power cycled off, re-booted and completing all required cold-boot configuration, initialization and flash-up of systems to a fully functional operational state in no more than 15 minutes.	Mandatory	A			
SRD-1432	3.1.1.8.8 Warm-Boot Method	Heading	N/A			
SRD-1433	3.1.1.8.8.1 When the warm-boot method is selected, the UWSS must initialize the systems to the last configured state immediately prior to selection of the warm-boot or immediately prior to the last time the system was operating.	Mandatory	A			
SRD-1434	3.1.1.8.8.2 From a fully functional operational powered on state, selection of the warm-boot method must result in the UWSS being re-booted and completing all required warm-boot re-configuration	Mandatory	A			

ID		Requirement Type	Compliance Demonstration Method	Bidder's Response	Evaluation of Bidder's Response	Compliant (Y/N)
	and re-initialization to a fully functional operational state in no more than 5 minutes.					
SRD-1435	3.1.1.8.8.3 When the warm-boot method is selected, the UWSS must restore the tactical picture to the last state immediately prior to warm-boot or immediately prior to the last time the system was operating.	Mandatory	A			
SRD-1436	3.1.1.8.8.4 When the warm-boot method is selected, the UWSS must restore each operator workstation in its display configuration last in effect.	Mandatory	A			
SRD-1437	3.1.1.9 System Shutdown	Heading	N/A			
SRD-1438	3.1.1.9.1 The UWSS must shutdown UWSS systems, as requested by the user.	Mandatory	A			
SRD-1439	3.1.1.9.2 The UWSS must shutdown UWSS systems, when commanded by UWSS HM.	Mandatory	A			
SRD-1440	3.1.1.9.3 During operation, the UWSS must frequently save all system data required for warm-boot, in case of inadvertent shutdown or power loss.	Mandatory	A			
SRD-1441	3.1.1.9.4 On shutdown, the UWSS must display the progress of the shutdown of each UWSS system.	Mandatory	A			
SRD-587	3.1.2 Shore Systems	Heading	N/A			
SRD-592	3.1.2.1 The UWSSs must come supplied with all necessary ancillary hardware, software and documentation, and applicable upgrades, to provide support for the UWSS, including:	Mandatory	A			
SRD-593	(a) two (2) systems for maintenance at the Fleet Maintenance Facilities in full accordance with SRD Section 3.12;	Mandatory	A			

ID		Requirement Type	Compliance Demonstration Method	Bidder's Response	Evaluation of Bidder's Response	Compliant (Y/N)
SRD-594	(b) one (1) system for Halifax-class Combat Systems software support at the Combat Systems Support Center (East) (CSSC(E)) in full accordance with SRD Section 3.13;	Mandatory	A			
SRD-598	(c) one (1) system for post mission analysis at the Acoustic Data Analysis Center (ADAC) in full accordance with SRD Section 3.11; and	Mandatory	A			
SRD-595	(d) two (2) systems for the training of maintainers at the Halifax-class Maintenance Procedures Trainers (MPT) in full accordance with SRD Section 3.10.4.	Mandatory	A			
SRD-597	3.1.2.2 The RCN's future Multi-Purpose Reconfigurable Trainer (MRT) for shore-based Operator Training is described in the Future Naval Training System Strategy, A-PD-050-000/AG-003.	Information	N/A			
SRD-596	3.1.2.3 UWSS software source code and documentation must be provided in preparation for a future adaptation for shore-based Operator Training within future MRT systems.	Mandatory	A			
SRD-1250	3.1.2.4 The UWSS must include all mounting hardware and racks.	Mandatory	A			
SRD-1461	3.1.2.5 The UWSS must meet the System Security Requirements specified in Section 4.3 of this SRD.	Mandatory	A			
SRD-86	3.2 Overall Performance Requirements	Heading	N/A			
SRD-864	3.2.1 General Performance Requirements	Heading	N/A			
SRD-655	3.2.1.1 The UWSS must provide detection, classification, localization and tracking of submarine and torpedo threats.	Mandatory	D			
SRD-867	3.2.1.2 The UWSS should provide detection, classification, and localization of mine threats.	Desirable	D			
SRD-	3.2.1.3 The detection, classification, localization and tracking of	Mandatory	D			

ID		Requirement Type	Compliance Demonstration Method	Bidder's Response	Evaluation of Bidder's Response	Compliant (Y/N)
743	these threats must be accomplished simultaneously with one and more of the USCs.					
SRD-868	3.2.1.4 The spectral self-noise and flow noise of all active and passive receive USCs must not exceed that necessary to meet the overall performance requirements of the UWSS.	Mandatory	D			
SRD-875	3.2.1.5 For the following Performance Requirements, Detection Range is defined as that range where the Signal Excess (SE) drops permanently below 0 dB. Drop-outs in SE less than 0.5 km in range extent may be ignored.	Information	N/A			
SRD-876	3.2.1.6 Signal Excess is defined as the difference in decibels between target signal/echo received sound pressure level and the sum of total noise and reverberation levels minus a Detection Threshold determined by signal processing considerations. This must be based on the use of a Detection Threshold calculated using Swerling II statistical models with Probability of Detection (P_d) = 50% and a Probability of False Alarm (Pfa) = 0.01%. The Detection Threshold must include processing gain, array gain, and quantitative HMI recognition differentials. This is only applicable outside of short-range (< 0.5 km) vertical beam pattern effects.	Information	N/A			
SRD-861	3.2.2 Performance Requirements against Submarines	Heading	N/A			
SRD-79	3.2.2.1 The UWSS must perform detection, classification, localization and tracking of submarines defined by the following characteristics:	Mandatory	D			
SRD-656	(a) an active sonar target strength of no greater than $SUB_TARGET_STRENGTH_MF_DB$ dB in the frequency range of $SUB_TARGET_STRENGTH_MF_FREQ$ Hz;	Mandatory	D			
SRD-1050	(b) an active sonar target strength of no greater than $SUB_TARGET_STRENGTH_LF_DB$ dB in the frequency	Mandatory	D			

ID		Requirement Type	Compliance Demonstration Method	Bidder's Response	Evaluation of Bidder's Response	Compliant (Y/N)
	range of $SUB_TARGET_STRENGTH_LF_FREQ$ Hz;					
SRD-658	(c) a broadband radiated noise signature of no greater than $SUB_BB_RAD_NOISE_DB$ dB re 1 µPa^2/Hz at 1 meter at all frequencies from $SUB_BB_RAD_NOISE_FMIN$ Hz to $SUB_BB_RAD_NOISE_FMAX$ Hz;	Mandatory	D			
SRD-659	(d) a narrowband radiated noise signature of no greater than $SUB_NB_RAD_NOISE_DB$ dB re 1 µPa at 1 meter at a frequency of $SUB_NB_RAD_NOISE_FREQ1$ Hz;	Mandatory	D			
SRD-1175	(e) a narrowband radiated noise signature of no greater than $SUB_NB_RAD_NOISE_DB$ dB re 1 µPa at 1 meter at a frequency of $SUB_NB_RAD_NOISE_FREQ2$ Hz; and	Mandatory	D			
SRD-660	(f) a maximum speed of MAX_SUB_SPEED knots.	Mandatory	D			
SRD-665	3.2.2.2 The UWSS must detect the above defined submarine threat at a range of no less than SUB_DETECT_RANGE km, at every bearing relative to the ship, using the definition of Detection Range as specified in paragraphs 3.2.1.5 and 3.2.1.6.	Mandatory	D			
SRD-863	3.2.2.3 The UWSS submarine Doppler estimation capabilities must accommodate submarine speeds from zero (0) to MAX_SUB_SPEED knots.	Mandatory	D			
SRD-866	3.2.2.4 The UWSS should provide software and tools for automated submarine detection with false alarm rates of no more than $UWW_AUTO_DCLT_FAR$ per hour.	Desirable	D			
SRD-89	3.2.2.5 The UWSS must provide software and tools to perform operator assist for target detection, classification, localization and tracking of these threats.	Mandatory	D			
SRD-	3.2.2.6 The UWSS should meet the above submarine detection	Desirable	D			

ID		Requirement Type	Compliance Demonstration Method	Bidder's Response	Evaluation of Bidder's Response	Compliant (Y/N)
844	requirements in all environments and under all of the conditions defined in paragraphs 3.1.1.1.3 and 3.1.1.1.4.					
SRD-744	3.2.2.7 The UWSS must meet the above submarine detection requirements while underway at all ship's speeds of 15 knots and less.	Mandatory	D			
SRD-862	3.2.3 Performance Requirements against Torpedoes	Heading	N/A			
SRD-85	3.2.3.1 The UWSS must perform detection, classification, localization and tracking of torpedoes defined by the following characteristics:	Mandatory	D			
SRD-661	(a) an active sonar target strength of no greater than $TORP_TARGET_STRENGTH_DB$ dB in the frequency range of $TORP_TARGET_STRENGTH_FREQ$ Hz;	Mandatory	D			
SRD-662	(b) a broadband radiated noise signature of no greater than $TORP_BB_RAD_NOISE_DB$ dB re 1 μPa^2/Hz at 1 meter at all frequencies from $TORP_BB_RAD_NOISE_FMIN$ Hz to $TORP_BB_RAD_NOISE_FMAX$ Hz;	Mandatory	D			
SRD-663	(c) a narrowband radiated noise signature of no greater than $TORP_NB_RAD_NOISE_DB$ dB re 1 µPa at 1 meter at a frequency of $TORP_NB_RAD_NOISE_FREQ$ Hz; and	Mandatory	D			
SRD-664	(d) a maximum speed of MAX_TORP_SPEED knots.	Mandatory	D			
SRD-666	3.2.3.2 The UWSS must detect the above defined torpedo threat at a range of no less than $TORP_DETECT_RANGE$ km, at every bearing relative to the ship, using the definition of Detection Range as specified in paragraphs 3.2.1.5 and 3.2.1.6.	Mandatory	D			
SRD-334	3.2.3.3 The UWSS torpedo Doppler estimation capabilities must accommodate torpedo speeds from zero (0) to MAX_TORP_SPEED	Mandatory	D			

ID		Requirement Type	Compliance Demonstration Method	Bidder's Response	Evaluation of Bidder's Response	Compliant (Y/N)
	knots.					
SRD-561	3.2.3.4 The UWSS should provide software and tools for automated torpedo detection with false alarm rates of no more than $UWW_AUTO_DCLT_FAR$ per hour.	Desirable	D			
SRD-1102	3.2.3.5 The UWSS automated torpedo detection must disregard the operation of the ship's echo sounder.	Mandatory	D			
SRD-853	3.2.3.6 The UWSS should meet the above torpedo detection requirements in all environments and under all of the conditions defined in paragraphs 3.1.1.1.3 and 3.1.1.1.4.	Desirable	D			
SRD-877	3.2.3.7 The UWSS must meet the above torpedo detection requirements while underway at all ship's speeds of 15 knots and less.	Mandatory	D			
SRD-1054	3.2.4 Performance Requirements against Torpedo Active Sonar	Heading	N/A			
SRD-1056	3.2.4.1 The UWSS must detect torpedo active sonar and determine the angle-of-arrival of Continuous Wave (CW) active sonar pulses with frequencies between $TORP_HOMING_SONAR_FMIN$ Hz and $TORP_HOMING_SONAR_FMAX$ Hz, with a pulse duration no less than 50 ms duration with received Sound Pressure Level no greater than 80 dB re 1 µPa to an accuracy (± 1 standard deviation) no greater than ±5° over all azimuth angles.	Mandatory	D			
SRD-1055	3.2.4.2 The UWSS should provide software and tools for automated detection of torpedo active sonar with false alarm rates of no more than $TORSIC_AUTO_DCLT_FAR$ per hour.	Desirable	D			
SRD-865	3.2.5 Performance Requirements against Mines	Heading	N/A			
SRD-667	3.2.5.1 The UWSS should provide detection and localization of moored midwater mines defined by the following characteristics:	Desirable	D			

ID		Requirement Type	Compliance Demonstration Method	Bidder's Response	Evaluation of Bidder's Response	Compliant (Y/N)
SRD-668	(a) an active sonar target strength of no greater than $MINE_TARGET_STRENGTH_DB$ dB at a frequency of $MINE_TARGET_STRENGTH_FREQ$ Hz; and	Desirable	A			
SRD-669	(b) a moored depth of $MINE_DEPTH$ m.	Desirable	A			
SRD-672	3.2.5.2 The UWSS should detect the above defined mine threat at a range of no less than $MINE_DETECT_RANGE$ meters in the forward sector of the ship no less than +/- 45 degrees relative to ship's heading, using the definition of Detection Range as specified in paragraphs 3.2.1.5 and 3.2.1.6.	Desirable	D			
SRD-674	3.2.5.3 The UWSS should provide software and tools for automated mine detection with false alarm rates of no more than $MINE_AUTO_DETECT_FAR$ occurrences per hour.	Desirable	D			
SRD-870	3.2.5.4 The UWSS should meet the above mine detection requirements in all environments and under all of the conditions defined in paragraphs 3.1.1.1.3 and 3.1.1.1.4.	Desirable	D			
SRD-878	3.2.5.5 The UWSS should meet the above mine detection requirements while underway at all ship's speeds of 6 knots and less.	Desirable	D			
SRD-1132	3.2.6 Performance Requirements for Submarine Search and Rescue	Heading	N/A			
SRD-1133	3.2.6.1 The UWSS must detect and localize the Submarine Locating Acoustic Beacon (SLAB) of Victoria-class and other NATO submarines as defined in the standard STANAG 1382 for Submarine Search-and-Rescue (SubSAR) operations.	Mandatory	D			
SRD-1134	3.2.6.2 The UWSS must meet the above SubSAR requirements without utilization of the towed systems.	Mandatory	D			
SRD-1464	3.2.7 Performance Requirements for Transient Detection	Heading	N/A			

ID		Requirement Type	Compliance Demonstration Method	Bidder's Response	Evaluation of Bidder's Response	Compliant (Y/N)
SRD-1465	3.2.7.1 The UWSS must detect and localize acoustic transients that occur in the passive frequency ranges of the USCs that comprise the UWSS.	Mandatory	D			
SRD-1478	3.2.7.2 The UWSS must provide bearing estimation to the source of detected acoustic transients consistent with the capabilities of the passive USC which made the detection.	Mandatory	D			
SRD-1466	3.2.7.3 The UWSS should provide estimates of range to the source of detected acoustic transients.	Desirable	D			
SRD-1467	3.2.8 Performance Requirements for Marine Mammal Detection	Heading	N/A			
SRD-1468	3.2.8.1 The UWSS must detect and localize Marine Mammal vocalizations that occur in the passive frequency ranges of the USCs that comprise the UWSS.	Mandatory	D			
SRD-1479	3.2.8.2 The UWSS must provide bearing estimation to the source of detected Marine Mammal vocalizations consistent with the capabilities of the passive USC which made the detection.	Mandatory	D			
SRD-1469	3.2.8.3 The UWSS should provide estimates of range to the source of detected Marine Mammal vocalizations.	Desirable	D			
SRD-90	3.3 Hull Mounted Sonar System Requirements	Heading	N/A			
SRD-233	3.3.1 General	Heading	N/A			
SRD-93	3.3.1.1 The HMS USC must include all software and hardware components necessary to meet the requirements of this SRD, including transducers, handling and stowage systems (frame and hoisting mechanisms), transmitter and receiver electronics, processing systems, interfaces and cabling.	Mandatory	D			
SRD-	3.3.1.2 The HMS USC may make use of the legacy AN/SQS-510 Single	Optional	D			

ID		Requirement Type	Compliance Demonstration Method	Bidder's Response	Evaluation of Bidder's Response	Compliant (Y/N)
95	Element Transducers (SETs).					
SRD-1306	3.3.1.3 The HMS USC must not make use of the legacy AN/SQS-510 SETs in their current state.	Mandatory	D			
SRD-1307	3.3.1.4 The legacy AN/SQS-510 SETs, if reused, must be fully refurbished or replaced with equivalents, as necessary, and successfully passed performance testing and certification in order to meet all requirements as defined in this SRD, without the need for SET performance waivers.	Mandatory	D			
SRD-96	3.3.1.5 The HMS USC may make use of the legacy AN/SQS-510 handling equipment, including hoisting mechanism.	Optional	D			
SRD-1094	3.3.1.6 The HMS USC must retain the current capability to hoist the array frame out of the C5 sonar dome.	Mandatory	D			
SRD-767	3.3.1.7 The HMS USC must implement an Underwater Telephone blanking signal during active transmissions.	Mandatory	D			
SRD-768	3.3.1.8 The HMS USC must implement active transmission inhibit that prevent active transmissions from occurring while HMS transducers are above the waterline due to ship's pitch and roll.	Mandatory	D			
SRD-772	3.3.2 HMS Passive Sonar Performance	Heading	N/A			
SRD-100	3.3.2.1 The HMS USC must perform passive sonar operation in the range $HMS_PSV_RCV_FMIN$ Hz to $HMS_PSV_RCV_FMAX$ Hz.	Mandatory	D			
SRD-771	3.3.2.2 The HMS USC must perform passive sonar operation simultaneously with HMS active sonar operation, in the intervals between active transmissions.	Mandatory	D			
SRD-1096	3.3.2.3 The HMS USC passive sonar operation must continue to operate without clipping and without saturation during active sonar transmissions by consort ships and other active sonar sources, with a received sound pressure level of $CONSORT_MAX_SPL$ dB re 1 µPa	Mandatory	D			

ID		Requirement Type	Compliance Demonstration Method	Bidder's Response	Evaluation of Bidder's Response	Compliant (Y/N)
	for all source frequencies between $HMS_PSV_RCV_FMIN$ Hz to $HMS_PSV_RCV_FMAX$ Hz.					
SRD-773	3.3.3 HMS Active Transmit Performance	Heading	N/A			
SRD-101	3.3.3.1 The HMS USC must perform active sonar transmit operation in the range HMS_XMIT_FMIN Hz to HMS_XMIT_FMAX Hz.	Mandatory	D			
SRD-698	3.3.3.2 The HMS USC active sonar transmit operation must have an on-axis Source Level of no less than $HMS_XMIT_MIN_SL$ dB re 1 µPa at 1 meter, omnidirectional in the horizontal plane.	Mandatory	D			
SRD-1051	3.3.3.3 The HMS USC active sonar transmit must have a bandwidth of no less than $HMS_XMIT_BANDWIDTH$ Hz.	Mandatory	D			
SRD-769	3.3.3.4 The HMS USC active sonar transmit power settings must perform selection by the operator from full power to -20 dB relative to full power.	Mandatory	D			
SRD-770	3.3.3.5 The HMS USC active sonar transmit power settings must be selectable by the operator in increments of no greater than 3 dB relative to the lowest power setting.	Mandatory	D			
SRD-754	3.3.3.6 The HMS USC active sonar transmit operation must implement the legacy AN/SQS-510 omni-directional, wide-directional, and narrow-directional transmission modes.	Mandatory	D			
SRD-776	3.3.3.7 The HMS USC active sonar transmit function must perform pulsed operation at full power with a duty cycle from zero (0) to $HMS_XMIT_DUTYCYCLE$ percent.	Mandatory	D			
SRD-777	3.3.3.8 The HMS USC must perform continuous full power transmission at the maximum duty cycle for no less than 120 hours without damage.	Mandatory	D			
SRD-755	3.3.3.9 The HMS USC active sonar transmit must perform pulsed operation with pulse lengths between a minimum of	Mandatory	D			

ID		Requirement Type	Compliance Demonstration Method	Bidder's Response	Evaluation of Bidder's Response	Compliant (Y/N)
	$HMS_XMIT_MIN_PULSE_LEN$ seconds and a maximum of $HMS_XMIT_MAX_PULSE_LEN$ seconds, as selected by the operator.					
SRD-756	3.3.3.10 The HMS USC active sonar transmit function must perform operator modification of pulse lengths without interruption of the transmission cycle.	Mandatory	D			
SRD-112	3.3.3.11 The HMS USC active sonar transmit must perform pulsed operation with intervals between pulses between a minimum of $HMS_XMIT_MIN_PULSE_INT$ seconds and a maximum of $HMS_XMIT_MAX_PULSE_INT$ seconds, as selected by the operator.	Mandatory	D			
SRD-757	3.3.3.12 The HMS USC active sonar transmit function must perform operator modification of pulse intervals without interruption of the transmission cycle.	Mandatory	D			
SRD-111	3.3.3.13 The HMS USC active sonar transmit function must perform single pulsed operation as selected and controlled by the operator.	Mandatory	D			
SRD-758	3.3.3.14 The waveforms of the HMS USC active sonar transmit function must be definable and selectable by the operator.	Mandatory	D			
SRD-759	3.3.3.15 The HMS USC active sonar transmit capability must include the following predefined waveforms, selectable by the operator:	Mandatory	D			
SRD-760	(a) Continuous Wave (CW);	Mandatory	D			
SRD-761	(b) Linear Frequency Modulated (FM); and	Mandatory	D			
SRD-762	(c) Hyperbolic Frequency Modulated (HFM).	Mandatory	D			
SRD-1453	3.3.3.16 The HMS USC active sonar must include the capability for the definition, transmission and processing of custom waveforms as	Mandatory	D			

ID		Requirement Type	Compliance Demonstration Method	Bidder's Response	Evaluation of Bidder's Response	Compliant (Y/N)
	developed and introduced through a controlled change process.					
SRD-763	3.3.3.17 The HMS USC active sonar transmit capability must utilize custom waveforms, under operator control.	Mandatory	D			
SRD-764	3.3.3.18 The HMS USC must define, load, and store in persistent storage no less than ten (10) operator defined waveforms, under operator control.	Mandatory	D			
SRD-765	3.3.3.19 The waveforms of the HMS USC active sonar transmit must be transmitted with and without cosine-squared amplitude shading, as selected by the operator.	Mandatory	D			
SRD-766	3.3.3.20 The HMS USC active transmit capability should support other amplitude shading formulas in addition to cosine-squared, as selected by the operator.	Desirable	D			
SRD-774	3.3.4 HMS Active Receive Performance	Heading	N/A			
SRD-775	3.3.4.1 The HMS USC must perform active sonar receive operation in the range HMS_XMIT_FMIN Hz to HMS_XMIT_FMAX Hz.	Mandatory	D			
SRD-1454	3.3.4.2 The HMS USC active sonar receive capability must process all waveforms capable of being transmitted by the HMS USC.	Mandatory	D			
SRD-1052	3.3.4.3 The HMS USC must perform active sonar receive operation with a horizontal beamwidth of no greater than $HMS_RCV_BEAM_HORIZ_MAX$ degrees.	Mandatory	D			
SRD-1053	3.3.4.4 The HMS USC must perform active sonar receive operation with a vertical beamwidth of no greater than $HMS_RCV_BEAM_VERT_MAX$ degrees.	Mandatory	D			
SRD-778	3.3.4.5 The HMS USC must have a target range accuracy of +/- 2% root-mean-square (rms) or better at ranges from zero (0) to 50 kilometers.	Mandatory	D			
SRD-	3.3.4.6 The HMS USC must have a target Doppler accuracy of +/- 2	Mandatory	D			

ID		Requirement Type	Compliance Demonstration Method	Bidder's Response	Evaluation of Bidder's Response	Compliant (Y/N)
779	knots rms or better at target speeds from zero (0) to MAX_TORP_SPEED knots.					
SRD-1105	3.3.4.7 The HMS USC active receive operation must continue to operate without clipping and without saturation during active sonar transmissions by consort ships and other active sonar sources, with a received sound pressure level of $CONSORT_MAX_SPL$ dB re 1 µPa for all source frequencies between HMS_XMIT_FMIN Hz to HMS_XMIT_FMAX Hz.	Mandatory	D			
SRD-1303	3.3.5 Underwater Telephone Interface	Heading	N/A			
SRD-1304	3.3.5.1 The HMS USC must include a hardware and software interface to the Underwater Telephone, as necessary in order to meet the requirements of this SRD.	Mandatory	D			
SRD-1305	3.3.5.2 The hardware and software interface to the Underwater Telephone must send and receive signals to the extent permitted by the “INTERFACE CONTROL DOCUMENT (ICD) TUUM-6 UNDERWATER TELEPHONE FOR HALIFAX CLASS FRIGATES”, as necessary in order to meet the requirements of this SRD.	Mandatory	D			
SRD-1496	3.3.5.3 The HMS USC must process the signals that are passed from the Underwater Telephone interface, as necessary in order to meet the requirements of this SRD.	Mandatory	A			
SRD-1497	3.3.5.4 The HMS USC must display the signals that are passed from the Underwater Telephone interface.	Mandatory	A			
SRD-97	3.4 Towed Active Passive Sonar System Requirements	Heading	N/A			
SRD-239	3.4.1 General	Heading	N/A			
SRD-	3.4.1.1 The TAPS USC must comprise all software and hardware	Mandatory	D			

ID		Requirement Type	Compliance Demonstration Method	Bidder's Response	Evaluation of Bidder's Response	Compliant (Y/N)
98	components necessary to meet the requirements of this SRD, including hydrophone arrays, preamplifiers, non-acoustic sensors, transducers, data telemetry, vibration isolation, tow cables, rope drogue, stowage and handling systems, signal generation, transmitter and receiver electronics, power supplies, interfaces and associated cabling.					
SRD-241	3.4.2 TAPS Passive Sonar Performance	Heading	N/A			
SRD-99	3.4.2.1 The TAPS USC must perform passive sonar operation in the range $TAPS_PSV_FMIN_FREQ$ Hz to $TAPS_PSV_FMAX_FREQ$ Hz.	Mandatory	D			
SRD-871	3.4.2.2 The TAPS USC should perform passive sonar operation in the range $TAPS_PSV_VLF_FMIN_FREQ$ Hz to $TAPS_PSV_VLF_FMAX_FREQ$ Hz.	Desirable	D			
SRD-613	3.4.2.3 The TAPS USC passive receive system must have a minimum of 110 dB dynamic range over the range $TAPS_PSV_FMIN_FREQ$ Hz to $TAPS_PSV_FMAX_FREQ$ Hz.	Mandatory	D			
SRD-616	3.4.2.4 The TAPS USC passive receive system must have unobstructed acoustic reception in the horizontal plane from forward end-fire to aft end-fire.	Mandatory	D			
SRD-617	3.4.2.5 The TAPS USC passive receive must have no greater than $TAPS_PSV_FMIN_BEAM$ degrees beamwidth at $TAPS_PSV_FMIN_FREQ$ Hz and no greater than $TAPS_PSV_FMAX_BEAM$ degrees beamwidth at $TAPS_PSV_FMAX_FREQ$ Hz, 90 degrees broadside to the array, where the beamwidth is defined by the -3 dB points.	Mandatory	D			
SRD-618	3.4.2.6 The TAPS USC passive receive beam side-lobes must not exceed -15 dB relative to the main lobe for all frequencies between $TAPS_PSV_FMIN_FREQ$ Hz and $TAPS_PSV_FMAX_FREQ$ Hz.	Mandatory	D			

ID		Requirement Type	Compliance Demonstration Method	Bidder's Response	Evaluation of Bidder's Response	Compliant (Y/N)
SRD-619	3.4.2.7 The TAPS USC passive sonar operation must continue to operate during active sonar transmissions by either the TAPS USC or the HMS USC.	Mandatory	D			
SRD-1024	3.4.2.8 The TAPS USC passive sonar operation should maintain tracking of targets during ship manoeuvres at all ship speeds less than $SHIP_TOW_MAX_SPEED$ knots.	Desirable	D			
SRD-626	3.4.2.9 In the event of saturation or clipping of the passive receive array by active sonar transmission, the TAPS USC passive sonar operation must return to normal operation within 25 milliseconds following the end of the transmission.	Mandatory	D			
SRD-745	3.4.2.10 The TAPS USC passive sonar operation must continue to operate without clipping and without saturation during active sonar transmissions by consort ships and other active sonar sources, with a received sound pressure level of $CONSORT_MAX_SPL$ dB re 1 µPa for all source frequencies between 1.0 KHz and 3.0 KHz.	Mandatory	D			
SRD-614	3.4.3 TAPS Active Sonar Performance	Heading	N/A			
SRD-637	3.4.3.1 Low Frequency Active Sonar Transmit	Heading	N/A			
SRD-103	3.4.3.1.1 The TAPS USC must perform LFA active sonar transmit operation in the range $TAPS_LFA_XMIT_FMIN_FREQ$ Hz to $TAPS_LFA_XMIT_FMAX_FREQ$ Hz.	Mandatory	D			
SRD-1457	3.4.3.1.2 The TAPS USC may perform active sonar transmit operation outside the range $TAPS_LFA_XMIT_FMIN_FREQ$ Hz to $TAPS_LFA_XMIT_FMAX_FREQ$ Hz.	Optional	D			
SRD-883	3.4.3.1.3 The TAPS USC LFA active transmit bandwidth must be no less than 20% of the center frequency of the transmit pulse.	Mandatory	D			
SRD-	3.4.3.1.4 The TAPS USC LFA active transmit bandwidth should be no	Desirable	D			

ID		Requirement Type	Compliance Demonstration Method	Bidder's Response	Evaluation of Bidder's Response	Compliant (Y/N)
884	less than 50% of the center frequency of the transmit pulse.					
SRD-753	3.4.3.1.5 The TAPS USC LFA active sonar transmit operation must have an on-axis Source Level of no less than $TAPS_LFA_XMIT_MIN_SL$ dB re 1 µPa at 1 meter.	Mandatory	D			
SRD-699	3.4.3.1.6 The TAPS USC LFA active sonar transmit function must meet overall LFA active sonar performance requirements at all depths 30m or greater without damage from acoustic cavitation.	Mandatory	D			
SRD-700	3.4.3.1.7 The TAPS USC LFA active sonar transmit must automatically protect against self-damage from acoustic cavitation.	Mandatory	D			
SRD-701	3.4.3.1.8 The TAPS USC LFA active sonar transmit function must perform full power transmit at depths up to 300 meters.	Mandatory	D			
SRD-710	3.4.3.1.9 The TAPS USC LFA active sonar transmit power settings must perform selection by the operator from full power to -20 dB relative to full power.	Mandatory	D			
SRD-714	3.4.3.1.10 The TAPS USC LFA active sonar transmit power settings must be selectable by the operator in increments of no greater than 3 dB relative to the lowest power setting.	Mandatory	D			
SRD-702	3.4.3.1.11 The TAPS USC LFA active sonar transmit must perform pulsed operation at full power with a duty cycle from zero (0) to $TAPS_LFA_XMIT_DUTYCYCLE$ percent.	Mandatory	D			
SRD-747	3.4.3.1.12 The TAPS USC LFA must meet overall LFA active sonar performance requirements at depths greater than 30 meters at the maximum duty cycle for no less than 120 hours without damage.	Mandatory	D			
SRD-705	3.4.3.1.13 The TAPS USC LFA active sonar transmit must perform pulsed operation with pulse lengths between a minimum of $TAPS_LFA_XMIT_MIN_PULSE_LEN$ seconds and a maximum of $TAPS_LFA_XMIT_MAX_PULSE_LEN$ seconds, as selected by the operator.	Mandatory	D			

ID		Requirement Type	Compliance Demonstration Method	Bidder's Response	Evaluation of Bidder's Response	Compliant (Y/N)
SRD-706	3.4.3.1.14 The TAPS USC LFA active sonar transmit function must perform operator modification of pulse lengths without interruption of the transmission cycle.	Mandatory	D			
SRD-707	3.4.3.1.15 The TAPS USC LFA active sonar transmit must perform pulsed operation with intervals between pulses between a minimum of $TAPS_LFA_XMIT_MIN_PULSE_INT$ seconds and a maximum of $TAPS_LFA_XMIT_MAX_PULSE_INT$ seconds, as selected by the operator.	Mandatory	D			
SRD-708	3.4.3.1.16 The TAPS USC LFA active sonar transmit function must perform operator modification of pulse intervals without interruption of the transmission cycle.	Mandatory	D			
SRD-709	3.4.3.1.17 The TAPS USC LFA active sonar transmit function must perform single pulsed operation as selected and controlled by the operator.	Mandatory	D			
SRD-703	3.4.3.1.18 The waveforms of the TAPS USC LFA active sonar transmit function must be definable and selectable by the operator.	Mandatory	D			
SRD-715	3.4.3.1.19 The TAPS USC LFA active sonar transmit capability must include the following predefined waveforms, selectable by the operator:	Mandatory	D			
SRD-716	(a) Continuous Wave (CW);	Mandatory	A			
SRD-717	(b) Linear Frequency Modulated (FM); and	Mandatory	A			
SRD-718	(c) Hyperbolic Frequency Modulated (HFM).	Mandatory	A			
SRD-1455	3.4.3.1.20 The TAPS USC LFA active sonar must include the capability for the definition, transmission and processing of custom waveforms as developed and introduced through a controlled change process.	Mandatory	D			

ID		Requirement Type	Compliance Demonstration Method	Bidder's Response	Evaluation of Bidder's Response	Compliant (Y/N)
SRD-720	3.4.3.1.21 The TAPS USC LFA active sonar transmit capability must utilize custom waveforms, under operator control.	Mandatory	D			
SRD-721	3.4.3.1.22 The TAPS USC must define, load, and store in persistent storage no less than ten (10) operator defined waveforms, under operator control.	Mandatory	D			
SRD-704	3.4.3.1.23 The waveforms of the TAPS USC LFA active sonar transmit must be transmitted with and without cosine-squared amplitude shading, as selected by the operator.	Mandatory	D			
SRD-719	3.4.3.1.24 The TAPS USC LFA active transmit capability should support other amplitude shading formulas in addition to cosine-squared, as selected by the operator.	Desirable	D			
SRD-638	3.4.3.2 Low Frequency Active Receive	Heading	N/A			
SRD-620	3.4.3.2.1 The TAPS USC must perform LFA active sonar receive operation in the range $TAPS_LFA_RCV_FMIN_FREQ$ Hz to $TAPS_LFA_RCV_FMAX_FREQ$ Hz.	Mandatory	D			
SRD-1456	3.4.3.2.2 The TAPS USC active sonar LFA receive capability must process all waveforms capable of being transmitted by the TAPS USC.	Mandatory	D			
SRD-621	3.4.3.2.3 The TAPS USC LFA active sonar receive system must have a minimum of 110 dB dynamic range over the range in the range $TAPS_LFA_RCV_FMIN_FREQ$ Hz to $TAPS_LFA_RCV_FMAX_FREQ$ Hz.	Mandatory	D			
SRD-631	3.4.3.2.4 The TAPS USC LFA active sonar receive system must have unobstructed acoustic reception in the horizontal plane from forward end-fire to aft end-fire.	Mandatory	D			
SRD-104	3.4.3.2.5 The TAPS USC LFA active sonar receive capability must be directional to provide port-starboard ambiguity resolution of no less	Mandatory	D			

ID		Requirement Type	Compliance Demonstration Method	Bidder's Response	Evaluation of Bidder's Response	Compliant (Y/N)
	than 10 dB over the range $TAPS_LFA_RCV_FMIN_FREQ$ Hz to $TAPS_LFA_RCV_FMAX_FREQ$ Hz.					
SRD-623	3.4.3.2.6 The TAPS USC LFA active receive must have no greater than $TAPS_LFA_RCV_FMIN_BEAM$ degrees beamwidth at $TAPS_LFA_RCV_FMIN_FREQ$ Hz and no greater than $TAPS_LFA_RCV_FMAX_BEAM$ degrees beamwidth at $TAPS_LFA_RCV_FMAX_FREQ$ Hz, where the beamwidth is defined by the -3 dB points.	Mandatory	D			
SRD-624	3.4.3.2.7 The TAPS USC LFA active receive beam side-lobes must not exceed -15 dB relative to the main lobe for all frequencies between $TAPS_LFA_RCV_FMIN_FREQ$ Hz to $TAPS_LFA_RCV_FMAX_FREQ$ Hz.	Mandatory	D			
SRD-625	3.4.3.2.8 The TAPS USC LFA active receive capability must have bandwidth to measure Doppler shifting for targets from zero (0) to +/- MAX_SUB_SPEED knots, corrected for ownship relative motion, where $SHIP_TOW_MAX_SPEED$ knots is the maximum ownship towing speed.	Mandatory	D			
SRD-627	3.4.3.2.9 The TAPS USC LFA active receive sonar operation must continue to operate during active sonar transmissions by either the TAPS USC or the HMS USC.	Mandatory	D			
SRD-1025	3.4.3.2.10 The TAPS USC active receive sonar operation must maintain tracking of targets during ship manoeuvres at all ship speeds less than $SHIP_TOW_MAX_SPEED$ knots.	Mandatory	D			
SRD-628	3.4.3.2.11 In the event of saturation or clipping of the LFA active receive array by active sonar transmission, the TAPS USC LFA active receive sonar operation must return to normal operation within 25 milliseconds following the end of the transmission.	Mandatory	D			
SRD-	3.4.3.2.12 The TAPS USC LFA active receive sonar operation must	Mandatory	D			

ID		Requirement Type	Compliance Demonstration Method	Bidder's Response	Evaluation of Bidder's Response	Compliant (Y/N)
746	continue to operate without clipping and without saturation during active sonar transmissions by consort ships and other active sonar sources with a received sound pressure level of $CONSORT_MAX_SPL$ dB re 1 µPa for all source frequencies between 1.0 KHz and 3.0 KHz.					
SRD-639	3.4.3.3 Medium Frequency Active Receive	Heading	N/A			
SRD-622	3.4.3.3.1 The TAPS USC should perform Medium Frequency (MF) active sonar receive operation in the range $TAPS_MF_RCV_FMIN_FREQ$ Hz to $TAPS_MF_RCV_FMAX_FREQ$ Hz for the purpose of ownship bistatic sonar operation with the HMS USC.	Desirable	D			
SRD-630	3.4.3.3.2 The TAPS USC MF active sonar receive system should have a minimum of 110 dB dynamic range over the range in the range $TAPS_MF_RCV_FMIN_FREQ$ Hz to $TAPS_MF_RCV_FMAX_FREQ$ Hz.	Desirable	D			
SRD-632	3.4.3.3.3 The TAPS USC MFA active sonar receive system should have unobstructed acoustic reception in the horizontal plane from forward end-fire to aft end-fire.	Desirable	D			
SRD-633	3.4.3.3.4 The TAPS USC MF active receive should have no greater than $TAPS_MF_RCV_FMIN_BEAM$ degrees beamwidth at $TAPS_MF_RCV_FMIN_FREQ$ Hz and no greater than $TAPS_MF_RCV_FMAX_BEAM$ degrees beamwidth at $TAPS_MF_RCV_FMAX_FREQ$ Hz, where the beamwidth is defined by the -3 dB points.	Desirable	D			
SRD-634	3.4.3.3.5 The TAPS USC MF active receive beam side-lobes should not exceed -15 dB relative to the main lobe for all frequencies between $TAPS_MF_RCV_FMIN_FREQ$ Hz and	Desirable	D			

ID		Requirement Type	Compliance Demonstration Method	Bidder's Response	Evaluation of Bidder's Response	Compliant (Y/N)
	$TAPS_MF_RCV_FMAX_FREQ$ Hz.					
SRD-635	3.4.3.3.6 The TAPS USC MF active receive sonar operation should continue to operate during active sonar transmissions by either the TAPS USC or the HMS USC.	Desirable	D			
SRD-636	3.4.3.3.7 In the event of saturation or clipping of the MF active receive array by active sonar transmission, the TAPS USC MF active receive sonar operation should return to normal operation within 25 milliseconds following the end of the transmission.	Desirable	D			
SRD-640	3.4.3.3.8 The TAPS USC MF active receive capability should have sufficient bandwidth to measure Doppler shifting for targets from zero (0) to +/- MAX_SUB_SPEED knots, corrected for ownship relative motion, where $SHIP_TOW_MAX_SPEED$ knots is the maximum ownship towing speed.	Desirable	D			
SRD-615	3.4.4 TAPS TORSIC	Heading	N/A			
SRD-105	3.4.4.1 The TAPS USC must perform TORSIC operation in the range $TORSIC_FMIN$ Hz to $TORSIC_FMAX$ Hz.	Mandatory	D			
SRD-781	3.4.4.2 The TAPS TORSIC must have a minimum of 110 dB dynamic range over the range in the range $TORSIC_FMIN$ Hz to $TORSIC_FMAX$ Hz.	Mandatory	D			
SRD-782	3.4.4.3 The TAPS TORSIC must have a maximum of 3 dB variation in receive sensitivity versus frequency over the range $TORSIC_FMIN$ Hz to $TORSIC_FMAX$ Hz.	Mandatory	D			
SRD-1058	3.4.4.4 In the frequency band $TORSIC_FMIN$ Hz to $TORSIC_FMAX$ Hz, the TAPS TORSIC must have a self-noise spectrum of no more than $TORSIC_NOISE_SPECTRUM_DB$ dB re 1 $\mu Pa^2/Hz$.	Mandatory	D			
SRD-	3.4.4.5 The TAPS TORSIC must have a maximum of 3 dB variation in	Mandatory	D			

ID		Requirement Type	Compliance Demonstration Method	Bidder's Response	Evaluation of Bidder's Response	Compliant (Y/N)
783	receive sensitivity versus azimuth over the full 360 degrees of azimuth at $TORSIC_FMIN$ Hz.					
SRD-1291	3.4.4.6 The TAPS TORSIC must provide bearing estimation with an accuracy of +/- five (5) degrees rms and a resolution of +/- 1 degree for all frequencies greater than $TORSIC_FMIN$ Hz.	Mandatory	D			
SRD-787	3.4.4.7 The TAPS TORSIC should be configured to immediately and automatically resolve port starboard ambiguity.	Desirable	D			
SRD-785	3.4.4.8 The TAPS TORSIC must continue to operate during active sonar transmissions by the TAPS USC and the HMS USC.	Mandatory	D			
SRD-786	3.4.4.9 In the event of saturation or clipping of the TAPS TORSIC by active sonar transmission, the TAPS TORSIC must return to normal operation within 1 millisecond following the end of the transmission.	Mandatory	D			
SRD-675	3.4.5 TAPS Non-Acoustic Sensors	Heading	N/A			
SRD-676	3.4.5.1 The TAPS USC must include non-acoustic sensors (NAS) as part of the towed system to measure and record the following during TAPS operation:	Mandatory	D			
SRD-678	(a) depth;	Mandatory	A			
SRD-679	(b) temperature; and	Mandatory	A			
SRD-680	(c) heading.	Mandatory	A			
SRD-712	3.4.5.2 The TAPS USC NAS must measure and record pitch and roll of the towed system as necessary to meet the requirements for operation of directional elements of the TAPS USC.	Mandatory	D			
SRD-688	3.4.5.3 The TAPS USC NAS must measure, and the UDMS must record, NAS parameters at a rate of no less than one (1) sample per	Mandatory	A			

ID		Requirement Type	Compliance Demonstration Method	Bidder's Response	Evaluation of Bidder's Response	Compliant (Y/N)
	second.					
SRD-677	3.4.5.4 The TAPS USC must include no less than two NAS, one located fore and one located aft of the TAPS acoustic sensors and transmitters.	Mandatory	D			
SRD-681	3.4.5.5 The TAPS USC NAS depth sensors must measure water depth between 0 and 500 meters.	Mandatory	D			
SRD-682	3.4.5.6 The TAPS USC NAS depth sensors must have an accuracy of +/- 1.0 meters rms and a resolution of +/- 0.1 meters.	Mandatory	D			
SRD-684	3.4.5.7 The TAPS USC NAS temperature sensors must measure water temperature between -2 degrees Celsius and +35 degrees Celsius.	Mandatory	D			
SRD-683	3.4.5.8 The TAPS USC NAS temperature sensors must have an accuracy of +/- 1.0 degrees Celsius rms and a resolution of +/- 0.1 degrees Celsius.	Mandatory	D			
SRD-685	3.4.5.9 The TAPS USC NAS temperature sensors must be thermally coupled to sea water with a time constant of no greater than 30 seconds.	Mandatory	D			
SRD-686	3.4.5.10 The TAPS USC NAS heading sensors must measure heading in degrees (Magnetic).	Mandatory	D			
SRD-687	3.4.5.11 The TAPS USC NAS heading sensors must have an accuracy of +/- 1.0 degrees (Magnetic) rms and a resolution of +/- 0.1 degrees (Magnetic).	Mandatory	D			
SRD-689	3.4.5.12 The TAPS USC NAS measurement and recording function must not be affected by the operation of the TAPS active transmit function.	Mandatory	A			
SRD-691	3.4.6 TAPS Vibration Isolation	Heading	N/A			
SRD-692	3.4.6.1 The TAPS USC may include vibration isolation to meet TAPS self-noise requirements at tow speeds of between	Optional	D			

ID		Requirement Type	Compliance Demonstration Method	Bidder's Response	Evaluation of Bidder's Response	Compliant (Y/N)
	$SHIP_TOW_MIN_SPEED$ knots and $SHIP_TOW_MAX_SPEED$ knots.					
SRD-694	3.4.7 TAPS Rope Drogue	Heading	N/A			
SRD-695	3.4.7.1 The TAPS USC may include a Rope Drogue, if necessary, at the aft end of the towed system to facilitate deployment and prevent array whipping.	Optional	D			
SRD-697	3.4.7.2 The TAPS USC Rope Drogue, if fitted, must be detachable by operators from the rest of the towed system.	Mandatory	D			
SRD-242	3.4.8 Towed System Handling, Stowage, Deployment and Retrieval	Heading	N/A			
SRD-725	3.4.8.1 The TAPS must perform full operation at tow speeds between $SHIP_TOW_MIN_SPEED$ knots and $SHIP_TOW_MAX_SPEED$ knots.	Mandatory	D			
SRD-733	3.4.8.2 The TAPS must include a Handling and Stowage system appropriate to meet the requirements of this SRD.	Mandatory	D			
SRD-240	3.4.8.3 Operator control of the deployment of the towed system will remain local to the current CANTASS Handling and Stowage compartment.	Information	N/A			
SRD-1299	3.4.8.4 The TAPS must perform deployment and retrieval operations at tow speeds between 7 knots and 12 knots.	Mandatory	D			
SRD-1097	3.4.8.5 The TAPS should perform deployment and retrieval operations at tow speeds between 7 knots and 15 knots.	Desirable	D			
SRD-748	3.4.8.6 The TAPS must perform deployment and retrieval operations to and from maximum scope without damage to the TAPS sensor and the handling system under all operational conditions in less than one hour.	Mandatory	D			
SRD-	3.4.8.7 The TAPS should perform deployment and retrieval	Desirable	D			

ID		Requirement Type	Compliance Demonstration Method	Bidder's Response	Evaluation of Bidder's Response	Compliant (Y/N)
749	operations under all operational conditions in less than 30 minutes.					
SRD-713	3.4.8.8 The TAPS USC LFA active sonar transmit must be prevented from transmission during deployment, recovery and while stowed on board ship.	Mandatory	D			
SRD-735	3.4.8.9 The TAPS USC active sonar receive capability must continue to function during deployment and recovery and while cable scope is being adjusted.	Mandatory	A			
SRD-736	3.4.8.10 The TAPS USC passive sonar receive capability must continue to function during deployment and recovery and while cable scope is being adjusted.	Mandatory	A			
SRD-690	3.4.8.11 The TAPS USC NAS measurement and recording capability must continue to function during TAPS deployment and retrieval, and while cable scope is being adjusted.	Mandatory	A			
SRD-243	3.4.8.12 The TAPS may make use of the legacy OK-410 Handling System via modification.	Optional	N/A			
SRD-722	3.4.8.13 The TAPS Handling System must include braking systems to meet the overall safety requirements for the UWSS.	Mandatory	D			
SRD-723	3.4.8.14 The TAPS Handling System must include cable cutting systems to meet the overall safety requirements for the UWSS.	Mandatory	D			
SRD-724	3.4.8.15 The TAPS Handling System must include vibration isolation between the ship and the handling system to prevent negative impacts on ship's radiated noise signature.	Mandatory	D			
SRD-1023	3.4.8.16 The TAPS Handling System must include a backup retrieval system.	Mandatory	D			
SRD-727	3.4.8.17 The TAPS towing characteristics must permit depth and layback deployment of the towed system through adjustment of ship's speed and cable scope.	Mandatory	D			
SRD-	3.4.8.18 It is not necessary that the full operational depth of the	Information	N/A			

<table>
<tr><th>ID</th><th></th><th>Requirement Type</th><th>Compliance Demonstration Method</th><th>Bidder's Response</th><th>Evaluation of Bidder's Response</th><th>Compliant (Y/N)</th></tr>
<tr><td>728</td><td>towed system be achievable at all ship speed and cable scope combinations.</td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>SRD-726</td><td>3.4.8.19 The TAPS towed system must not exceed the maximum tow depth of $TAPS_MAX_TOW_DEPTH$ meters at a constant straight-ahead tow speed of $SHIP_TOW_MIN_SPEED$ knots at the maximum cable scope.</td><td>Mandatory</td><td>D</td><td></td><td></td><td></td></tr>
<tr><td>SRD-1298</td><td>3.4.8.20 The Tow depth for the TAPS must not be shallower than the depths defined in the following table:

<table><tr><th></th><th>Sensor depth limits (m) at:</th><th></th></tr><tr><th></th><th>Cable scope</th><th>Cable scope</th></tr><tr><th>Tow Speed (knots)</th><th>1/2</th><th>Full</th></tr><tr><td>10</td><td>90</td><td>180</td></tr><tr><td>12</td><td>70</td><td>140</td></tr><tr><td>15</td><td>55</td><td>110</td></tr><tr><td>20</td><td>40</td><td>80</td></tr><tr><td>25</td><td>25</td><td>50</td></tr><tr><td>30</td><td>15</td><td>30</td></tr></table></td><td>Mandatory</td><td>D or M</td><td></td><td></td><td></td></tr>
<tr><td>SRD-145</td><td>3.4.8.21 The Tow depth for the TAPS should not be shallower than the depths defined in the following table:

<table><tr><th></th><th>Sensor depth limits (m) at:</th><th></th></tr><tr><th></th><th>Cable scope</th><th>Cable scope</th></tr><tr><th>Tow Speed (knots)</th><th>1/2</th><th>Full</th></tr><tr><td>10</td><td>100</td><td>200</td></tr></table></td><td>Desirable</td><td>D or M</td><td></td><td></td><td></td></tr>
</table>

ID		Requirement Type	Compliance Demonstration Method	Bidder's Response	Evaluation of Bidder's Response	Compliant (Y/N)
	<table><tr><td>12</td><td>80</td><td>160</td></tr><tr><td>15</td><td>60</td><td>120</td></tr><tr><td>20</td><td>45</td><td>90</td></tr><tr><td>25</td><td>30</td><td>60</td></tr><tr><td>30</td><td>20</td><td>40</td></tr></table>					
SRD-146	3.4.8.22 The ship must operate all towed sensor systems that form part of the TAPS System concurrently with the ship's Towed Torpedo Countermeasure (TTCM) system.	Mandatory	A			
SRD-1300	3.4.8.23 The risk of physical interaction between the TAPS and TTCM, and the resultant risk of damage or loss of either system, must not curtail the ability of the ship to conduct concurrent tows.	Mandatory	A			
SRD-147	3.4.8.24 Deployment and retrieval of concurrent tows may be done serially, i.e. one after the other, under normal circumstances. The order of deployment and retrieval will be such as to minimize likelihood of physical interaction between the tows. Under emergency situations, both tows may be deployed and retrieved simultaneously.	Information	N/A			
SRD-148	3.4.8.25 The concurrent tows, TTCM and TAPS, should not come into physical contact with each other under every of the operational scenarios defined above.	Desirable	A			
SRD-741	3.4.8.26 A minimum separation distance of two (2) meters at every point along either concurrent tow must be a design goal for the TAPS, at all speeds between $SHIP_TOW_MIN_SPEED$ knots and $SHIP_TOW_MAX_SPEED$ knots, and while the ship is undergoing turns of $MAX_OWNSHIP_TURNRATE$ degrees per second in either direction at the ship's maximum speed of $MAX_OWNSHIP_SPEED$ knots.	Mandatory	D			

ID		Requirement Type	Compliance Demonstration Method	Bidder's Response	Evaluation of Bidder's Response	Compliant (Y/N)
SRD-149	3.4.8.27 The TAPS must not physically come into contact with the ship's stern flap under normal circumstances while at sea and underway, during deployment and recovery and while the ship is underway at speeds between $SHIP_TOW_MIN_SPEED$ knots and $SHIP_TOW_MAX_SPEED$ knots.	Mandatory	A			
SRD-92	3.5 Hull Mounted TORSIC Requirements	Heading	N/A			
SRD-235	3.5.1 Hull Mounted TORSIC General Requirements	Heading	N/A			
SRD-102	3.5.1.1 The Hull Mounted TORSIC USC must include all software and hardware components necessary to meet the requirements of this SRD, including transducers, receiver electronics, processing systems, interfaces and cabling.	Mandatory	A			
SRD-127	3.5.1.2 The Hull Mounted TORSIC USC transducer components must not be installed on the ship's hull, but must be installed either as a modification to the HMS sonar dome, or attached to the HMS transducer frame.	Mandatory	D			
SRD-646	3.5.1.3 The Hull Mounted TORSIC USC transducer components should be installed at the greatest practical depth.	Desirable	D			
SRD-643	3.5.1.4 The Hull Mounted TORSIC USC must not interfere with the operation of the HMS USC.	Mandatory	A			
SRD-644	3.5.1.5 The Hull Mounted TORSIC USC must not interfere with the operation of the Underwater Telephone.	Mandatory	A			
SRD-645	3.5.1.6 The Hull Mounted TORSIC USC must have unobstructed reception extending from the horizontal to the nadir and 360 degrees azimuth.	Mandatory	D			
SRD-647	3.5.2 Hull Mounted TORSIC Performance Requirements	Heading	N/A			

ID		Requirement Type	Compliance Demonstration Method	Bidder's Response	Evaluation of Bidder's Response	Compliant (Y/N)
SRD-648	3.5.2.1 The Hull Mounted TORSIC USC must perform reception in the range $TORSIC_FMIN$ Hz to $TORSIC_FMAX$ Hz.	Mandatory	D			
SRD-649	3.5.2.2 The Hull Mounted TORSIC USC must have a minimum of 110 dB dynamic range over the range in the range $TORSIC_FMIN$ Hz to $TORSIC_FMAX$ Hz.	Mandatory	D			
SRD-1057	3.5.2.3 In the frequency band $TORSIC_FMIN$ Hz to $TORSIC_FMAX$ Hz, the Hull Mounted TORSIC must have a self-noise spectrum of no more than $TORSIC_NOISE_SPECTRUM_DB$ dB re 1 μPa^2/Hz.	Mandatory	D			
SRD-650	3.5.2.4 The Hull Mounted TORSIC USC must have a maximum of 3 dB variation in receive sensitivity versus frequency over the range $TORSIC_FMIN$ Hz to $TORSIC_FMAX$ Hz.	Mandatory	D			
SRD-651	3.5.2.5 The Hull Mounted TORSIC USC must have a maximum of 3 dB variation in receive sensitivity versus azimuth over the full 360 degrees of azimuth.	Mandatory	D			
SRD-652	3.5.2.6 The Hull Mounted TORSIC USC must provide bearing estimation with an accuracy of +/- five (5) degrees rms and a resolution of +/- 1 degree for all frequencies greater than $TORSIC_FMIN$ Hz.	Mandatory	D			
SRD-653	3.5.2.7 The Hull Mounted TORSIC USC must continue to operate during active sonar transmissions by the TAPS USC.	Mandatory	D			
SRD-654	3.5.2.8 In the event of saturation or clipping of the Hull Mounted TORSIC USC by active sonar transmission, the Hull Mounted TORSIC USC must return to normal operation within 1 millisecond following the end of the transmission.	Mandatory	D			
SRD-91	3.6 Sonobuoy Processing System Requirements	Heading	N/A			
SRD-	3.6.1 General	Heading	N/A			

ID		Requirement Type	Compliance Demonstration Method	Bidder's Response	Evaluation of Bidder's Response	Compliant (Y/N)
216						
SRD-94	3.6.1.1 The SPS USC must include all software and hardware components necessary to meet the requirements of this SRD, including antennas, radio frequency (RF) transmitter and receiver electronics, interfaces and cabling.	Mandatory	A			
SRD-107	3.6.1.2 As antenna placement is outside the control of the Contractor, an antenna height of 26 m above the waterline will be assumed, and that line of sight to deployed sonobuoys is unobstructed by ship's structures.	Information	N/A			
SRD-874	3.6.1.3 The SPS USC must have a range of no less than 20 km for VHF and UHF reception at Sea State 0.	Mandatory	D			
SRD-217	3.6.2 Sonobuoy Compatibility	Heading	N/A			
SRD-114	3.6.2.1 The SPS USC must be compatible with the following sonobuoys and other devices, as described in C-59-007-006/MB-001:	Mandatory	D or S			
SRD-116	(a) AN/SSQ-536G(B) Bathythermograph Transmitter Set;	Mandatory	A			
SRD-118	(b) AN/SSQ-53D(3) DIFAR;	Mandatory	A			
SRD-119	(c) AN/SSQ-553G(B) DIFAR;	Mandatory	A			
SRD-122	(d) AN/SSQ-62D DICASS;	Mandatory	A			
SRD-123	(e) AN/SSQ-62E DICASS	Mandatory	A			
SRD-124	(f) AN/SSQ-53F DIFAR;	Mandatory	A			
SRD-	(g) AN/SSQ-565 LFA; and	Mandatory	A			

ID		Requirement Type	Compliance Demonstration Method	Bidder's Response	Evaluation of Bidder's Response	Compliant (Y/N)
125						
SRD-126	(h) AN/SSQ-573 DIFAR.	Mandatory	A			
SRD-151	3.6.2.2 The SPS USC must include all components necessary to fully utilize the functionality of the above listed sonobuoys, as described in C-59-007-006/MB-001, including all required antennas, cabling, preamplifiers, receivers, transmitters, and processing systems.	Mandatory	D or S			
SRD-219	3.6.2.3 The SPS USC should support NATO and other allied nation sonobuoys.	Desirable	D or S			
SRD-230	3.6.2.4 The SPS USC must fully support Command Function Select (CFS) for all devices that support CFS.	Mandatory	D or S			
SRD-277	3.6.3 Sonobuoy Antenna, Receiver and Transmitter	Heading	N/A			
SRD-154	3.6.3.1 The SPS receiver and antenna and all associated electronics, interfaces and cabling must perform reception of the VHF frequencies as listed in C-59-007-006/MB-001.	Mandatory	D or S			
SRD-155	3.6.3.2 The SPS transmitter and antenna, and all associated electronics, interfaces and cabling must support use of UHF Command Frequencies as employed by the sonobuoys, as listed above, as applicable.	Mandatory	D or S			
SRD-130	3.6.3.3 The SPS USC must fully support UHF control of DICASS sonobuoys.	Mandatory	D or S			
SRD-752	3.6.3.4 The SPS USC must fully support receiving and processing GPS data from analog and digital sonobuoys if so equipped.	Mandatory	D or S			
SRD-750	3.6.3.5 The SPS USC receiver must provide bandwidth and phase accuracy to produce no greater than 5 degrees processor-induced rms bearing error.	Mandatory	D or S			
SRD-	3.6.3.6 The SPS USC receiver must have Phase linearity	Mandatory	D or S			

ID		Requirement Type	Compliance Demonstration Method	Bidder's Response	Evaluation of Bidder's Response	Compliant (Y/N)
1106	characteristics in order to meet the overall UWSS performance requirements for DIFAR sonobuoy processing.					
SRD-278	3.6.3.7 As available space on the upper decks and main mast of the ship is limited, the SPS USC receive and transmit capability should be implemented with a combined VHF and UHF antenna.	Desirable	D or S			
SRD-134	3.7 Bathythermograph Recorder Requirements	Heading	N/A			
SRD-985	3.7.1 The UWSS must implement the current function of the Mk8-F Bathythermograph Recorder.	Mandatory	D			
SRD-1059	3.7.2 The UWSS may incorporate all or parts of the hardware and software components of the Mk8-F Bathythermograph Recorder.	Optional	D			
SRD-986	3.7.3 The UWSS must connect directly to the recorder.	Mandatory	D			
SRD-1187	3.7.4 The UWSS must perform all Bathythermograph Recorder operations from the UWSS Operator Workstations, under operator control.	Mandatory	D			
SRD-1188	3.7.5 The UWSS must directly input all Bathythermograph information into the ARPS (Acoustic Range Prediction System), under operator control.	Mandatory	D			
SRD-140	3.8 Operator Workstations Requirements	Heading	N/A			
SRD-199	3.8.1 General	Heading	N/A			
SRD-200	3.8.1.1 The UWSS must include operator workstations, include all software and hardware components, necessary to meet the requirements of this SRD.	Mandatory	A			
SRD-519	3.8.1.2 The operator workstations must implement all displays and operator control functions as defined for the UWSS USCs and the	Mandatory	A			

ID		Requirement Type	Compliance Demonstration Method	Bidder's Response	Evaluation of Bidder's Response	Compliant (Y/N)
	functions of the UDMS.					
SRD-211	3.8.1.3 The UWSS operator workstations must be designed in accordance with Section 5.7 of MIL-STD-1472F for seated operation.	Mandatory	A			
SRD-202	3.8.1.4 The UWSS operator interface must be implemented on no less than four (4) operator workstations in the Ops Room.	Mandatory	A			
SRD-170	3.8.1.5 Each operator workstation must include at least two display surfaces of sufficient size and resolution that allows effective operator recognition differential during passive narrow band analysis.	Mandatory	D			
SRD-276	3.8.1.6 All UWSS workstations must have all display and control functions of the UWSS.	Mandatory	D			
SRD-1178	3.8.1.7 A physical separation of the UWSS operator workstations (e.g. walls or curtains) from the rest of the Operations Room must be implemented.	Mandatory	D			
SRD-205	3.8.1.8 The legacy AN/SQS-510 consoles and the two AN/SQR-501 CANTASS consoles may be refurbished in order to meet the UWSS requirement.	Optional	A			
SRD-204	3.8.1.9 Fourth Operator Workstation	Heading	N/A			
SRD-1292	3.8.1.9.1 The fourth operator workstation in the Ops Room must be implemented using the existing 3-EYE Multi-Function Workstation (MFW) for the SPS.	Mandatory	A			
SRD-1293	3.8.1.9.2 The UWSS must display and control all UWSS functionality on the left and center consoles of the 3-EYE MFW simultaneously.	Mandatory	A			
SRD-1294	3.8.1.9.3 The existing 3-EYE MFW displays may be used in order to meet the Operator Workstation requirements in Section 3.8.	Optional	A			
SRD-1295	3.8.1.9.4 The UWSS must use the existing controls on the 3-EYE MFW.	Mandatory	A			

ID		Requirement Type	Compliance Demonstration Method	Bidder's Response	Evaluation of Bidder's Response	Compliant (Y/N)
SRD-1296	3.8.1.9.5 The fourth operator workstation must allow the Operator to switch control between the UWSS and the existing 3-EYE MFW Isolated Networks third screen, using a KVM switch.	Mandatory	A			
SRD-1297	3.8.1.9.6 The existing 3-EYE MFW KVM switch may be used to switch control between UWSS and the existing 3-EYE MFW Isolated Networks screen, in order to meet the Operator Workstation requirements in Section 3.8.	Optional	A			
SRD-167	3.8.2 Operations Room Configuration	Heading	N/A			
SRD-198	3.8.2.1 The design of the UWSS Operations Room configuration must be consistent with the requirements of MIL-STD-1472F.	Mandatory	D			
SRD-960	3.8.2.2 The design of the UWSS Operations Room configuration and UWSS Operator workstations must accommodate a user population whose Anthropometric dimensions are described in the 2012-Canadian Forces Anthropometric Survey (CFAS), where:	Mandatory	A			
SRD-961	(a) the user population must include a female population described by the range from the 5th percentile to the 99th percentile of the CFAS; and	Mandatory	A			
SRD-963	(b) the user population must include a male population described by the range from the 1st percentile to the 95th percentile of the CFAS.	Mandatory	A			
SRD-214	3.8.2.3 The design of the UWSS Operations Room configuration should utilize the current footprint of the existing equipment.	Desirable	A			
SRD-215	3.8.2.4 The design of the UWSS Operations Room configuration should avoid the need to relocate existing equipment.	Desirable	A			
SRD-172	3.8.2.5 The Operations Room configuration must maximize the operating efficiency of the UWW team.	Mandatory	D			
SRD-	3.8.2.6 Each UWSS operator workstation must include seating that	Mandatory	D			

ID		Requirement Type	Compliance Demonstration Method	Bidder's Response	Evaluation of Bidder's Response	Compliant (Y/N)
458	provides suitable ergonomic features to support operator effectiveness.					
SRD-210	3.8.2.7 The seating at each operator workstation must meet safety requirements, including at a minimum seat-belts for heavy weather and manoeuvres.	Mandatory	D			
SRD-212	3.8.2.8 The SHINCOM terminals implemented at the legacy HMS, SPS, SCS and TAS Sup positions under the HCM/FELEX Project must be retained for the UWSS operators.	Mandatory	A			
SRD-213	3.8.2.9 The locations of the SHINCOM terminals for UWSS operators may be reconfigured to meet the functional requirements of the UWSS in the Ops Room.	Optional	D			
SRD-132	3.9 Underwater Data Management System Requirements	Heading	N/A			
SRD-185	3.9.1 General	Heading	N/A			
SRD-133	3.9.1.1 The UDMS must include all software and hardware components necessary to meet the requirements of this SRD, including processing systems, mass storage systems, interfaces and cabling.	Mandatory	D			
SRD-194	3.9.1.2 The UDMS must provide tools for operator assisted classification of threats.	Mandatory	D			
SRD-182	3.9.1.3 The UDMS must provide operator and automated control of all USCs.	Mandatory	D			
SRD-183	3.9.1.4 The UDMS must process, display and record all data from all USCs, both acoustic and non-acoustic.	Mandatory	D			
SRD-316	3.9.1.5 The UDMS must display and record all data received from interfaces with external systems.	Mandatory	D			
SRD-	3.9.1.6 The UDMS must create and maintain the Recognized Sub-	Mandatory	D			

ID		Requirement Type	Compliance Demonstration Method	Bidder's Response	Evaluation of Bidder's Response	Compliant (Y/N)
184	Surface Picture (RSSP).					
SRD-161	3.9.2 Processing General Requirements	Heading	N/A			
SRD-856	3.9.2.1 The UDMS must provide all of the necessary sonar processing functions in order to contribute to meeting the overall performance requirements of the UWSS.	Mandatory	D			
SRD-460	3.9.2.2 General Passive Sonar Processing Requirements	Heading	N/A			
SRD-903	3.9.2.2.1 The following General Passive Sonar Processing requirements must be met by the HMS USC, the TAPS USC, and the SPS USC.	Mandatory	D			
SRD-333	3.9.2.2.2 The UDMS must perform all necessary passive sonar processing, including beamforming, narrowband, broadband and DEMON processing, in order to meet the overall performance requirements of the UWSS.	Mandatory	D			
SRD-898	3.9.2.2.3 The UDMS must have no less than ten (10) simultaneous narrowband passive sonar processing settings for bandwidth, frequency resolution and update rate for each passive sonar USC.	Mandatory	D			
SRD-487	3.9.2.3 General Active Sonar Processing Requirements	Heading	N/A			
SRD-904	3.9.2.3.1 The following General Active Sonar Processing requirements must be met by the HMS USC, the TAPS USC, and the SPS USC.	Mandatory	D			
SRD-899	3.9.2.3.2 The UDMS must perform all necessary active sonar processing, including beamforming, matched filtering, estimation of Doppler shift, and sub-beamwidth fine bearing estimation, in order to meet the overall performance requirements of the UWSS.	Mandatory	D			
SRD-	3.9.2.3.3 The HMS USC must perform 360 degree azimuthal active	Mandatory	D			

ID		Requirement Type	Compliance Demonstration Method	Bidder's Response	Evaluation of Bidder's Response	Compliant (Y/N)
879	search coverage of no less than once per minute for all targets at ranges no less than 25 kilometers.					
SRD-880	3.9.2.3.4 The TAPS USC must perform 360 degree azimuthal active search coverage of no less than once per minute for all targets at ranges no less than 25 kilometers.	Mandatory	D			
SRD-237	3.9.2.3.5 The UDMS must generate ping transmission messages for active sonar USCs to alert other UWSS USCs and processes of the start of transmission.	Mandatory	A			
SRD-521	3.9.2.4 General TORSIC Processing Requirements	Heading	N/A			
SRD-905	3.9.2.4.1 The following General TORSIC Processing requirements must be met by the Hull Mounted TORSIC USC, and the TAPS USC.	Mandatory	D			
SRD-908	3.9.2.4.2 The UDMS must perform processing to fully utilize the capabilities of the TAPS USC TORSIC as defined in paragraph 3.4 and the Hull Mounted TORSIC USC as defined in paragraph 3.5.	Mandatory	D			
SRD-789	3.9.2.4.3 The TAPS TORSIC and the Hull Mounted TORSIC must share the same TORSIC processing functions, implemented by the UDMS.	Mandatory	D			
SRD-790	3.9.2.4.4 The following requirements must be met by the TAPS TORSIC only if the TAPS is deployed.	Mandatory	A			
SRD-788	3.9.2.4.5 The UDMS TORSIC processing must perform automated and continuous detection and classification of torpedo HF active sonar transmissions.	Mandatory	A			
SRD-791	3.9.2.4.6 The UDMS TORSIC processing must continue to function in the presence of ownship active sonar transmissions and the towed torpedo decoy, and in the vicinity of operating expendable torpedo countermeasures.	Mandatory	A			
SRD-792	3.9.2.4.7 The UDMS must define TORSIC alert criteria that include detection and classification parameters, under operator control.	Mandatory	A			

ID		Requirement Type	Compliance Demonstration Method	Bidder's Response	Evaluation of Bidder's Response	Compliant (Y/N)
SRD-798	3.9.2.4.8 The UDMS must perform automated detection of the operation of the AN/SLQ-25A TTCM and every expendable acoustic countermeasures.	Mandatory	A			
SRD-800	3.9.2.4.9 The UDMS must perform automated detection of the operation of Underwater Telephones and Emergency Locator signals.	Mandatory	A			
SRD-794	3.9.2.4.10 The UDMS must raise an alert automatically when criteria are met.	Mandatory	A			
SRD-810	3.9.2.4.11 The UDMS must inhibit alerts that are automatically attributed to transmissions whose source is known, as selected by the operator.	Mandatory	A			
SRD-1177	3.9.2.4.12 The UDMS must allow alerts that are automatically attributed to transmissions whose source is known, as selected by the operator.	Mandatory	A			
SRD-900	3.9.2.5 Hull Mounted Sonar Processing	Heading	N/A			
SRD-901	3.9.2.5.1 The UDMS processing must fully utilize all of the capabilities of the HMS USC, as defined in paragraph 3.3.	Mandatory	D			
SRD-580	3.9.2.6 TAPS Processing	Heading	N/A			
SRD-902	3.9.2.6.1 The UDMS processing must fully utilize all of the capabilities of the TAPS USC, as defined in paragraph 3.4.	Mandatory	D			
SRD-581	3.9.2.6.2 The UDMS must provide automated and operator assisted tools for port-starboard ambiguity resolution of the TAPS USC omnidirectional passive array.	Mandatory	D			
SRD-218	3.9.2.7 Sonobuoy Processing	Heading	N/A			
SRD-	3.9.2.7.1 The UDMS processing must fully utilize all of the	Mandatory	D			

ID		Requirement Type	Compliance Demonstration Method	Bidder's Response	Evaluation of Bidder's Response	Compliant (Y/N)
907	capabilities of the SPS USC, as defined in paragraph 3.6.					
SRD-152	3.9.2.7.2 For sonobuoy processing, the UDMS must:	Mandatory	D or S			
SRD-115	(a) receive and process simultaneously a minimum of twenty-four (24) different sonobuoys;	Mandatory	D or S			
SRD-538	(b) interact with no less than 16 separate sonobuoy channels simultaneously, under operator control;	Mandatory	D or S			
SRD-539	(c) automatically scan all sonobuoy RF channels to determine the presence of new sonobuoys;	Mandatory	D or S			
SRD-540	(d) notify the operator of the presence of new sonobuoys, and the loss (dropout) of previously acquired sonobuoy telemetry; and	Mandatory	D or S			
SRD-541	(e) provide automated tools to allocate new sonobuoy telemetry to open receiver channels.	Mandatory	D or S			
SRD-543	3.9.2.7.3 The UDMS should receive and process simultaneously more than twenty-four (24) different sonobuoys.	Desirable	D or S			
SRD-751	3.9.2.7.4 The UDMS must have no greater than +/- 1% error in range (assuming correct sound speed profile) and no greater than +/- 10% error in estimated target Doppler.	Mandatory	D or S			
SRD-280	3.9.2.7.5 The UDMS must perform sonobuoy-based bistatic and multistatic operations.	Mandatory	D or S			
SRD-281	3.9.2.7.6 The UDMS bistatic operation must control a sonobuoy field consisting of one (1) active sonobuoy and no less than three (3) receiver sonobuoys.	Mandatory	D or S			
SRD-550	3.9.2.7.7 The UDMS multistatic operation must control a sonobuoy field consisting of no less than four (4) active sonobuoys and no less than twelve (12) receiver sonobuoys.	Mandatory	D or S			
SRD-	3.9.2.7.8 The UDMS should provide tools to generate and to acquire	Desirable	D or S			

ID		Requirement Type	Compliance Demonstration Method	Bidder's Response	Evaluation of Bidder's Response	Compliant (Y/N)
556	and utilize active source transmission coordination information, including frequencies, pulse lengths and ping schedules from and for other task group units for sonobuoy multistatic processing.					
SRD-557	3.9.2.7.9 The UDMS must utilize predefined matched filters for all active sonobuoys as described in C-59-007-006/MB-001.	Mandatory	D or S			
SRD-558	3.9.2.7.10 The UDMS should utilize predefined matched filters for NATO and allied active sonobuoys.	Desirable	D or S			
SRD-572	3.9.3 Detection and Tracking	Heading	N/A			
SRD-573	3.9.3.1 The UDMS must automatically detect and track passive broadband and narrowband contacts.	Mandatory	D			
SRD-575	3.9.3.2 The UDMS must automatically detect and track monostatic active contacts.	Mandatory	D			
SRD-576	3.9.3.3 The UDMS must automatically detect and track sonobuoy-based bistatic and multistatic active contacts.	Mandatory	D			
SRD-577	3.9.3.4 The UDMS should automatically detect and track other ownship bistatic, bistatic and multistatic active contacts.	Desirable	D			
SRD-578	3.9.3.5 The UDMS must enable and disable automatic detector-follower tools on all USCs, under operator control.	Mandatory	D			
SRD-579	3.9.3.6 The UDMS must initiate tracking of contacts not detected by the UDMS automatically, under operator control.	Mandatory	D			
SRD-1104	3.9.3.7 The UDMS must track no less than $UDMS_MAX_CONTACTS$ simultaneous contacts.	Mandatory	D			
SRD-369	3.9.4 Contact Identification and Classification	Heading	N/A			
SRD-370	3.9.4.1 The UDMS must identify Contacts detected as: (a) underwater Contacts; and (b) surface Contacts.	Mandatory	A			

ID		Requirement Type	Compliance Demonstration Method	Bidder's Response	Evaluation of Bidder's Response	Compliant (Y/N)
SRD-372	3.9.4.2 The UDMS must classify underwater Contacts in accordance with "ATP 1, Allied Maritime Tactical Instructions and Procedures", Chapter 9.	Mandatory	A			
SRD-418	3.9.4.3 The UDMS must include a Threat Force Database System (TFDS) to store, retrieve, modify and display acoustic signatures for the purpose of contact identification and classification.	Mandatory	D			
SRD-419	3.9.4.4 The TFDS must be stored on removable media that allows ship's staff to perform updates.	Mandatory	A			
SRD-420	3.9.4.5 The TFDS must include narrowband frequencies with predominant artifacts, broadband frequency ranges, transient behaviour and pictorial information.	Mandatory	A			
SRD-796	3.9.4.6 The TFDS must include active sonar information for threat and allied torpedoes, and for threat and allied active sonars.	Mandatory	A			
SRD-571	3.9.4.7 The UDMS should perform automated detection, identification and classification to the extent that alerts are raised for operators, after which, operators may assess the detection and raise alarms as appropriate.	Desirable	D			
SRD-565	3.9.5 Bistatic and Multistatic Sonar	Heading	N/A			
SRD-909	3.9.5.1 The UDMS must provide all of the necessary bistatic and multistatic processing functions necessary in order to contribute to meeting the overall performance requirements of the UWSS.	Mandatory	D			
SRD-566	3.9.5.2 The UDMS must provide sonobuoy-based bistatic and multistatic processing functions.	Mandatory	D			
SRD-567	3.9.5.3 The UDMS should provide ownship bistatic processing functions utilizing the HMS USC functioning as an emitter and the TAPS USC functioning as a receiver.	Desirable	D			
SRD-	3.9.5.4 The UDMS should provide bistatic processing functions	Desirable	D			

ID		Requirement Type	Compliance Demonstration Method	Bidder's Response	Evaluation of Bidder's Response	Compliant (Y/N)
892	utilizing sonobuoys functioning as emitters and the TAPS USC functioning as a receiver.					
SRD-569	3.9.5.5 The UDMS should provide non-cooperative bistatic processing functions utilizing the organic maritime helicopter HELRAS dipping sonar functioning as an emitter and the TAPS USC functioning as a receiver.	Desirable	D			
SRD-568	3.9.5.6 The UDMS should provide non-cooperative bistatic processing functions utilizing the active sonar of other task group units functioning as emitters and the TAPS USC functioning as a receiver.	Desirable	D			
SRD-337	3.9.6 Data Fusion	Heading	N/A			
SRD-910	3.9.6.1 The UDMS must provide all of the necessary Data Fusion processing functions necessary in order to contribute to meeting the overall performance requirements of the UWSS.	Mandatory	D			
SRD-338	3.9.6.2 The UDMS must generate Fused Tracks from all available information, by automatic and operator assisted correlation of data originating from:	Mandatory	D			
SRD-339	(a) all UWSS USCs, including the TAPS, HMS, SPS and TORSIC;	Mandatory	A			
SRD-340	(b) non-UWSS organic sensors as communicated to the UDMS by the Combat Management System; and	Mandatory	A			
SRD-341	(c) non-organic information from other units, communicated to the UDMS by the Combat Management System.	Mandatory	A			
SRD-342	3.9.6.3 The UDMS must automatically associate with a single contact every broadband and narrowband contacts on the same bearing exhibiting similar kinematics and similar acoustic characteristics.	Mandatory	D			

ID		Requirement Type	Compliance Demonstration Method	Bidder's Response	Evaluation of Bidder's Response	Compliant (Y/N)
SRD-574	3.9.6.4 The UDMS must use Fused Tracks to build and maintain a single common RSSP.	Mandatory	D			
SRD-371	3.9.6.5 The UDMS must automatically attempt to associate every new passive and active contact classified as a torpedo	Mandatory	D			
SRD-186	3.9.7 UDMS Interfaces to other Systems	Heading	N/A			
SRD-1113	3.9.7.1 Combat Management System 330 (CMS 330)	Heading	N/A			
SRD-135	3.9.7.1.1 The UDMS must include a hardware and software Internet Protocol based interface to the CMS 330, as necessary in order to meet the requirements of this SRD.	Mandatory	D			
SRD-177	3.9.7.1.2 The hardware and software interface to the CMS 330 must pass the following information from the UDMS to CMS 330:	Mandatory	D			
SRD-178	(a) UWSS system status information, including but not limited to, towed sensor deployment status (as currently implemented in CMS 330);	Mandatory	A			
SRD-179	(b) contact bearing, range, course and speed information for the conduct of TMA;	Mandatory	A			
SRD-378	(c) ASW and torpedo related alerts;	Mandatory	A			
SRD-292	(d) acoustic range prediction system information;	Mandatory	A			
SRD-377	(e) towed sensor deployment status, including depth, cable scope, and horizontal layback;	Mandatory	A			
SRD-293	(f) bathymetric information;	Mandatory	A			
SRD-294	(g) SPS sonobuoy data (non-acoustic);	Mandatory	A			

ID		Requirement Type	Compliance Demonstration Method	Bidder's Response	Evaluation of Bidder's Response	Compliant (Y/N)
SRD-295	(h) ping schedule information for all UWSS active sonar USCs;	Mandatory	A			
SRD-296	(i) the RSSP;	Mandatory	A			
SRD-1308	(j) interface status and control information for all UWSS component and system interfaces, and all UWSS external interfaces; and	Mandatory	A			
SRD-1309	(k) UWSS HM monitored element information in accordance with the table of UWSS Health Management Monitored Elements in Section 3.1.1.7.	Mandatory	A			
SRD-136	3.9.7.1.3 The hardware and software interface to the CMS 330 must pass the following information from CMS 330 to the UDMS:	Mandatory	D			
SRD-137	(a) contacts of interest including, as a minimum, radar and Electronic Warfare (EW) information related to submarine and other emitters, such as radar and communications equipment;	Mandatory	A			
SRD-138	(b) areas of probability (AOPs) for all such contacts (i.e. square, circular, and ellipse as applicable to the originating sensor);	Mandatory	A			
SRD-298	(c) all UWW related alert messages;	Mandatory	A			
SRD-299	(d) all UWW related overlays, including weapons firing exclusion zones;	Mandatory	A			
SRD-300	(e) UWW related LINK 11, 16 and 22 (MultiLINK) information;	Mandatory	A			
SRD-301	(f) track management control messages;	Mandatory	A			
SRD-	(g) system control and system status information,	Mandatory	A			

ID		Requirement Type	Compliance Demonstration Method	Bidder's Response	Evaluation of Bidder's Response	Compliant (Y/N)
302	including clock synchronization;					
SRD-303	(h) launch time and location of all Lightweight Torpedoes launched by ownship, task group ship, helicopter, and aircraft;	Mandatory	A			
SRD-304	(i) deployment location, RF channel, sensor depth, and lifetime of all task group sonobuoys, both passive and active;	Mandatory	A			
SRD-305	(j) ping schedules for task group active sonars;	Mandatory	A			
SRD-306	(k) deployment time, type and operating lifetime of every expendable acoustic countermeasure;	Mandatory	A			
SRD-1310	(l) interface status and control information;	Mandatory	A			
SRD-1493	(m) Other UWW related information including UWW sensor contact information from non-UWSS sensors and sources such as from other ship sensors, task group units, helicopters, fixed-wing aircraft, and global sources; and	Mandatory	A			
SRD-1498	(n) doctrine information related to UWW including system, subsystem and sensor configuration and settings, system management, health management, and system operating parameters, in order to facilitate execution of the CMS 330 doctrine propagated into the UWSS.	Mandatory	A			
SRD-968	3.9.7.1.4 The hardware and software interface to the CMS 330 should pass the following information from CMS 330 to the UDMS:	Desirable	D			
SRD-307	(a) Integrated Platform Management System (IPMS) data, including propeller RPM, propeller pitch, engine	Desirable	D			

ID		Requirement Type	Compliance Demonstration Method	Bidder's Response	Evaluation of Bidder's Response	Compliant (Y/N)
	and gearbox configuration, and rudder angle; and					
SRD-309	(b) the operational modes of the Towed Torpedo Countermeasure (TTCM).	Desirable	D			
SRD-1114	3.9.7.2 Navigation Data Distribution System (NavDDS)	Heading	N/A			
SRD-1061	3.9.7.2.1 The UDMS must include a hardware and software interface to the NavDDS, as necessary in order to meet the requirements of this SRD.	Mandatory	D			
SRD-1072	3.9.7.2.2 The hardware and software interface to the NavDDS must pass the following information from NavDDS to the UDMS to the extent permitted by the “Interface Design Document between the Halifax Class Navigation Data Distribution System and the Underwater Warfare Sensor System”:	Mandatory	D			
SRD-1075	(a) ownship navigation data;	Mandatory	A			
SRD-1115	(b) environmental data;	Mandatory	A			
SRD-397	(c) meteorological data;	Mandatory	A			
SRD-1117	(d) Automatic Identification System (AIS) information;	Mandatory	A			
SRD-1118	(e) Automatic Radar Plotting Aid information;	Mandatory	A			
SRD-1119	(f) Precise Time of Day;	Mandatory	A			
SRD-1081	(g) clock synchronization messages; and	Mandatory	A			
SRD-	(h) data from the Echo Sounder System;	Mandatory	A			

ID		Requirement Type	Compliance Demonstration Method	Bidder's Response	Evaluation of Bidder's Response	Compliant (Y/N)
1116						
SRD-1120	3.9.7.2.3 The UDMS must manage data from zero (0) to greater than 200 AIS contacts.	Mandatory	A			
SRD-1121	3.9.7.2.4 The UDMS must exchange data with the NavDDS utilizing the messages specified in "National Marine Electronics Association (NMEA) 0183 Standard for Interfacing Marine Electronic Devices Version 3.01 dated 30 January 2002".	Mandatory	A			
SRD-1122	3.9.7.2.5 The UDMS must calculate position based on the geospatial model approximation of the World Geodetic System 1984.	Mandatory	A			
SRD-1123	3.9.7.2.6 The UDMS must acquire the precise time of day reference from the NavDDS in the IRIG B123 format.	Mandatory	A			
SRD-1124	3.9.7.2.7 The UDMS must use the precise time of day acquired from the NavDDS unless otherwise specified in this SRD.	Mandatory	A			
SRD-1125	3.9.7.2.8 The UDMS must use the precise time of day acquired from the stand alone precise time of day source in the event that the NavDDS precise time of day becomes unavailable.	Mandatory	D			
SRD-1126	3.9.7.2.9 The UDMS must synchronize to a common Coordinated Universal Time system time as provided by the NavDDS.	Mandatory	D			
SRD-1127	3.9.7.3 Echo Sounder System	Heading	N/A			
SRD-1302	3.9.7.3.1 The UDMS may include a direct hardware and software interface to the Echo Sounder, as necessary in order to meet the requirements of this SRD.	Optional	D			
SRD-1128	3.9.7.3.2 The UDMS may implement the passing of information from the echo sounder using direct interfaces.	Optional	D			
SRD-1129	3.9.7.3.3 The UDMS should pass the following information from the Echo Sounder System to the UDMS:	Desirable	A			
SRD-	(a) notification of operation of the ship's Echo	Desirable	A			

ID		Requirement Type	Compliance Demonstration Method	Bidder's Response	Evaluation of Bidder's Response	Compliant (Y/N)
1086	Sounder System.					
SRD-1090	3.9.7.4 For redundancy, the passing of navigational information and clock synchronization information may also be implemented with an interface to the CMS 330.	Optional	D			
SRD-379	3.9.7.5 The UDMS must manually enter IPMS data that includes propeller RPM, propeller pitch, engine and gearbox configuration, and rudder angle, under operator control.	Mandatory	D			
SRD-893	3.9.7.6 The UDMS may implement the passing of information from IPMS and TTCM using direct interfaces to those systems.	Optional	D			
SRD-381	3.9.7.7 The UDMS must manually enter operational modes of the Towed Torpedo Countermeasure, under operator control.	Mandatory	D			
SRD-166	3.9.8 Human Machine Interface	Heading	N/A			
SRD-886	3.9.8.1 General	Heading	N/A			
SRD-499	3.9.8.1.1 The UDMS must provide the Human Machine Interface (HMI) for the operators to utilize the UWSS in order to meet the requirements of this SRD.	Mandatory	D			
SRD-966	3.9.8.1.2 The HMI must be designed and implemented in a manner consistent with the requirements of MIL-STD-1472F.	Mandatory	D			
SRD-911	3.9.8.1.3 The HMI must interact with all functions of the UWSS USCs and all functions of the UDMS, under operator control.	Mandatory	D			
SRD-920	3.9.8.1.4 All UWSS operator displays and controls must be displayed at each of the four (4) operator consoles in the Operations Room, under operator control.	Mandatory	D			
SRD-1189	3.9.8.1.5 All UWSS operator displays and controls must allow operator interaction at each of the four (4) operator consoles in the Operations Room.	Mandatory	D			

ID		Requirement Type	Compliance Demonstration Method	Bidder's Response	Evaluation of Bidder's Response	Compliant (Y/N)
SRD-500	3.9.8.1.6 The HMI must display and provide operator control interfaces on Operations Room workstations.	Mandatory	D			
SRD-207	3.9.8.1.7 Each operator workstation must include a keyboard and trackball, or equivalent means, for system manipulation.	Mandatory	D			
SRD-524	3.9.8.1.8 The UDMS must provide the capabilities for operators to:	Mandatory	A			
SRD-525	(a) configure displays, including the selection, size and location of windows;	Mandatory	A			
SRD-526	(b) save display configurations in nonvolatile memory and be able to manage and recall those configurations; and	Mandatory	A			
SRD-527	(c) create and save combinations of windows associated with every combination of active and passive displays of USCs, and every other display created for the UWSS.	Mandatory	A			
SRD-1037	3.9.8.1.9 Each operator workstation must include a default configuration that is used upon initial power-up.	Mandatory	D			
SRD-1038	3.9.8.1.10 Upon warm-boot each operator workstation must restart in its display configuration last in effect.	Mandatory	D			
SRD-206	3.9.8.1.11 On each operator display surface making up the UWSS, the system status consisting of system date and time, ship's position, speed and heading must be displayed.	Mandatory	A			
SRD-171	3.9.8.1.12 System status must be updated at a rate of no less than once per second.	Mandatory	A			
SRD-474	3.9.8.1.13 The UDMS must provide text displays of bearing, range, frequency and time in accordance with the position of operator controlled cursors.	Mandatory	A			
SRD-	3.9.8.1.14 The UDMS must provide graphical displays of target	Mandatory	A			

ID		Requirement Type	Compliance Demonstration Method	Bidder's Response	Evaluation of Bidder's Response	Compliant (Y/N)
1034	bearing and range automatically on tactical plots.					
SRD-1035	3.9.8.1.15 Target bearings must be recorded and reported relative to the ownship's master datum.	Mandatory	A			
SRD-475	3.9.8.1.16 The UDMS must provide operator controlled time and frequency harmonic cursors.	Mandatory	A			
SRD-479	3.9.8.1.17 The UDMS must control the display time history for applicable plots, under operator control.	Mandatory	A			
SRD-411	3.9.8.1.18 The UDMS must enter annotations on all sonar displays, under operator control.	Mandatory	A			
SRD-412	3.9.8.1.19 Operator annotations must be automatically timestamped.	Mandatory	A			
SRD-413	3.9.8.1.20 Operator annotations must automatically include context sensitive data, such as bearing and frequency, corresponding to the location of the display where the annotation was entered.	Mandatory	A			
SRD-414	3.9.8.1.21 Operator annotations must be recorded by the Data Recording, Replay and Management System (DRRMS).	Mandatory	A			
SRD-459	3.9.8.1.22 The UDMS must include colour palettes for operators to choose colour coding for representing directional information.	Mandatory	A			
SRD-897	3.9.8.1.23 The UDMS must define and select no less than ten (10) multiple simultaneous passive sonar processing settings for bandwidth, frequency resolution, and update rate, under operator control.	Mandatory	D			
SRD-530	3.9.8.1.24 Each operator workstation must include an audio replay capability with the following:	Mandatory	A			
SRD-531	(a) an operator accessible standard audio jack;	Mandatory	A			
SRD-532	(b) headphones of sufficient audio quality, including active noise cancellation, for listening to raw and	Mandatory	A			

ID		Requirement Type	Compliance Demonstration Method	Bidder's Response	Evaluation of Bidder's Response	Compliant (Y/N)
	beam formed audio from every active and passive sensor;					
SRD-533	(c) select and listen to audio from every channel of every USC, under operator control;	Mandatory	A			
SRD-535	(d) select and listen to live and recorded audio, under operator control;	Mandatory	A			
SRD-534	(e) select and listen to raw and processed audio, under operator control; and	Mandatory	A			
SRD-807	(f) select and mix down high frequency audio in human audible frequency ranges, under operator control.	Mandatory	A			
SRD-912	3.9.8.2 Passive Sonar Displays and Operator Controls	Heading	N/A			
SRD-913	3.9.8.2.1 The UDMS must provide the following passive sonar displays for all passive sonar USCs:	Mandatory	A			
SRD-914	(a) normalized broadband Bearing Time Intensity (BTI);	Mandatory	A			
SRD-915	(b) normalized narrowband Bearing Time Intensity (NBTI);	Mandatory	A			
SRD-916	(c) normalized narrowband versus frequency (LOFAR); and	Mandatory	A			
SRD-917	(d) DEMON.	Mandatory	A			
SRD-924	3.9.8.2.2 BTI Displays must include time-history of ship's heading.	Mandatory	A			
SRD-1098	3.9.8.2.3 BTI Displays must include time-history of the TAPS USC heading for TAPS Passive displays.	Mandatory	A			
SRD-	3.9.8.2.4 All time scales must display a minimum of 30 minutes of	Mandatory	A			

ID		Requirement Type	Compliance Demonstration Method	Bidder's Response	Evaluation of Bidder's Response	Compliant (Y/N)
969	data history.					
SRD-922	3.9.8.2.5 The UDMS must select multiple simultaneous passive processing and display settings for bandwidth, frequency resolution, and update rate, under operator control.	Mandatory	A			
SRD-923	3.9.8.2.6 The UDMS must select passive processing and display modes independently for all passive USCs, under operator control.	Mandatory	A			
SRD-488	3.9.8.3 Active Sonar Displays and Operator Controls	Heading	N/A			
SRD-222	3.9.8.3.1 The UDMS must provide operator control interfaces for all active sonar USCs, implementing the following control functions:	Mandatory	D			
SRD-223	(a) enable and disable active transmissions;	Mandatory	A			
SRD-224	(b) modify transmission pulse frequency, waveform type, length and power level;	Mandatory	A			
SRD-225	(c) modify inter-pulse period in terms of either time and range;	Mandatory	A			
SRD-226	(d) modify directional transmission characteristics;	Mandatory	A			
SRD-227	(e) generate single pings; and	Mandatory	A			
SRD-228	(f) define and initiate automated transmitter control to follow marine mammal mitigation procedures.	Mandatory	A			
SRD-261	3.9.8.3.2 The UDMS must provide the following operator display functions for all active sonar USCs:	Mandatory	D			
SRD-268	(a) system status, whether operational or non-operational;	Mandatory	A			
SRD-263	(b) transmission pulse frequency, waveform type, length and power level settings;	Mandatory	A			

ID		Requirement Type	Compliance Demonstration Method	Bidder's Response	Evaluation of Bidder's Response	Compliant (Y/N)
SRD-264	(c) inter-pulse period in terms of either time and range;	Mandatory	A			
SRD-265	(d) directional transmission characteristics;	Mandatory	A			
SRD-491	(e) active Plan-Position-Indicator (PPI), showing ping history and colour coding for target Doppler;	Mandatory	A			
SRD-492	(f) active ping feature versus range (A-scan), divided up into multiple bearing sectors and one overall all-azimuth (360^{o}) view, showing ping history and colour coding for target Doppler;	Mandatory	A			
SRD-493	(g) active ping feature versus range and bearing (B-scan), showing ping history and colour coding for target Doppler;	Mandatory	A			
SRD-1100	(h) directional displays must be absolute and ship's head relative, as selected by the operator;	Mandatory	A			
SRD-494	(i) instantaneous display of transmit pulse range from source; and	Mandatory	A			
SRD-1099	(j) ownship heading and TAPS heading.	Mandatory	A			
SRD-489	3.9.8.3.3 The Active Sonar displays must filter displayed results based on Doppler that includes filtering on speed and whether closing or opening, under operator control.	Mandatory	D			
SRD-497	3.9.8.3.4 The PPI displays must zoom the display in and out, under operator control.	Mandatory	D			
SRD-468	3.9.8.4 TAPS Displays and Operator Controls	Heading	N/A			
SRD-469	3.9.8.4.1 The UDMS must include all of the passive and active sonar displays and controls for the TAPS USC, as defined in paragraphs	Mandatory	A			

ID		Requirement Type	Compliance Demonstration Method	Bidder's Response	Evaluation of Bidder's Response	Compliant (Y/N)
	3.9.8.2 and 3.9.8.3.					
SRD-244	3.9.8.4.2 The TAPS operator interface must display the towed system depth in meters, deployed scope in meters, heading in degrees True (converted automatically from magnetic heading by the UWSS, if required), and water temperature in degrees Celsius with an update rate of no less than once per second.	Mandatory	A			
SRD-285	3.9.8.5 SPS Displays and Operator Controls	Heading	N/A			
SRD-921	3.9.8.5.1 The UDMS must include all of the passive and active sonar displays and controls for the SPS USC, as defined in paragraphs 3.9.8.2 and 3.9.8.3.	Mandatory	A			
SRD-501	3.9.8.5.2 The UDMS must include the following displays for the SPS USC:	Mandatory	A			
SRD-502	(a) all Passive Sonar Displays as defined under Passive Sonar General Requirements; and	Mandatory	A			
SRD-503	(b) all Active Sonar Displays as defined under Active Sonar General Requirements;	Mandatory	A			
SRD-284	3.9.8.5.3 The SPS operator display must include a status display containing the following information for all sonobuoys for which telemetry is being received:	Mandatory	D or S			
SRD-286	(a) sonobuoy type;	Mandatory	A			
SRD-287	(b) RF channel allocations;	Mandatory	A			
SRD-288	(c) location in latitude and longitude;	Mandatory	A			
SRD-888	(d) sensor depth;	Mandatory	A			

ID		Requirement Type	Compliance Demonstration Method	Bidder's Response	Evaluation of Bidder's Response	Compliant (Y/N)
SRD-889	(e) operational mode;	Mandatory	A			
SRD-890	(f) predicted remaining lifetime; and	Mandatory	A			
SRD-289	(g) DIFAR lock status.	Mandatory	A			
SRD-282	3.9.8.5.4 The SPS status display must be updated with a rate of no less than once per second.	Mandatory	D or S			
SRD-283	3.9.8.5.5 The SPS must manually input and manually modify sonobuoy locations, in latitude and longitude, under operator control.	Mandatory	D or S			
SRD-290	3.9.8.5.6 The SPS must control active sonobuoys using both older UHF format for DICASS sonobuoys and new CFS protocols, including selection of pulse types, pulse lengths, and pulse intervals, under operator control.	Mandatory	D or S			
SRD-291	3.9.8.5.7 The SPS must parse and incorporate ping schedules received from external sources.	Mandatory	D or S			
SRD-522	3.9.8.6 TORSIC Displays and Operator Controls	Heading	N/A			
SRD-609	3.9.8.6.1 The Hull Mounted TORSIC USC and the TORSIC included as part of the TAPS USC must share a common operator interface.	Mandatory	A			
SRD-611	3.9.8.6.2 The TORSIC operator interface must be displayed at each of the four (4) operator consoles in the Operations Room, under operator control.	Mandatory	A			
SRD-1190	3.9.8.6.3 The TORSIC operator interface must allow operator interaction at each of the four (4) operator consoles in the Operations Room.	Mandatory	A			
SRD-	3.9.8.6.4 The UDMS must provide operator control interfaces for all	Mandatory	D			

ID		Requirement Type	Compliance Demonstration Method	Bidder's Response	Evaluation of Bidder's Response	Compliant (Y/N)
252	TORSIC sensors, implementing the following control functions:					
SRD-253	(a) enable and disable operation;	Mandatory	A			
SRD-254	(b) adjust automated detection and classification parameters;	Mandatory	A			
SRD-255	(c) modify alert parameters; and	Mandatory	A			
SRD-256	(d) replay processing and audio output of recordings.	Mandatory	A			
SRD-269	3.9.8.6.5 The UDMS must provide the following operator display functions for all TORSIC sensors:	Mandatory	D			
SRD-270	(a) system status, whether operational or non-operational;	Mandatory	A			
SRD-271	(b) automated detection and classification parameters;	Mandatory	A			
SRD-272	(c) alert parameters, including sonar frequency, ping duration, ping interval, and classification score;	Mandatory	A			
SRD-274	(d) status of all UWSS active sonar USCs and of the AN/SLQ-25A TTCM;	Mandatory	A			
SRD-799	(e) status of all expendable acoustic countermeasures;	Mandatory	A			
SRD-275	(f) status of all known weapons, i.e. ownship and task group launched torpedoes; and	Mandatory	A			
SRD-802	(g) estimated bearing to all detections meeting alert criteria.	Mandatory	A			
SRD-797	3.9.8.6.6 The UDMS must provide a display of TORSIC data as time-scrolling narrowband frequency spectrograms.	Mandatory	D			
SRD-	3.9.8.6.7 The TORSIC spectrograms must provide operator control of	Mandatory	D			

ID		Requirement Type	Compliance Demonstration Method	Bidder's Response	Evaluation of Bidder's Response	Compliant (Y/N)
804	frequency zoom, time averaging and background averaging.					
SRD-805	3.9.8.6.8 The TORSIC spectrograms must provide operator cursor controlled display of time and frequency.	Mandatory	D			
SRD-806	3.9.8.6.9 The TORSIC spectrograms must provide overlays that are indicators of currently set alert parameters.	Mandatory	D			
SRD-803	3.9.8.6.10 The UDMS must provide a processing and audio replay function for TORSIC alerts, as selected and controlled by the operator.	Mandatory	D			
SRD-187	3.9.9 Data Collection	Heading	N/A			
SRD-143	3.9.9.1 The UDMS must include a Data Recording, Replay and Management System (DRRMS) in accordance with the Data Collection Requirements, Appendix 1 of this SRD.	Mandatory	D			
SRD-157	3.9.10 Tactical Decision Aids	Heading	N/A			
SRD-343	3.9.10.1 The UDMS must include Tactical Decision Aids tools for tactical planning, including multistatic sensor coordination.	Mandatory	D			
SRD-192	3.9.10.2 The Tactical Decision Aids must be functionally interfaced with the overall UWSS and automatically use data from sensors and other external sources as required.	Mandatory	D			
SRD-344	3.9.10.3 Database systems must manage data needed for the operation of the Tactical Decision Aids, including:	Mandatory	D			
SRD-345	(a) ship signatures (including predicted ownship signature as a function of speed, manoeuvring and machinery state);	Mandatory	A			
SRD-346	(b) threat target echo strengths; and	Mandatory	A			
SRD-	(c) hydrographic and bathymetric data.	Mandatory	A			

ID		Requirement Type	Compliance Demonstration Method	Bidder's Response	Evaluation of Bidder's Response	Compliant (Y/N)
348						
SRD-349	3.9.10.4 The UDMS Tactical Decision Aids must calculate, accept operator input for, and display the following:	Mandatory	A			
SRD-350	(a) AOPs;	Mandatory	A			
SRD-351	(b) digital tactical charts;	Mandatory	A			
SRD-352	(c) water space management tools;	Mandatory	A			
SRD-353	(d) free form lines, circles and arcs on top of Tactical Plots;	Mandatory	A			
SRD-354	(e) marine mammal mitigation zones of influence; and	Mandatory	A			
SRD-355	(f) predicted physical behaviour of the TAPS, including position relative to the ship and curvature of the array, as a function of cable scope, ship’s speed, and manoeuvres.	Mandatory	A			
SRD-970	3.9.10.5 The UDMS Tactical Decision Aids should calculate, accept operator input for, and display the following:	Desirable	A			
SRD-356	(a) digital navigation charts (desirable); and	Desirable	A			
SRD-357	(b) Ocean Features Analysis (desirable).	Desirable	A			
SRD-742	3.9.10.6 The predicted physical behaviour of the TAPS must be overlayed with the actual behaviour of the TAPS while deployed, as reported in real-time by the TAPS NAD modules.	Mandatory	A			
SRD-197	3.9.10.7 For sonobuoys, the UDMS must provide tools for operators to draw equivalent bearing lines from sensor locations on digital	Mandatory	A			

ID		Requirement Type	Compliance Demonstration Method	Bidder's Response	Evaluation of Bidder's Response	Compliant (Y/N)
	tactical charts.					
SRD-1033	3.9.10.8 For all organic USCs, the UDMS must provide tools for operators to draw equivalent bearing lines relative to ownship on digital tactical charts.	Mandatory	A			
SRD-478	3.9.10.9 The UDMS must provide tools for operators to draw equivalent bearing lines from sensor locations on active sonar displays.	Mandatory	A			
SRD-477	3.9.10.10 The UDMS must perform estimates of marine mammal zones of influence.	Mandatory	A			
SRD-476	3.9.10.11 Marine mammal zones of influence must be displayed on digital tactical charts.	Mandatory	A			
SRD-1036	3.9.11 Target Motion Analysis	Heading	N/A			
SRD-1040	3.9.11.1 The UDMS must perform Target Motion Analysis (TMA).	Mandatory	D			
SRD-1048	3.9.11.2 The UDMS TMA derived contacts must form part of the RSSP.	Mandatory	D			
SRD-1042	3.9.11.3 The UDMS TMA algorithms must automatically produce estimates of position, speed, and heading, with associated uncertainty estimates, bearings-only passive acoustic data.	Mandatory	D			
SRD-1041	3.9.11.4 The UDMS must automatically initiate TMA on every bearings-only passive acoustic contact data with sufficiently high classification of submarine and torpedo, including TORSIC bearings.	Mandatory	D			
SRD-1043	3.9.11.5 The UDMS must provide facility for operator initiation of TMA on other contacts of interest from non-acoustic sources.	Mandatory	D			
SRD-1046	3.9.11.6 The automated TMA algorithm must include a facility that enters target velocity under operator control, and must constrain the TMA solution according to that velocity.	Mandatory	D			

ID		Requirement Type	Compliance Demonstration Method	Bidder's Response	Evaluation of Bidder's Response	Compliant (Y/N)
SRD-1049	3.9.11.7 The TMA tool must enable and disable the constraint, under operator control.	Mandatory	D			
SRD-165	3.9.12 Acoustic Range Prediction	Heading	N/A			
SRD-191	3.9.12.1 The UDMS must perform underwater Acoustic Range Prediction (ARP).	Mandatory	D			
SRD-358	3.9.12.2 The UDMS ARP function must:	Mandatory	D			
SRD-359	(a) utilize environmental data, including Ocean Features Analysis, threat, and own force data;	Mandatory	A			
SRD-360	(b) convert the data through the use of various acoustic models into range predictions;	Mandatory	A			
SRD-361	(c) display the results through meaningful visual graphics and tables for operators;	Mandatory	A			
SRD-362	(d) utilize oceanographic and meteorological information in both its predictive form (model data), historical libraries, and observations (bathymetric probes);	Mandatory	A			
SRD-363	(e) utilize model data as a full 4D representation (x-y-z over time) of the ocean and the atmosphere to account for boundaries in the water mass;	Mandatory	A			
SRD-364	(f) include bathymetric data to represent the ocean bottom both in depth and type to include their impacts on acoustic propagation calculations;	Mandatory	A			
SRD-365	(g) utilize threat and own force database information to calculate effective ranges;	Mandatory	A			
SRD-838	(h) utilize estimated ownship radiated noise signature to calculate counter-detection ranges;	Mandatory	A			

ID		Requirement Type	Compliance Demonstration Method	Bidder's Response	Evaluation of Bidder's Response	Compliant (Y/N)
SRD-366	(i) directly modify elements of the Figure of Merit (FOM) equation, under operator control; and	Mandatory	A			
SRD-367	(j) conduct bistatic range predictions for active sonobuoys.	Mandatory	A			
SRD-144	3.9.12.3 The UDMS must implement a user interface that encompasses all user interface functions of the Mk8-F Bathythermograph Recording System as a local function on the UWSS workstations, eliminating the legacy Mk8-F legacy installation in the Ops Room.	Mandatory	D			
SRD-142	3.9.12.4 The UDMS must incorporate the functions of the Mk8-F Bathythermograph Recording System, that supports the following probe types: 6655-00-162-2479, PROBE, BATHYTHERMOGRAPH (400M depth) 6655-00-932-1353, PROBE, BATHYTHERMOGRAPH (2000M depth) 6680-01-187-0817, PROBE, VELOCIMETER (2000M depth)	Mandatory	A			
SRD-1136	3.9.12.5 The UDMS must implement a database to manage information for the operation of the Acoustic Range Prediction, including:	Mandatory	A			
SRD-1137	(a) bathymetric data;	Mandatory	A			
SRD-1138	(b) bottom type;	Mandatory	A			
SRD-1139	(c) ambient noise levels;	Mandatory	A			
SRD-1140	(d) oceanographic data;	Mandatory	A			

ID		Requirement Type	Compliance Demonstration Method	Bidder's Response	Evaluation of Bidder's Response	Compliant (Y/N)
SRD-1143	(e) environmental data;	Mandatory	A			
SRD-1141	(f) meteorological forecast data; and	Mandatory	A			
SRD-1142	(g) meteorological observational data.	Mandatory	A			
SRD-1147	3.9.12.6 The UDMS must import, under operator control, all of the different types of data specified in Section 3.9.12.5 into the database, from files on digital media that are specified in Comma-Separated Values format.	Mandatory	A			
SRD-1413	3.9.12.7 The UDMS must import and store no less than twenty (20) files from digital media into the database, under operator control.	Mandatory	A			
SRD-1149	3.9.12.8 The UDMS must remove an imported file, under operator control.	Mandatory	A			
SRD-1414	3.9.12.9 For each imported file, the UDMS must incorporate user file metadata including source, version, and description information in operator modifiable fields, under operator control.	Mandatory	A			
SRD-1415	3.9.12.10 For each imported file, the UDMS must modify the source, version, and description information in operator modifiable fields, under operator control.	Mandatory	A			
SRD-1416	3.9.12.11 The UDMS must store the source, version, and description information of all imported files.	Mandatory	A			
SRD-1152	3.9.12.12 The UDMS must display the source, version, and description information of all imported files, under operator control.	Mandatory	A			
SRD-1417	3.9.12.13 For each imported file, the UDMS must store the user file metadata and timestamp of import information.	Mandatory	A			
SRD-1418	3.9.12.14 The UDMS must display the user file metadata and timestamp of import information of all imported files, under	Mandatory	A			

ID		Requirement Type	Compliance Demonstration Method	Bidder's Response	Evaluation of Bidder's Response	Compliant (Y/N)
	operator control.					
SRD-1419	3.9.12.15 The UDMS must delete each of the different of the types of data specified in Section 3.9.12.5 from the database, under operator control.	Mandatory	A			
SRD-1148	3.9.12.16 The UDMS must display all or subset of the database contents, under operator control.	Mandatory	A			
SRD-1150	3.9.12.17 The UDMS must manually modify all and subsets of the types of data specified in Section 3.9.12.5 in the database, under operator control.	Mandatory	A			
SRD-1153	3.9.12.18 The UDMS must utilize all and subsets of the types of data specified in Section 3.9.12.5 in the database to perform underwater Acoustic Range Prediction, under operator control.	Mandatory	A			
SRD-1499	3.9.12.19 The UDMS must allow the operators to capture screen images of Acoustic Range Prediction results in jpeg format from all UWSS Operator consoles.	Mandatory	A			
SRD-1500	3.9.12.20 The UDMS must annotate the captured screen images of Acoustic Range Prediction results with originating source (UWSS Operator console), the time and date and ship's location.	Mandatory	A			
SRD-1501	3.9.12.21 The UDMS must export captured screen images of Acoustic Range Prediction results, under operator control.	Mandatory	A			
SRD-1502	3.9.12.22 The UDMS must have an interface to provide personnel access to the exported captured screen images of Acoustic Range Prediction results using a means compliant with the derived security requirements for the UWSS.	Mandatory	A			
SRD-189	3.9.13 Ownship Noise Monitoring	Heading	N/A			
SRD-190	3.9.13.1 The UDMS must perform Ownship Noise Monitoring (ONM).	Mandatory	D			

ID		Requirement Type	Compliance Demonstration Method	Bidder's Response	Evaluation of Bidder's Response	Compliant (Y/N)
SRD-812	3.9.13.2 The ONM system must monitor all frequencies between ONM_FMIN Hz and ONM_FMAX Hz using the TAPS, HMS and hull-mounted TORSIC USCs when these USCs are deployed and operational.	Mandatory	D			
SRD-1182	3.9.13.3 The ONM system must monitor all available subsets of frequencies between ONM_FMIN Hz and ONM_FMAX Hz in cases where not all USCs are deployed or operational.	Mandatory	A			
SRD-813	3.9.13.4 The ONM system must calculate and display estimates of the actual real-time ownship narrowband and broadband acoustic signatures in dB re 1 µPa at 1 meter using sensor calibration data and transfer functions.	Mandatory	D			
SRD-835	3.9.13.5 The ONM system must calculate estimates of ownship acoustic signatures based on a single USC and on combinations of USCs, as selected by the operator.	Mandatory	D			
SRD-814	3.9.13.6 The ONM system must calculate and display estimated ownship acoustic signatures at a rate of no less than once every ten (10) seconds.	Mandatory	A			
SRD-827	3.9.13.7 The ONM system should calculate and display estimated ownship acoustic signatures at a rate of no less than once every one (1) seconds.	Desirable	A			
SRD-881	3.9.13.8 The ONM system should estimate and display of ambient noise levels in dB re 1 $\mu Pa^2/Hz$.	Desirable	A			
SRD-823	3.9.13.9 The ONM system must enter the following ship propulsion and machinery state information manually, and update the information as necessary, under operator control:	Mandatory	A			
SRD-816	(a) port and starboard shaft rate;	Mandatory	A			
SRD-	(b) port and starboard propeller pitch;	Mandatory	A			

ID		Requirement Type	Compliance Demonstration Method	Bidder's Response	Evaluation of Bidder's Response	Compliant (Y/N)
817						
SRD-818	(c) rudder angle; and	Mandatory	A			
SRD-819	(d) ship's tactical stance (i.e., quiet states associated with machinery running bills).	Mandatory	A			
SRD-815	3.9.13.10 The ONM system should acquire and record the ship's propulsion and machinery state directly from the Integrated Platform Management System (IPMS) or indirectly from the CMS 330.	Desirable	D			
SRD-820	3.9.13.11 Updates of the ship propulsion and machinery state information should be no less than once per second.	Desirable	A			
SRD-811	3.9.13.12 The design of ONM must allow input from additional sensors, including inboard fitted accelerometers.	Mandatory	D			
SRD-821	3.9.13.13 The ONM operator control and display must be available and selectable by operators at every UWSS workstation.	Mandatory	A			
SRD-842	3.9.13.14 The ONM system must implement a signature database consisting of narrowband and broadband historical and class average signatures versus frequency.	Mandatory	A			
SRD-843	3.9.13.15 The ONM signature database must enter and manage the data contained in the database, under operator control.	Mandatory	A			
SRD-840	3.9.13.16 The ONM system must provide a feature of the signature database that enters machinery tonal information that includes specifically machinery identifier, compartment, and, all known tonal frequencies, under operator control.	Mandatory	A			
SRD-831	3.9.13.17 The ONM system must provide operator selection of historical and class average radiated noise signatures to form a baseline for comparison against the ONM calculated estimates.	Mandatory	A			
SRD-	3.9.13.18 The ONM system must define alert thresholds versus	Mandatory	A			

ID		Requirement Type	Compliance Demonstration Method	Bidder's Response	Evaluation of Bidder's Response	Compliant (Y/N)
832	frequency against the baseline, under operator control.					
SRD-836	3.9.13.19 The ONM system must define alert thresholds individually for specific USCs and in combination, under operator control.	Mandatory	A			
SRD-833	3.9.13.20 The ONM baseline for the expected ownship noise level must be defined on a per sensor basis.	Mandatory	A			
SRD-822	3.9.13.21 The ONM operator display must include:	Mandatory	A			
SRD-824	(a) ship's propulsion and machinery state;	Mandatory	A			
SRD-825	(b) ship's speed, heading, pitch and roll;	Mandatory	A			
SRD-826	(c) environmental information, including wind speed and wave height;	Mandatory	A			
SRD-828	(d) estimated ship's radiated noise signature;	Mandatory	A			
SRD-829	(e) overlays of historical and class average radiated noise signatures; and	Mandatory	A			
SRD-830	(f) overlays of operator defined alert thresholds.	Mandatory	A			
SRD-837	3.9.13.22 The ONM system must compare the estimated ownship radiated noise signature against the defined thresholds, and raise an alert when those thresholds are exceeded.	Mandatory	A			
SRD-841	3.9.13.23 When alerts occur, the ONM system must automatically attempt to associate known machinery tonals with the event and display the results on the ONM display.	Mandatory	A			
SRD-1480	3.9.14 Transient Detection and Processing Requirements	Heading	N/A			
SRD-	3.9.14.1 The UDMS must define alert thresholds for acoustic	Mandatory	D			

ID		Requirement Type	Compliance Demonstration Method	Bidder's Response	Evaluation of Bidder's Response	Compliant (Y/N)
1486	transients versus frequency and amplitude, under operator control.					
SRD-1487	3.9.14.2 The UDMS must reprocess and aurally replay detected acoustic transients under operator control in order to aid in classification of the source.	Mandatory	D			
SRD-156	3.9.15 Marine Mammal Mitigation Requirements	Heading	N/A			
SRD-801	3.9.15.1 The UDMS must implement capabilities, tools and databases that will allow the ship's operators to implement Marine Mammal Mitigation Procedures as required by operational authorities, including:	Mandatory	D			
SRD-1474	(a) active sonar control;	Mandatory	D			
SRD-1475	(b) tactical decision aids;	Mandatory	D			
SRD-1476	(c) operator aids for Marine Mammal classification; and	Mandatory	D			
SRD-1477	(d) automated alerts.	Mandatory	D			
SRD-1473	3.9.15.2 The UDMS must define alert thresholds for Marine Mammal vocalizations versus frequency and amplitude, under operator control.	Mandatory	D			
SRD-1470	3.9.15.3 The UDMS must reprocess and aurally replay detected Marine Mammal vocalizations under operator control in order to aid in classification of the source.	Mandatory	D			
SRD-246	3.9.16 Alerts	Heading	N/A			
SRD-967	3.9.16.1 Alerts must be implemented in a manner consistent with the requirements as stated in MIL-STD-1472F.	Mandatory	A			

ID		Requirement Type	Compliance Demonstration Method	Bidder's Response	Evaluation of Bidder's Response	Compliant (Y/N)
SRD-795	3.9.16.2 The UDMS must implement the following automated alerts, and display these alerts at each operator workstation immediately when they occur:	Mandatory	A			
SRD-248	(a) when the TAPS towed system is within 50 meters of the seabed;	Mandatory	A			
SRD-895	(b) when torpedo automatic detection occurs;	Mandatory	A			
SRD-249	(c) when TORSIC active sonar detection criteria are met;	Mandatory	A			
SRD-839	(d) when ONM radiated noise thresholds are exceeded;	Mandatory	A			
SRD-906	(e) when automatic detection of the operation of Underwater Telephones and Emergency Locator signals occur;	Mandatory	A			
SRD-1471	(f) when automatic detection of acoustic transients occur; and	Mandatory	A			
SRD-1472	(g) when automatic detection of Marine Mammal vocalizations occur.	Mandatory	A			
SRD-247	3.9.16.3 All alerts must be accompanied by an audible warning.	Mandatory	A			
SRD-158	3.10 Training System Requirements	Heading	N/A			
SRD-932	3.10.1 General	Heading	N/A			
SRD-933	3.10.1.1 The Training Systems delivered with the UWSS must include all hardware, software and training materials for training Sonar Operators, Weapons Engineering Technicians, Combat Systems Engineering Officers and Underwater Warfare Directors as necessary	Mandatory	A			

ID		Requirement Type	Compliance Demonstration Method	Bidder's Response	Evaluation of Bidder's Response	Compliant (Y/N)
	to permit operation and maintenance of the UWSS in order to meet the requirements of this SRD.					
SRD-941	3.10.1.2 Training systems and materials must be developed using an approach that is consistent with DAOD 5031-2 and NAVORD 4500-0, and that meets the intent of the Future Naval Training System Strategy (FNTSS) to the greatest extent possible.	Mandatory	A			
SRD-942	3.10.1.3 In conjunction with the Naval Personnel Training Group (NPTG), the UWSU Project has initiated a Training Needs Analysis (TNA) during the Definition Phase, to be completed during Implementation Phase.	Information	N/A			
SRD-943	3.10.1.4 The training programs and the Training Systems and materials must be developed in a manner consistent with the TNA.	Mandatory	A			
SRD-934	3.10.1.5 The Training Systems delivered must implement the Canadian Forces Individual Training Education System (CFITES) methodology.	Mandatory	A			
SRD-935	3.10.1.6 The Training Systems methodology must include both conventional classroom format with provision for "hands-on" time.	Mandatory	A			
SRD-405	3.10.2 On-board Operator Training	Heading	N/A			
SRD-931	3.10.2.1 The Operator Training Capability must include all hardware, software and training materials for training Sonar Operators, Weapons Engineering Technicians and Underwater Warfare Directors as necessary to permit operation of the UWSS to meet the requirements of this SRD.	Mandatory	D			
SRD-982	3.10.2.2 The Operator Training Capability must replay recorded data, on-board.	Mandatory	D			
SRD-1191	3.10.2.3 The Operator Training Capability must use simulated scenarios for training.	Mandatory	D			

ID		Requirement Type	Compliance Demonstration Method	Bidder's Response	Evaluation of Bidder's Response	Compliant (Y/N)
SRD-936	3.10.2.4 An UWW operator team training capability must be embedded in the Halifax-class frigates by interfacing the UWSS OBT with the CMS 330 SETT and its environment, as a minimum, to deliver onboard training capability for Continuation Training (CT), and Operations Training (OT).	Mandatory	A			
SRD-408	3.10.2.5 The UDMS must provide real-time replay of previously recorded sensor data from all USCs, as selected by the operator.	Mandatory	A			
SRD-409	3.10.2.6 The UDMS must provide no less than two (2) times faster than real-time replay of previously recorded sensor data from every USC.	Mandatory	D			
SRD-410	3.10.2.7 The UDMS should provide no less than four (4) times faster than real-time replay of previously recorded sensor data from every USC.	Desirable	D			
SRD-971	3.10.2.8 The UDMS must conduct training in a fully realistic environment that can be altered by the SHOW (Senior hand of the watch) and the SETT acting as the game piece operator (GPO).	Mandatory	D			
SRD-1176	3.10.2.9 The UDMS must modify, as selected by the SHOW and the SETT acting as GPO, variables such as Fade in, Fade out, intermittent contact, and the frequencies shown in the passive mode.	Mandatory	D			
SRD-972	3.10.2.10 The UDMS must realistically display these simulated contacts inclusive of effects of Doppler, speed of the target, and the USC employed in the simulation.	Mandatory	D			
SRD-980	3.10.2.11 The ocean environment for the UDMS On-board operator synthetic training must not be modeled, but rather, the training system must be fully dependent on the GPO for the simulation of detection ranges.	Mandatory	D			
SRD-981	3.10.2.12 The ocean environment for the UDMS On-board operator synthetic training must be homogeneous.	Mandatory	D			

ID		Requirement Type	Compliance Demonstration Method	Bidder's Response	Evaluation of Bidder's Response	Compliant (Y/N)
SRD-973	3.10.2.13 The UDMS must conduct full operator training alongside and at sea with and without sensors deployed, and independently and in conjunction with the CMS.	Mandatory	D			
SRD-974	3.10.2.14 The Training System must define, save, edit, download and execute training scenarios and contacts.	Mandatory	D			
SRD-975	3.10.2.15 The UDMS must conduct training as a fully synthetic environment in a mode that is dependent on SETT for injects of targets and in a mode that is independent of SETT and CMS where the SHOW (Senior Hand Of the Watch) console may inject contacts and change the environment to suit training needs.	Mandatory	D			
SRD-1107	3.10.2.16 The Training System must support complete UDMS functionality while conducting training.	Mandatory	D			
SRD-1108	3.10.2.17 The Training System must not interfere with real-time operational function of the UDMS.	Mandatory	D			
SRD-1109	3.10.2.18 The Training System must be prevented from enabling active transmission on all USCs.	Mandatory	D			
SRD-1110	3.10.2.19 When the UDMS is conducting training, the UDMS must continuously indicate the components being used for training.	Mandatory	A			
SRD-406	3.10.3 Shore-based Operator Training	Heading	N/A			
SRD-937	3.10.3.1 A UWSS shore-based team training capability will be delivered at a later date as it is out of scope for this SRD. This capability will be delivered with the MRT Project (when implemented) at NFS(A) and NFS(P). As the UWSS is expected to receive frequent software and hardware updates, this training capability will be delivered in the form of a stimulated (vice emulated) equipment solution capable of interfacing with the Distributed Mission Operations Centre (DMOC) game master.	Information	N/A			

ID		Requirement Type	Compliance Demonstration Method	Bidder's Response	Evaluation of Bidder's Response	Compliant (Y/N)
SRD-1112	3.10.3.2 UWSS design and selection of technologies should be such as to ease transition to future training systems as described by the FNTSS and associated projects.	Desirable	D			
SRD-940	3.10.3.3 As an interim operator training capability, NFS(A) and (P) will utilize ships' embedded training in lieu of a shore-based operations trainer.	Information	N/A			
SRD-1026	3.10.3.4 Shore-based Operator Training should include Computer-based Training (CBT) as an interim means to develop basic operator proficiency.	Desirable	D			
SRD-1027	3.10.3.5 The CBT should maximize the use of the operational UDMS software.	Desirable	D			
SRD-407	3.10.4 Shore-based Maintainer Training	Heading	N/A			
SRD-939	3.10.4.1 The Maintainer Training Capability must include all hardware, software and training materials for training Weapons Engineering Technicians and Combat Systems Engineering Officers undergoing military occupation phase training as necessary to permit first-line maintenance of the UWSS to meet the requirements of this SRD.	Mandatory	D			
SRD-1029	3.10.4.2 Maintainer training capability must include a mix of classroom and emulated systems for all inboard processing systems, operator workstations, and sensor handling systems.	Mandatory	D			
SRD-1032	3.10.4.3 Emulated Maintainer training capability may be integrated into the existing Vista maintainer trainer.	Optional	D			
SRD-938	3.10.4.4 Maintainer training described in Section 3.10.4.3 will be conducted at NFS(A) in Halifax, Nova Scotia, and NFS(P) in Esquimalt, British Columbia.	Information	N/A			
SRD-	3.10.4.5 Maintainer training capability may include actual system	Optional	D			

ID		Requirement Type	Compliance Demonstration Method	Bidder's Response	Evaluation of Bidder's Response	Compliant (Y/N)
1030	components installed at a shore facility where it is deemed classroom and emulated systems are insufficient to develop adequate maintainer proficiency.					
SRD-1031	3.10.4.6 Maintainer training described in Section 3.10.4.5 will be conducted at NFS(A) in Halifax, Nova Scotia.	Information	N/A			
SRD-159	3.11 Post Mission Analysis Requirements	Heading	N/A			
SRD-984	3.11.1 The Post Mission Analysis capability delivered with the UWSS must provide analysis levels up to and including full level 4.	Mandatory	D			
SRD-983	3.11.2 The Post Mission Analysis capability must be integrated into the ADAC Digital Preview Processor system.	Mandatory	D			
SRD-160	3.12 Support, Tools and Test Equipment Requirements	Heading	N/A			
SRD-604	3.12.1 The support, tools and test equipment provided with the UWSS must provide full first-line maintenance support of the UWSS.	Mandatory	D			
SRD-600	3.12.2 The support, tools and test equipment provided with the UWSS must provide full second-line maintenance support of the USC wet-end sensors, namely:	Mandatory	D			
SRD-601	(a) the TAPS towed system, including all acoustic and non-acoustic sensors down to the LRU level, tow cables and connectors, and onboard handling and stowage systems;	Mandatory	D			
SRD-602	(b) the HMS sensor system, including all acoustic sensors down to the LRU level, cables and connectors, and onboard handling and stowage systems; and	Mandatory	D			
SRD-603	(c) the hull mounted TORSIC sensor system, including all acoustic sensors down to the LRU level, cables and connectors, and onboard handling and stowage systems.	Mandatory	D			

ID		Requirement Type	Compliance Demonstration Method	Bidder's Response	Evaluation of Bidder's Response	Compliant (Y/N)
SRD-599	3.12.3 The support, tools and test equipment provided with the UWSS must, for first and second line maintenance as described, include:	Mandatory	D			
SRD-605	(a) all specialized test equipment; and	Mandatory	D			
SRD-606	(b) all specialized shore-side handling equipment, including reelers;	Mandatory	D			
SRD-1251	3.13 Shore-based UWSS System for Combat Systems at Combat Systems Support Center (East)	Heading	N/A			
SRD-1252	3.13.1 General Requirements	Heading	N/A			
SRD-1253	3.13.1.1 The Shore-based UWSS System will consist of a combination of stimulators, emulators, simulators, shipboard-equivalent, and shipboard UWSS equipment to provide a fully functional and operational UWSS system with the identical capability, and identical or higher fidelity as the shipboard UWSS system for the purposes of:	Information	N/A			
SRD-1254	(a) Combat Systems development, test, and integration activities;	Information	N/A			
SRD-1255	(b) UWSS system test and trials, and integration activities; and	Information	N/A			
SRD-1256	(c) UWSS system software verification activities prior to installation on a shipboard UWSS system.	Information	N/A			
SRD-1257	3.13.1.2 The Shore-based UWSS System must include all hardware components, software components, associated cabling, mounting hardware, and racks.	Mandatory	A			
SRD-1258	3.13.1.3 The Shore-based UWSS System must be a fully functional and operational UWSS system with the identical capability as the shipboard UWSS system.	Mandatory	A			

ID		Requirement Type	Compliance Demonstration Method	Bidder's Response	Evaluation of Bidder's Response	Compliant (Y/N)
SRD-1259	3.13.1.4 The Shore-based UWSS System must have the identical or higher fidelity as the shipboard UWSS system.	Mandatory	A			
SRD-1260	3.13.1.5 The Shore-based UWSS System must maximize the re-use of shipboard hardware and software components such that the shore-based UWSS system can be used for:	Mandatory	A			
SRD-1261	(a) Combat Systems development, test, and integration activities;	Mandatory	A			
SRD-1262	(b) UWSS system test and trials, and integration activities; and	Mandatory	A			
SRD-1263	(c) UWSS system software verification activities prior to installation on a shipboard UWSS system.	Mandatory	A			
SRD-1264	3.13.1.6 The Shore-based UWSS System must reproduce all inputs the USCs would receive at sea.	Mandatory	A			
SRD-1265	3.13.1.7 The Shore-based UWSS System must interface with the Combat Systems synthetic environment at CSSC(E) to maintain an overall coordinated Combat Systems environment.	Mandatory	A			
SRD-1266	3.13.1.8 The Shore-based UWSS System must connect to the CMS 330 interface of the Combat Systems synthetic environment at CSSC(E).	Mandatory	A			
SRD-1267	3.13.1.9 The Shore-based UWSS System must connect to the NavDDS interface of the Combat Systems synthetic environment at CSSC(E).	Mandatory	A			
SRD-1272	3.13.2 Stimulated, Simulated, and Emulated UWSS Equipment	Heading	N/A			
SRD-1273	3.13.2.1 The Shore-based UWSS System must consist of a combination of stimulators, emulators, and simulators for each of the following UWSS equipment:	Mandatory	A			
SRD-	(a) Sonobuoy Processing System;	Mandatory	A			

ID		Requirement Type	Compliance Demonstration Method	Bidder's Response	Evaluation of Bidder's Response	Compliant (Y/N)
1274						
SRD-1275	(b) Hull Mounted Sonar System;	Mandatory	A			
SRD-1276	(c) Towed Active and Passive Sonar System;	Mandatory	A			
SRD-1277	(d) Hull Mounted Torpedo Sonar Intercept and Classification System; and	Mandatory	A			
SRD-1278	(e) Bathythermograph Recorder System.	Mandatory	A			
SRD-1279	3.13.2.2 The stimulated, emulated, and simulated UWSS equipment must reproduce all sensor inputs it receives, under control of the Combat Systems synthetic environment.	Mandatory	A			
SRD-1280	3.13.2.3 The stimulated, emulated, and simulated UWSS equipment must simulate all equipment faults that can be reported to the UDMS, under operator control.	Mandatory	A			
SRD-1281	3.13.2.4 The stimulated, emulated, and simulated UWSS equipment must maximize the re-use of shipboard hardware and software components.	Mandatory	A			
SRD-1282	3.13.3 Shipboard UWSS Equipment	Heading	N/A			
SRD-1283	3.13.3.1 The Shore-based UWSS System must consist of the following shipboard UWSS equipment:	Mandatory	A			
SRD-1284	(a) Underwater Data Management System; and	Mandatory	A			
SRD-1285	(b) All other miscellaneous shipboard UWSS equipment.	Mandatory	A			
SRD-1286	3.13.3.2 The shipboard UWSS equipment must be loaded and operated with shipboard software.	Mandatory	A			

ID		Requirement Type	Compliance Demonstration Method	Bidder's Response	Evaluation of Bidder's Response	Compliant (Y/N)
SRD-1287	3.13.4 Shipboard-Equivalent UWSS Equipment	Heading	N/A			
SRD-1288	3.13.4.1 The Shore-based UWSS System must consist of the following equipment with functional capability equivalent to shipboard UWSS equipment:	Mandatory	A			
SRD-1289	(a) Operator Workstations.	Mandatory	A			
SRD-1290	3.13.4.2 The shipboard-equivalent UWSS equipment must maximize the re-use of shipboard software.	Mandatory	A			
SRD-6	4 SPECIALTY ENGINEERING REQUIREMENTS	Heading	N/A			
SRD-32	4.1 Reliability, Availability, and Maintainability Requirements	Heading	N/A			
SRD-1194	4.1.1 A Halifax-class frigate could be deployed for up to 250 days per year in a high readiness state. When deployed, the ship will be required to perform tasks. These tasks will be performed continuously 24 hours per day for periods of up to 90 days.	Information	N/A			
SRD-40	4.1.2 The UWSS must perform continuous underway operation 24 hours per day to meet HR SSID mission requirements without system failure, where a failure is every event that adversely affects the mission.	Mandatory	D			
SRD-1193	4.1.3 Reliability	Heading	N/A			
SRD-1195	4.1.3.1 The UWSS must have a system reliability of greater than 95% for a mission lasting 90 days operating continuously 24 hours a day.	Mandatory	D			
SRD-1458	4.1.3.2 All UWSS Shore systems must each have a system reliability of 100% for a period of no less than 30 continuous days and an annual reliability of over 95% over 180 continuous days.	Mandatory	D			
SRD-	4.1.4 Availability	Heading	N/A			

ID		Requirement Type	Compliance Demonstration Method	Bidder's Response	Evaluation of Bidder's Response	Compliant (Y/N)
1196						
SRD-1197	4.1.4.1 The UWSS system availability must support deployments as defined in paragraph 4.1.1.	Mandatory	D			
SRD-1198	4.1.4.2 The UWSS system design must minimize single points of failure.	Mandatory	D			
SRD-1199	4.1.4.3 The loss of any one UWSS subsystem or USC must not cause the loss of the entire UWSS capability.	Mandatory	D			
SRD-1200	4.1.4.4 The UWSS must achieve no less than 99% availability, 24 hours a day, seven days a week, throughout a deployed period of up to 90 days.	Mandatory	D			
SRD-1205	4.1.4.5 The UWSS must be available for no less than 250 days per calendar year.	Mandatory	D			
SRD-1459	4.1.4.6 All UWSS Shore systems must each have an availability of no less than 180 days per calendar year.	Mandatory	D			
SRD-74	4.1.5 Maintainability	Heading	N/A			
SRD-1201	4.1.5.1 UWSS maintenance processes must consider the high level of self-sufficiency required by the ship for periods no less than, and sometimes exceeding, six months, where access to off-board spares and shore technical assistance will be unavailable for periods of up to 90 days.	Mandatory	D			
SRD-1202	4.1.5.2 The UWSS maintenance program must support a 60-month period of operation between major docking work periods.	Mandatory	D			
SRD-1203	4.1.5.3 UWSS System design and implementation must minimize maintenance requirements and minimize requirements for on-board spares.	Mandatory	D			
SRD-1204	4.1.5.4 The UWSS maintenance cycle must take into consideration the fact that a ship could be deployed for up to 250 days per year in	Mandatory	D			

ID		Requirement Type	Compliance Demonstration Method	Bidder's Response	Evaluation of Bidder's Response	Compliant (Y/N)
	a high readiness state.					
SRD-62	4.1.5.5 Each unit of the UWSS must be designed and fabricated using modular concepts for ease of maintenance, with low-level easily replaced modules and cards for all electronic functions.	Mandatory	D			
SRD-63	4.1.5.6 All subassemblies and Line Replaceable Units (LRUs) must be easily accessible and readily removable for repair.	Mandatory	A			
SRD-64	4.1.5.7 Keying or its equivalent must be used to prevent incorrect positioning of every module, connector, and printed circuit card.	Mandatory	A			
SRD-65	4.1.5.8 Positive stops must be provided on every hinged door and panel to lock it in the open position.	Mandatory	A			
SRD-66	4.1.5.9 For all equipment, a system ground strap must be provided, conforming to MIL-STD-1310E, for connecting to the vessel’s common ground bus.	Mandatory	A			
SRD-67	4.1.5.10 External incandescent status lights, if used, must be re-lampable from the front of the equipment in question.	Mandatory	A			
SRD-68	4.1.5.11 Normally-off lamps must have push-to-test or other similar test provisions, if applicable.	Mandatory	A			
SRD-168	4.1.5.12 Local maintainer interfaces must be provided as built-in components in each space in which UWSS is installed.	Mandatory	D			
SRD-169	4.1.5.13 Local maintainer interfaces should minimize the need to plug in external diagnostic devices such as laptop computers and specialized diagnostic tools.	Desirable	D			
SRD-399	4.1.5.14 The UWSS must include Built-in Test (BIT) functions to monitor for faults on all UWSS components down to the LRU level.	Mandatory	A			
SRD-398	4.1.5.15 To aid in the operator identification of bad sensor channels, BIT must include sensor level diagnostic displays for all USCs with the exception of the SPS.	Mandatory	A			
SRD-	4.1.5.16 Sensor level diagnostic BIT displays must provide a	Mandatory	A			

ID		Requirement Type	Compliance Demonstration Method	Bidder's Response	Evaluation of Bidder's Response	Compliant (Y/N)
400	continual colour map of integrated intensity versus frequency for each sensor channel.					
SRD-401	4.1.5.17 The integration period for the sensor BIT colour map must be operator selectable between one (1) and ten (10) seconds.	Mandatory	A			
SRD-1460	4.1.5.18 Design requirements for maintainability for UWSS Shipboard Systems must be applied to all UWSS Shore systems.	Mandatory	D			
SRD-75	4.1.6 Redundancy	Heading	N/A			
SRD-76	4.1.6.1 The UWSS must interact with every subsystem from each of the UWSS operator workstations in the Ops Room.	Mandatory	D			
SRD-1192	4.1.6.2 The UWSS must perform every function from each of the UWSS operator workstations in the Ops Room, under Operators and Maintainers control.	Mandatory	D			
SRD-77	4.1.6.3 Interfaces between UWSS components must be a dual redundant network, where failure of one network system will not disrupt the operations of the UWSS.	Mandatory	D			
SRD-404	4.1.6.4 Interfaces between UWSS and external systems should provide redundancy where possible.	Desirable	D			
SRD-78	4.1.6.5 Processing capacity in the UWSS must allow for assumption of processing load by alternate processors when failures occur.	Mandatory	D			
SRD-403	4.1.6.6 UWSS must redistribute the processing loads in the event of failure, under operator control.	Mandatory	D			
SRD-402	4.1.6.7 Redistribution of processing loads in the event of failure should be automatic.	Desirable	D			
SRD-33	4.2 Health and Safety Requirements	Heading	N/A			
SRD-1011	4.2.1 General	Heading	N/A			

ID		Requirement Type	Compliance Demonstration Method	Bidder's Response	Evaluation of Bidder's Response	Compliant (Y/N)
SRD-1012	4.2.1.1 The UWSS must be compliant with ANEP-77.	Mandatory	A			
SRD-1022	4.2.1.2 Safety features implemented for the UWSS to prevent damage to equipment must be disabled using a Battle-short capability, as selected by the operator.	Mandatory	D			
SRD-72	4.2.2 Hazardous Materials	Heading	N/A			
SRD-69	4.2.2.1 In accordance with MIL-HDBK-2036, the following materials must not be used in the shipboard and shore-based equipment: (a) Carcinogens; (b) Exposed glass fibers; (c) Lithium and lithium compounds, except batteries approved for the intended service conditions; (d) Magnesium and magnesium alloys; (e) Polyvinyl Chloride (PVC); (f) Radioactive materials; and (g) Zinc and zinc alloys.	Mandatory	A			
SRD-73	4.2.3 Electrical Hazards	Heading	N/A			
SRD-70	4.2.3.1 In accordance with MIL-HDBK-2036, UWSS shipboard and shore-based equipment must be designed such that personnel cannot be exposed to voltages in excess of 30 Volts Alternating Current (VAC).	Mandatory	A			
SRD-1173	4.2.3.2 In accordance with MIL-HDBK-2036, UWSS shipboard and shore-based equipment must be designed such that personnel cannot be exposed to voltages in excess of 60 Volts Direct Current (VDC).	Mandatory	A			
SRD-	4.2.3.3 All high voltage circuits must discharge to less than 30 volts	Mandatory	A			

ID		Requirement Type	Compliance Demonstration Method	Bidder's Response	Evaluation of Bidder's Response	Compliant (Y/N)
71	within two seconds of power being removed.					
SRD-484	4.3 System Security Requirements	Heading	N/A			
SRD-1015	4.3.1 General System Security Requirements	Heading	N/A			
SRD-948	4.3.1.1 The UWSS must protect assets, including technology, components and information, from compromise by implementing security solutions, as approved by Canada, and by meeting the security requirements and the security outcome requirements from the SOW, SRD, and UWSU System Security Requirements, Volume 2 Annex C Appendix 3 that mitigate risks posed by threats and vulnerabilities.	Mandatory	A			
SRD-947	4.3.1.2 The UWSS must protect assets by implementing security solutions, as approved by Canada, from CSEC ITSG-33 Annex 3A, Security Controls Catalogue for each security outcome requirement in the UWSU System Security Requirements, Volume 2 Annex C Appendix 3 and derived requirements from the system architecture design process.	Mandatory	A			
SRD-1447	4.3.1.3 Upon loading of an operational National Acoustic Library Database or upon processing of specific sensor or performance data, the UWSS will have a security classification of SECRET CANADIAN EYES ONLY. Unless otherwise determined or defined through the Security Working Group, the UWSS will at all other times have a security classification of CAN-SECRET.	Information	N/A			
SRD-949	4.3.2 Mission-Critical Functions Requirements	Heading	N/A			
SRD-950	4.3.2.1 For the components of the mission-critical functions, the UWSS must establish basic protection requirements unless justified	Mandatory	A			

ID		Requirement Type	Compliance Demonstration Method	Bidder's Response	Evaluation of Bidder's Response	Compliant (Y/N)
	by a cost-benefit analysis approved by Canada.					
SRD-951	4.3.2.2 Those basic protections must consist of:	Mandatory	A			
SRD-953	(a) Establish least privilege using distrustful decomposition (privilege reduction) or a similar approach to move mission-critical functions into separate mutually untrusting programs (see CMU/SEI-2009-TR-010, Secure Design Patterns);	Mandatory	A			
SRD-954	(b) Physical and logical diversification of critical components for mission-critical functions that require redundancy to meet reliability and safety requirements;	Mandatory	A			
SRD-955	(c) Physical and logical diversification with voting to establish trustworthiness of selected mission-critical function components;	Mandatory	A			
SRD-956	(d) Wrappers for pre-existing COTS, MOTS, and legacy software to enforce strong typing, context checking and other interface validation methods for interfaces with mission-critical functions (see CMU/SEI-2009-TR-010, Secure Design Patterns); and	Mandatory	A			
SRD-957	(e) Wrappers for pre-existing COTS, MOTS, and legacy software to identify and log invalid interface data using secure logging approaches (see CMU/SEI-2009-TR-010, Secure Design Patterns).	Mandatory	A			
SRD-35	4.4 Supportability Requirements	Heading	N/A			
SRD-36	4.4.1 The UWSS must have a life expectancy through to the end of life of the Halifax-class.	Mandatory	A			
SRD-38	4.4.2 The UWSS must be designed using COTS components and commercial standards to accommodate ongoing and continuous	Mandatory	D			

ID		Requirement Type	Compliance Demonstration Method	Bidder's Response	Evaluation of Bidder's Response	Compliant (Y/N)
	obsolescence management and periodic technology refresh.					
SRD-37	4.4.3 The UWSS must be designed with open architecture principles that accommodate upgrades of hardware and software components.	Mandatory	D			
SRD-7	5 ENVIRONMENTAL REQUIREMENTS	Heading	N/A			
SRD-34	5.1 Ship's motion and Sea State	Heading	N/A			
SRD-60	5.1.1 The UWSS shipboard equipment must remain fully operational for all vessel motion and attitude conditions in accordance with MIL-STD-1399, Section 301.	Mandatory	A			
SRD-48	5.1.2 The UWSS shipboard equipment must have a sustained full operational capability in conditions no less than the upper limit of Sea State 5.	Mandatory	A			
SRD-49	5.1.3 The UWSS shipboard equipment must have a sustained full operational capability at all ship's speeds from zero (0) to $MAX_OWNSHIP_SPEED$ knots and turn rates from zero (0) to $MAX_OWNSHIP_TURNRATE$ degrees per second in either direction at that maximum speed, for a period of no less than 30 minutes.	Mandatory	D			
SRD-47	5.1.4 The UWSS shipboard equipment must survive conditions no less than Sea State 8.	Mandatory	A			
SRD-737	5.1.5 The TAPS towed system, while deployed, must survive conditions no less than Sea State 6.	Mandatory	A			
SRD-740	5.1.6 The TAPS towed system, while deployed, must survive external pressures equivalent to being hung vertically from the ship at maximum cable scope.	Mandatory	A			
SRD-41	5.2 Mechanical Shock	Heading	N/A			
SRD-	5.2.1 The UWSS shipboard equipment must be qualified to the	Mandatory	A			

ID		Requirement Type	Compliance Demonstration Method	Bidder's Response	Evaluation of Bidder's Response	Compliant (Y/N)
51	Grade A Class II shock loading requirements for deck mounted equipment, as specified in MIL-S-901.					
SRD-52	5.2.2 Shock isolators may be fitted as part of the UWSS to meet the above requirement and, if used, these must be supplied with each shipboard equipment delivered, as appropriate.	Mandatory	A			
SRD-42	5.3 Vibration	Heading	N/A			
SRD-50	5.3.1 The UWSS must meet the requirements for Type I tests, as specified in MIL-STD-167-1A.	Mandatory	A			
SRD-53	5.4 Acoustic Noise	Heading	N/A			
SRD-54	5.4.1 The UWSS must meet the requirements for Grade A3 equipment as specified in MIL-STD-1474 Section 5.0.	Mandatory	A			
SRD-55	5.5 Structure Borne Noise	Heading	N/A			
SRD-56	5.5.1 The UWSS must meet the requirements for Type III equipment as specified in MIL-STD-740-2.	Mandatory	A			
SRD-43	5.6 Electromagnetic Effects	Heading	N/A			
SRD-58	5.6.1 The UWSS equipment must meet the requirements of MIL-STD-461F for surface ship installed equipment.	Mandatory	A			
SRD-59	5.6.2 Filters may be included as part of the shipboard equipment to meet the above requirement and, if used, must be supplied with each UWSS shipboard equipment installation, as appropriate.	Mandatory	A			
SRD-57	5.6.3 The UWSS shipboard equipment must operate and not be harmed when within magnetic fields, as follows: (a) Operating - 5 Gauss; (b) Non-operating - 30 Gauss; and	Mandatory	A			

ID		Requirement Type	Compliance Demonstration Method	Bidder's Response	Evaluation of Bidder's Response	Compliant (Y/N)
	(c) Storage - 30 Gauss.					
SRD-44	5.7 Temperature, Humidity, Wind and Solar Radiation	Heading	N/A			
SRD-738	5.7.1 The TAPS towed system must remain operable in water temperatures between -2 and +35 degrees Celsius.	Mandatory	A			
SRD-1103	5.7.2 The TAPS including handling and stowage system must remain operable in air temperatures between -2 and +50 degrees Celsius.	Mandatory	A			
SRD-739	5.7.3 The TAPS towed system must be stored in temperatures between -40 and +50 degrees Celsius without damage.	Mandatory	A			
SRD-1446	5.7.4 The UWSS components exposed at any time to weather during deployment, operation and retrieval must continue to function in accordance with all requirements of this SRD under all conditions as specified in paragraphs 3.1.1.1.2 and 3.1.1.1.3 of this SRD.	Mandatory	A			
SRD-1002	5.7.5 The UWSS components exposed to the weather must operate in accordance with this SRD when exposed to the solar environment described in MIL-STD-810G, method 505.5 Procedure II.	Mandatory	A			
SRD-1003	5.7.6 The UWSS must operate in accordance with this SRD in a 95% humidity condensing environment.	Mandatory	A			
SRD-995	5.8 Rainfall, Dust and Spray	Heading	N/A			
SRD-996	5.8.1 The UWSS components exposed to the weather must operate in accordance with this SRD under rainfall conditions of 0.8 millimeters per minute.	Mandatory	A			
SRD-997	5.8.2 The UWSS components exposed to the weather must operate in accordance with this SRD under dust concentrations of 1 gram per cubic meter.	Mandatory	A			
SRD-998	5.8.3 The UWSS components located in a sheltered environment must operate in accordance with this SRD when in a drip	Mandatory	A			

ID		Requirement Type	Compliance Demonstration Method	Bidder's Response	Evaluation of Bidder's Response	Compliant (Y/N)
	environment as identified in MIL-STD-810G, method 506.5, Procedure III.					
SRD-999	5.8.4 The UWSS components that are exposed to sea water and weather must be watertight, spray tight, and dust proof in accordance with MIL-STD-108E.	Mandatory	A			
SRD-45	5.9 Ice	Heading	N/A			
SRD-993	5.9.1 The UWSS components that are exposed to weather must operate in accordance with this SRD when subjected to conditions that produce icing loads of no less than 20 kilograms per square meter.	Mandatory	A			
SRD-994	5.9.2 The UWSS components that are exposed to weather must not be damaged by an icing load of no less than 37 kilograms per square meter.	Mandatory	A			
SRD-46	5.10 Corrosion	Heading	N/A			
SRD-991	5.10.1 The UWSS components that are exposed to sea water and weather must be constructed from galvanic compatible materials.	Mandatory	A			
SRD-992	5.10.2 The UWSS components that are exposed to sea water and weather must be constructed from materials with surface treatments in order to preclude failure due to oxidation and corrosion.	Mandatory	A			
SRD-1206	6 Fitted-For-But-Not-With Requirements (FFBNW)	Heading	N/A			
SRD-1207	6.1 All requirements as prescribed for in this SRD and its applicable annexes and appendices must apply for all FFBNW capabilities and ship-sets unless specifically otherwise stated within this section of this SRD.	Mandatory	A			

ID		Requirement Type	Compliance Demonstration Method	Bidder's Response	Evaluation of Bidder's Response	Compliant (Y/N)
SRD-1208	6.2 FFBNW Training and Torpedo Detection (FFBNW-TT)	Heading	N/A			
SRD-1209	6.2.1 Definition	Heading	N/A			
SRD-1210	6.2.1.1 This option will result in ship(s) receiving a torpedo detection capability, the ship embedded training, and the infrastructure required to rapidly transfer and receive all missing full-up ship-set equipment and components.	Information	N/A			
SRD-1211	6.2.2 Components	Heading	N/A			
SRD-1212	6.2.2.1 This option must include the following full-up UWSU solution components being replaced, upgraded and installed, in full accordance with their applicable respective sections of this SRD:	Mandatory	D			
SRD-1245	(a) Hull Mounted Sonar System (SRD Section 3.3);	Mandatory	D			
SRD-1213	(b) Hull Mounted TORSIC (SRD Section 3.5);	Mandatory	D			
SRD-1214	(c) TORSIC (SRD Section 3.9.2.4);	Mandatory	D			
SRD-1215	(d) SPS (SRD Section 3.6);	Mandatory	D			
SRD-1216	(e) Bathythermograph Recorder (SRD Section 3.7);	Mandatory	D			
SRD-1217	(f) Operator Workstations (SRD Section 3.1.1.4);	Mandatory	D			
SRD-1218	(g) Interfaces and Cabling (SRD Section 3.1.1.5);	Mandatory	D			
SRD-	(h) Elements of the Underwater Data Management	Mandatory	D			

ID		Requirement Type	Compliance Demonstration Method	Bidder's Response	Evaluation of Bidder's Response	Compliant (Y/N)
1219	System (UDMS) as described in Section 6.2.2.2; and					
SRD-1220	(i) All required equipment, equipment modifications, racks, material, cabling, and miscellaneous infrastructure that require more than one month to fully install, set-to-work, integrate, and test.	Mandatory	D			
SRD-1221	6.2.2.2 Elements of the full-up UDMS ship-set solution must be included and installed under this option in order to fully support the components described in Section 6.2.2, with full accordance to their respective applicable component requirements as defined in SRD Section 3.9 and elsewhere in this SRD.	Mandatory	D			
SRD-1222	6.2.3 Performance	Heading	N/A			
SRD-1223	6.2.3.1 Performance Against Torpedoes	Heading	N/A			
SRD-1224	6.2.3.1.1 The UWSU solution and components delivered and installed under this option must all meet their respective individual component performance contributions towards the full-up solution meeting performance against torpedoes requirements defined under SRD Section 3.2.3.	Mandatory	D			
SRD-1225	6.2.3.2 Performance Against Torpedoes Active Sonar	Heading	N/A			
SRD-1226	6.2.3.2.1 The UWSU solution and components delivered and installed under this option must all meet their respective individual component performance contributions towards the full-up solution meeting performance against torpedoes active sonar requirements defined under SRD Section 3.2.4.	Mandatory	D			
SRD-1227	6.2.3.3 Performance Requirement for Submarine Search and Rescue	Heading	N/A			

ID		Requirement Type	Compliance Demonstration Method	Bidder's Response	Evaluation of Bidder's Response	Compliant (Y/N)
SRD-1228	6.2.3.3.1 The UWSU solution and components delivered and installed under this option must all meet their respective individual component performance contributions towards the full-up solution meeting performance requirements for Submarine Search and Rescue defined under SRD Section 3.2.6.	Mandatory	D			
SRD-1488	6.2.3.4 Performance Requirement for Transient Detection	Heading	N/A			
SRD-1489	6.2.3.4.1 The UWSU solution and components delivered and installed under this option must all meet their respective individual component performance contributions towards the full-up solution meeting performance requirements for Transient Detection defined under SRD Section 3.2.7.	Mandatory	D			
SRD-1490	6.2.3.5 Performance Requirement for Marine Mammal Detection	Heading	N/A			
SRD-1492	6.2.3.5.1 The UWSU solution and components delivered and installed under this option must all meet their respective individual component performance contributions towards the full-up solution meeting performance requirements for Marine Mammal Detection defined under SRD Section 3.2.8.	Mandatory	D			
SRD-1229	6.2.3.6 Training	Heading	N/A			
SRD-1230	6.2.3.6.1 The UWSU solution and components delivered and installed under this option must meet all Training requirements defined under SRD Section 3.10.	Mandatory	D			
SRD-1231	6.2.3.7 Transferability	Heading	N/A			
SRD-1232	6.2.3.7.1 It must be possible to fully install, integrate, set-to-work and test the missing components from this option, in difference	Mandatory	D			

ID		Requirement Type	Compliance Demonstration Method	Bidder's Response	Evaluation of Bidder's Response	Compliant (Y/N)
	from a full-up ship-set solution, within one month.					
SRD-1233	6.3 FFBNW Wires and Racks (FFBNW-WR)	Heading	N/A			
SRD-1234	6.3.1 Definition	Heading	N/A			
SRD-1235	6.3.1.1 This option will result in the removal of all non-UWSU related legacy ASW equipment and the installation of the infrastructure required to rapidly transfer and receive all missing full-up ship-set equipment and components.	Information	N/A			
SRD-1236	6.3.2 Components	Heading	N/A			
SRD-1237	6.3.2.1 This option must include the following components to be replaced, upgraded, and installed, in full accordance with their applicable respective sections of this SRD:	Mandatory	D			
SRD-1238	(a) Interfaces and Cabling (SRD Section 3.1.1.5);	Mandatory	D			
SRD-1239	(b) All required equipment, equipment modifications, racks, material or cabling and miscellaneous infrastructure that requires more than one month to fully install, set-to-work, integrate, and test; and	Mandatory	D			
SRD-1240	(c) A standalone set of computers to fully support Computer Based Training (CBT) requirements as prescribed in Section 6.3.3.1, as mandatory vice desirable.	Mandatory	D			
SRD-1241	6.3.3 Training	Heading	N/A			
SRD-1242	6.3.3.1 This option must include a standalone set of computers to support an onboard CBT solution as a mandatory requirement vice a	Mandatory	D			

ID		Requirement Type	Compliance Demonstration Method	Bidder's Response	Evaluation of Bidder's Response	Compliant (Y/N)
	desirable, as defined in SRD Section 3.10.3.4.					
SRD-1243	6.3.4 Transferability	Heading	N/A			
SRD-1244	6.3.4.1 It must be possible to fully install, set-to-work, integrate, and test the missing components from this option, in difference from a full-up ship-set solution, within one month.	Mandatory	D			

ID		Requirement Type	Compliance Demonstration Method	Bidder's Response	Evaluation of Bidder's Response	Compliant (Y/N)
DCR-1	Volume 1, Annex D, Appendix 10 to W8472-135462 Bid Evaluation Plan - Compliance Matrix: System Requirements Document - Data Collection Requirements Dated: 10 February 2017	Heading	N/A			
DCR-382	Volume 1, Annex D, Appendix 10 Bid Evaluation Plan Compliance Matrix: System Requirements Document Data Collection Requirements Underwater Warfare Suite Upgrade 10 February 2017	Heading	N/A			
DCR-342	1 Data Collection Requirements	Heading	N/A			
DCR-2	1.1 Data Collection General Requirements	Heading	N/A			
DCR-5	1.1.1 The Data Recording, Replay and Management System (DRRMS) must collect data automatically.	Mandatory	D			
DCR-6	1.1.2 The DRRMS must collect:	Mandatory	D			
DCR-377	(a) Raw acoustic data that is collected from the USCs;	Mandatory	D			
DCR-379	(b) Raw non-acoustic data that is collected from the USCs, other sensors and the CMS 330, including UWSS configuration information; and	Mandatory	D			
DCR-	(c) Raw video from workstation displays.	Mandatory	D			

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DCR-8	1.1.3 The DRRMS recorded data must be timestamped with a millisecond precision or higher at the time of collection representing the point in time the data was collected.	Mandatory	A			
DCR-198	1.1.4 The DRRMS collected data must be timestamped with a millisecond precision or higher with time of validity representing when the data is valid or first in use on the system.	Mandatory	A			
DCR-199	1.1.5 The DRRMS collected data must include all data required to unambiguously recreate the series of recorded data.	Mandatory	A			
DCR-9	1.1.6 The DRRMS must store no less than 36 hours of immediately accessible data in random access storage.	Mandatory	D			
DCR-10	1.1.7 The DRRMS must provide access to the immediately preceding 36 hours of collected data.	Mandatory	D			
DCR-11	1.1.8 The DRRMS must store collected data on removable storage media.	Mandatory	D			
DCR-12	1.1.9 The DRRMS must store collected data with security classification of SECRET CANADIAN EYES ONLY on a separate removable storage media than data collected with security classification other than SECRET CANADIAN EYES ONLY.	Mandatory	D			
DCR-14	1.1.10 The DRRMS removable storage media must be easily accessible by operators.	Mandatory	D			
DCR-15	1.1.11 The DRRMS must enable the user to remove and replace the removable media without interrupting the continuous recording operation of DRRMS.	Mandatory	D			
DCR-16	1.1.12 The DRRMS must collect data simultaneously and continuously at a maximum data output rate for a period of no less than 72 hours without operator intervention to remove and replace the removable storage media.	Mandatory	D			
DCR-17	1.1.13 The DRRMS must meet its performance requirements while operating simultaneously with the UDMS non-DRRMS functions.	Mandatory	D			
DCR-	1.1.14 The DRRMS must have a means for personnel to remove the	Mandatory	D			

18	recorded data.					
DCR-380	1.1.15 The DRRMS must have a means to export selected recorded data.	Mandatory	D			
DCR-19	1.1.16 The DRRMS must have an interface to provide personnel access to the exported data using a means compliant with the derived security requirements for the UWSS.	Mandatory	D			
DCR-385	1.1.17 The DRRMS must collect the necessary data with sufficient fidelity to support the Post-Mission Analysis Requirements in Section 3.11 of Volume 2, Annex C, System Requirements Document.	Mandatory	A			
DCR-21	1.2 Data Collection Configuration	Heading	N/A			
DCR-22	1.2.1 The UDMS must control the configuration of the DRRMS.	Mandatory	A			
DCR-23	1.2.2 The UDMS must manage the DRRMS configuration parameters as entered by the user.	Mandatory	A			
DCR-24	1.3 Data Collection Alarms	Heading	N/A			
DCR-25	1.3.1 The UDMS must send an alert to the user when the removable storage media usage exceeds a predefined threshold specified by the user.	Mandatory	A			
DCR-26	1.3.2 The UDMS must send an alarm to the user when the removable storage media usage reaches full capacity.	Mandatory	A			
DCR-32	1.4 Data Collection Video Requirements	Heading	N/A			
DCR-34	1.4.1 The DRRMS must accept input video sources from all UWSS Operator consoles.	Mandatory	D			
DCR-35	1.4.2 The DRRMS must record console video sources simultaneously, as selected by the operator.	Mandatory	D			
DCR-201	1.5 Data Collection Captured Screen Image Requirements	Heading	N/A			
DCR-	1.5.1 The DRRMS must allow the operators to capture screen images	Mandatory	D			

202	from all UWSS Operator consoles.					
DCR-203	1.5.2 The DRRMS must annotate the captured screen images with originating source (UWSS Operator console), the time and date and ship's location.	Mandatory	D			
DCR-204	1.5.3 The DRRMS must record the annotated captured screen images, as selected by the operator.	Mandatory	A			
DCR-36	1.6 Data Collection Raw Acoustic Data Requirements	Heading	N/A			
DCR-37	1.6.1 The DRRMS must accept input from acoustic sources from all USCs.	Mandatory	D			
DCR-38	1.7 Data Collection File Management Requirements	Heading	N/A			
DCR-39	1.7.1 The DRRMS must allow the user to manage recorded data through user created files.	Mandatory	D			
DCR-40	1.7.2 The DRRMS must allow the user to manage exported processed data through user created files.	Mandatory	D			
DCR-42	1.8 Data Collection Playback Requirements	Heading	N/A			
DCR-43	1.8.1 The DRRMS must provide onboard playback of recorded acoustic and non-acoustic sources.	Mandatory	D			
DCR-44	1.8.2 The DRRMS must provide onboard playback of recorded video sources.	Mandatory	D			
DCR-45	1.8.3 The DRRMS must allow shipboard data analysis that enables the user to select, replay and edit captured video data.	Mandatory	D			
DCR-205	1.8.4 The DRRMS must display captured screen images.	Mandatory	D			
DCR-46	1.8.5 The DRRMS must display non-acoustic recorded data in decoded format.	Mandatory	D			
DCR-47	1.8.6 The DRRMS must provide onboard playback of recorded raw acoustic data on USCs.	Mandatory	D			
DCR-	1.8.7 The UDMS must playback and reprocess recorded raw acoustic	Mandatory	D			

48	data simultaneously while the UWSS is in Operational mode.					
DCR-168	1.9 Data Collection Data Requirements	Heading	N/A			
DCR-174	1.9.1 The DRRMS must record all data specified in the Kinematics Data Table.	Mandatory	A			
DCR-176	1.9.2 The DRRMS must record all data specified in the Environmental Data Table.	Mandatory	A			
DCR-182	1.9.3 The DRRMS must record all data specified in the Tactical Data Table.	Mandatory	A			
DCR-177	1.9.4 The DRRMS must record all data specified in the Communications Data Table.	Mandatory	A			
DCR-178	1.9.5 The DRRMS must record all data specified in the Marine Systems Data Table.	Mandatory	A			
DCR-179	1.9.6 The DRRMS must record all data specified in the Operator and HMI Data Table.	Mandatory	A			
DCR-180	1.9.7 The DRRMS must record all data specified in the Sensor Control Data Table.	Mandatory	A			
DCR-181	1.9.8 The DRRMS must record all data specified in the Sonar Hardware Data Table.	Mandatory	A			
DCR-349	1.10 External Interface to Post-Mission Analysis Systems	Heading	N/A			
DCR-350	1.10.1 Introduction	Heading	N/A			
DCR-351	1.10.1.1 The InterMAP generic parsing tool, along with the InterMAP autogen toolset is used by the Canadian Forces Maritime Warfare Centre (CFMWC) to parse the data collected by data collection systems in support of post-mission analysis.	Information	N/A			
DCR-352	1.10.1.2 The InterMAP autogen tool has been used to auto generate source code from numerous header file formats such as C++ headers, Extensible Markup Language (XML) data structures such as high-level architecture (HLA) federation models, Real-Time	Information	N/A			

	Innovations (RTI) Data Distribution Service (DDS) Interface Definition Language (IDL) and Google Protocol Buffer proto files.					
DCR-358	1.10.1.3 C++ header files or Google Protocol Buffer proto files format are the preferred formats.	Information	N/A			
DCR-353	1.10.1.4 Since CFMWC will be using InterMAP to parse the DRRMS data files, CFMWC will require an offboard software parser source code or dynamic link libraries.	Information	N/A			
DCR-354	1.10.1.5 CFMWC will integrate and incorporate the parser source code or dynamic link libraries into the InterMap autogen toolset.	Information	N/A			
DCR-355	1.10.2 Data Collection External Interface Requirements	Heading	N/A			
DCR-356	1.10.2.1 The DRRMS data file data contents must be in a data structure format that can be specified in one of the following formats:	Mandatory	D			
DCR-362	(a) C++ header files;	Mandatory	A			
DCR-363	(b) Google Protocol Buffer proto files;	Mandatory	A			
DCR-364	(c) RTI DDS IDL files; or	Mandatory	A			
DCR-365	(d) XML data structures, including all XML Schema Definition (XSD) files and all extra content required to interpret the XML.	Mandatory	A			
DCR-359	1.10.3 Data Collection Standalone Parser Requirements	Heading	N/A			
DCR-360	1.10.3.1 The UDMS software must include standalone software source code or dynamic link libraries that can parse and decode the contents of DRRMS data files.	Mandatory	D			
DCR-366	1.10.3.2 This standalone source code or dynamic link libraries must be in a compatible format such that it can be integrated and incorporated with InterMap autogen toolset on a laptop or	Mandatory	D			

	computer.					

Kinematics Data Table

Name	Description	Origin of Data	Data type	Precision	Sampling and Recording Period	Data size	Requirement Type
KINEMATIC DATA							
Ship's heading	degrees	Navigation Data Distribution System	Binary	In accordance with Navigation Data Distribution System	In accordance with Navigation Data Distribution System	In accordance with Navigation Data Distribution System	Mandatory
Ship's attitude data	pitch, yaw, roll	Navigation Data Distribution System	Binary	In accordance with Navigation Data Distribution System	In accordance with Navigation Data Distribution System	In accordance with Navigation Data Distribution System	Mandatory
Ship's speed	knots	Navigation Data Distribution System	Binary	In accordance with Navigation Data Distribution System	In accordance with Navigation Data Distribution System	In accordance with Navigation Data Distribution System	Mandatory
Ship's position	latitude and longitude	Navigation Data Distribution System	Binary	In accordance with Navigation Data Distribution System	In accordance with Navigation Data Distribution System	In accordance with Navigation Data Distribution System	Mandatory
Ship's GPS data	Inertial Navigational System data, Inertial Measurement Unit data, and GPS receiver data	Navigation Data Distribution System	Binary	In accordance with Navigation Data Distribution System	In accordance with Navigation Data Distribution System	In accordance with Navigation Data Distribution System	Desirable
Ship's precision time data	YY:HH:MM:ss.mmm where: YY = Last two digits of year (00-99), HH = hours in 24 hour format (00-23), MM = minutes (00-59), ss = seconds(00-59), and mmm = milliseconds (000-999).	Navigation Data Distribution System	Binary	In accordance with Navigation Data Distribution System	In accordance with Navigation Data Distribution System	In accordance with Navigation Data Distribution System	Mandatory

Environmental Data Table

Name	Description	Origin of Data	Data type	Precision	Sampling and Recording Period	Data size	Requirement Type
ENVIRONMENTAL DATA							
Sound velocity profile (1) The three Sound Velocity Profile collection methods are required.	Sound velocity profile and temperature profile	Mk8(F) bathythermograph	In accordance with proprietary Mk8(F) .edf and .rdf file	In accordance with proprietary Mk8(F) bathythermograph .edf and .rdf file formats	Whenever data is received from the Origin of Data by the UWSS. Data collected must have: (i) timestamp when the data is received by the UWSS; and (ii) timestamp at Time of Collection (which may have been hours or days earlier).	In accordance with proprietary Mk8(F) bathythermograph .edf and .rdf file formats	Mandatory
Sound velocity profile (2) The three Sound Velocity Profile collection methods are required.	Sound velocity profile and temperature profile	Bathythermograph sonobuoy	In accordance with SSQ-536 Bathythermograph Sonobuoy (and variants)	In accordance with processed outputs of SSQ-536 Bathythermograph Sonobuoy (and variants)	Whenever data is received from the Origin of Data by the UWSS. Data collected must have: (i) timestamp when the data is received by the UWSS and (ii) timestamp at Time of Collection (which may have been hours or days earlier).	In accordance with SSQ-536 Bathythermograph Sonobuoy (and variants)	Mandatory

Sound velocity profile (3) The three Sound Velocity Profile collection methods are required.	Sound velocity profile and temperature profile	Import files on digital media in accordance to Section 3.9.12 Acoustic Range Prediction of the SRD	In accordance with Origin of Data	In accordance with Origin of Data	Whenever the database is loaded into the UWSS. Data collected must have: (i) timestamp when the data is loaded into the UWSS; (ii) timestamp at Time of Collection (data may have been measured hours or days earlier); and (iii) name, version, and date of the database.	In accordance with Origin of Data	Mandatory
Sound velocity, temperature, depth data (at sensor location)	In situ live measurements	Heading, Depth, and Temperature Module (HDTM) and hydrophones	Binary	In accordance with Origin of Data	1 second or more frequent	In accordance with Origin of Data	Mandatory

Water temperature profile	degree Celsius (°C)	Import files on digital media in accordance to Section 3.9.12 Acoustic Range Prediction of the SRD	In accordance with Origin of Data	In accordance with Origin of Data	Whenever database is loaded into the UWSS. Data collected must have: (i) timestamp when the data is loaded into the UWSS; (ii) timestamp at Time of Collection (data may have been measured hours or days earlier) for individual SVP points being referenced in a search/prediction area; and (iii) name, version and date of the database.	In accordance with Origin of Data	Mandatory

Water salinity profile	parts per thousand (ppt)	Import files on digital media in accordance to Section 3.9.12 Acoustic Range Prediction of the SRD	In accordance with Origin of Data	In accordance with Origin of Data	Whenever the database is loaded into the UWSS. Data collected must have: (i) timestamp when the data is loaded into the UWSS; (ii) timestamp at Time of Collection (data may have been measured hours or days earlier); and (iii) name, version, and date of the database.	In accordance with Origin of Data	Desirable
Water depth (from keel)	metres (m)	Echo Sounder via Navigation Data Distribution System	In accordance with Origin of Data	In accordance with Navigation Data Distribution System	In accordance with Navigation Data Distribution System	In accordance with Navigation Data Distribution System	Mandatory

Bottom type	High-Frequency Environment Acoustic (HFEVA)	Import files on digital media in accordance to Section 3.9.12 Acoustic Range Prediction of the SRD	In accordance with Origin of Data	In accordance with Origin of Data	Whenever the database is loaded into the UWSS. Data collected must have: (i) timestamp when the data is loaded into the UWSS; (ii) timestamp at Time of Collection (data may have been measured hours or days earlier); and (iii) name, version, and date of the database.	In accordance with Origin of Data	Mandatory
Air Temperature profile	degrees Celsius (°C)	Import files on digital media in accordance to Section 3.9.12 Acoustic Range Prediction of the SRD	In accordance with Origin of Data	In accordance with Origin of Data	Whenever the database is loaded into the UWSS. Data collected must have: (i) timestamp when the data is loaded into the UWSS; (ii) timestamp at Time of Collection (data may have been measured hours or days earlier); and (iii) name, version, and date of the database.	In accordance with Origin of Data	Desirable

Air humidity profile	percent (%)	Import files on digital media in accordance to Section 3.9.12 Acoustic Range Prediction of the SRD	In accordance with Origin of Data	In accordance with Origin of Data	Whenever the database is loaded into the UWSS. Data collected must have: (i) timestamp when the data is loaded into the UWSS; (ii) timestamp at Time of Collection (data may have been measured hours or days earlier); and (iii) name, version, and date of the database.	In accordance with Origin of Data	Desirable
Wind speed, corrected to a height of 10 m	knots	Anemometers via Navigation Data Distribution System	In accordance with Navigation Data Distribution System	In accordance with Navigation Data Distribution System	In accordance with Navigation Data Distribution System	In accordance with Navigation Data Distribution System	Mandatory
Wind Heading	degrees true	Anemometers via Navigation Data Distribution System	In accordance with Navigation Data Distribution System	In accordance with Navigation Data Distribution System	In accordance with Navigation Data Distribution System	In accordance with Navigation Data Distribution System	Desirable
Water depth (at sensor depth)	metres (m)	Sensor	Binary	In accordance with Navigation Data Distribution System	In accordance with Navigation Data Distribution System	In accordance with Navigation Data Distribution System	Mandatory

Weather - rain areas		Ship's Meteorological Reports	In accordance with Origin of Data	In accordance with Origin of Data	Whenever the report is loaded into the UWSS. Data collected must have: (i) timestamp when the data is received by the UWSS; (ii) timestamp at Time of Collection (which may have been hours or days earlier when the meteorological report was created); and (iii) name, version, and date of the report.	In accordance with Origin of Data	Desirable
Ambient noise measurements	360 degrees ambient noise measurements on 10 degrees radial values	Ambient Noise Buoy or Sensor	In accordance with Origin of Data	In accordance with processed outputs of SSQ-536 or 53G Sonobuoys and/or ambient noise measurement of OEM sensor	Whenever data is received from the Origin of Data by the UWSS. Data collected must have: (i) timestamp when the data is received by the UWSS; and (ii) timestamp at Time of Collection (which may have been hours or days earlier).	In accordance with Origin of Data	Mandatory

UW acoustic range prediction results and input parameters including worldwide bathymetry and climatology		UWSS and Import files on digital media in accordance to Section 3.9.12 Acoustic Range Prediction of the SRD	In accordance with Origin of Data	In accordance with Origin of Data	In accordance with Origin of Data; and Whenever the database is loaded into the UWSS. Data collected must have: (i) timestamp when the data is received by the UWSS; (ii) timestamp at Time of Production (which may have been hours or days earlier when the acoustic predictions were created); and (iii) name, version, and date of the database.	In accordance with Origin of Data	Mandatory

Tactical Data Table

Name	Description	Origin of Data	Data type	Precision	Sampling and Recording Period	Data size	Requirement Type
TACTICAL DATA							
Tactical plot data	Tracks, dead reckoning tracks, area of probabilities (AOPs), bearing lines, circles, arcs, and zones	UWSS, Navigation Data Distribution System and Combat Management System 330	In accordance with Origin of Data	In accordance with Origin of Data	1 second or more frequent	In accordance with Origin of Data	Mandatory
Deployment location and time of drop, type and Radio Frequency (RF) channel, sensor depth, and lifetime of all active and passive sonobuoys		UWSS and Combat Management System 330	In accordance with Origin of Data	In accordance with Origin of Data	Whenever a state change occurs; and Whenever data is received from the Origin of Data by the UWSS	In accordance with Origin of Data	Mandatory
Deployment time and type of any expendable Acoustic Countermeasures		Combat Management System 330	In accordance with Origin of Data	In accordance with Origin of Data	Whenever a state change occurs; and Whenever data is received from the Origin of Data by the UWSS	In accordance with Origin of Data	Mandatory
Launch time, launch mode, direction, search depth of all Lightweight Torpedoes launched by ownship, aircraft, and consort		Combat Management System 330	In accordance with Origin of Data	In accordance with Origin of Data	Whenever data is received from the Origin of Data by the UWSS	In accordance with Origin of Data	Mandatory

Contact entities as a minimum: 1) all surface contacts; 2) all aircraft contacts: 3) all ownship sonar contacts; 4) all task group sonar contacts; 5) all LINK (Link 11, 16, and 22) sonar contacts; 6) all sonar contacts from other sources; 7) all submarine Electronic Support Measures (ESM); and 8) all submarine Communications Electronic Support Measure (CESM) contacts. All of the above must include associated location data (bearing line, area of probability (AOP), range and bearing) and associated tracking data		UWSS, Navigation Data Distribution System and Combat Management System 330	In accordance with Origin of Data	In accordance with Origin of Data	Whenever data is received from the Origin of Data by the UWSS	In accordance with Origin of Data	Mandatory
All Underwater Warfare (UWW)-related alert and alarm messages, including threat warning levels		UWSS and Combat Management System 330	In accordance with Origin of Data	In accordance with Origin of Data	Whenever data is received from the Origin of Data by the UWSS	In accordance with Origin of Data	Desirable
All UWW-related overlays		Combat Management System 330	In accordance with Origin of Data	In accordance with Origin of Data	Whenever data is received from the Origin of Data by the UWSS	In accordance with Origin of Data	Mandatory
All UWW-related LINK 11, 16, and 22 messages		Combat Management System 330	In accordance with Origin of Data	In accordance with Origin of Data	Whenever data is received from the Origin of Data by the UWSS	In accordance with Origin of Data	Mandatory

Track management control messages		UWSS and Combat Management System 330	In accordance with Origin of Data	In accordance with Origin of Data	Whenever data is received from the Origin of Data by the UWSS	In accordance with Origin of Data	Desirable
System control and status information (e.g. time synchronization)		UWSS and Combat Management System 330	In accordance with Origin of Data	In accordance with Origin of Data	Whenever data is received from the Origin of Data by the UWSS	In accordance with Origin of Data	Mandatory
Automatic Identification System (AIS) data		Navigation Data Distribution System	In accordance with Origin of Data	In accordance with Navigation Data Distribution System	Once per 10 seconds or more frequent	In accordance with Origin of Data	Mandatory
Sonar data from other sonar sources	Sonar data for multi-static operations	Passed from Combat Management System 330, and as received from other sources	In accordance with Origin of Data	In accordance with Origin of Data	Whenever data is received from the Origin of Data by the UWSS	In accordance with Origin of Data	Mandatory
Target specifications	Target strength and noise emission levels	National Acoustic Library (NAL) database (full access)	In accordance with Origin of Data	In accordance with Origin of Data	Whenever (i) NAL database is loaded into the UWSS. Data collected must have name, version, and date of the database; and (ii) NAL tactical database is accessed by UWSS	In accordance with Origin of Data	Mandatory

Record of tactical database access by UWSS (semi-auto and manual queries)	Identification of targets that UWSU System exploits based on whatever NAL inputs or database has been imported into UWSU System	National Acoustic Library (NAL) database (full access)	In accordance with Origin of Data	In accordance with Origin of Data	Whenever (i) NAL database is loaded into the UWSS. Data collected must have name, version, and date of the database; and (ii) NAL tactical database is accessed by UWSS	In accordance with Origin of Data	Mandatory

Communications Data Table

Name	Description	Origin of Data	Data type	Precision	Sampling and Recording Period	Data size	Requirement Type
COMMUNICATIONS							
Record all operator-operator-analyst communications (chat, email and voice)		Operator Human Machine Interface (HMI)	Text and Digital Audio	In accordance with Origin of Data	In accordance with Origin of Data	In accordance with Origin of Data	Mandatory
Record UWSS network operations	Bandwidth analysis, CPU activity and other UWSU network performance metrics	UWSS	In accordance with Origin of Data	In accordance with Origin of Data	In accordance with Origin of Data	In accordance with Origin of Data	Mandatory
Record all reach back communications interfaced with UWSS	files, emails and voice	National network (e.g. P3S)	Text and Digital Audio	In accordance with Origin of Data	In accordance with Origin of Data	In accordance with Origin of Data	Desirable

Marine Systems Data Table

Name	Description	Origin of Data	Data type	Precision	Sampling and Recording Period	Data size	Requirement Type
MARINE SYSTEMS ENGINEERING							
Machinery control data	Machinery states, rudder, shafts, gearing, main propulsion, and auxiliaries states	Integrated Platform Management System (IPMS)	In accordance with Origin of Data	In accordance with Origin of Data	In accordance with Origin of Data	In accordance with Origin of Data	Mandatory
Sensor self-noise	decibel (dB)	UWSS sensor	Binary	In accordance with Origin of Data	In accordance with Origin of Data	In accordance with Origin of Data	Mandatory
Calculate end-to-end system processing gain	decibel (dB)	UWSS	Binary	Maximum achievable with uncertainty estimate	Whenever sensor is deployed	In accordance with Origin of Data	Mandatory

Operator and HMI Data Table

Name	Description	Origin of Data	Data type	Precision	Sampling and Recording Period	Data size	Requirement Type
OPERATOR AND HMI							
Operator logs and markers	Operator sensor manipulations, and event marker insertion	Operator Human Machine Interface (HMI)	In accordance with Origin of Data	Not applicable	In accordance with Origin of Data	In accordance with Origin of Data	Mandatory
Analyst annotations and markers	Analysis interpretations (text via keyboard and event marker insertion)	Analyst HMI	In accordance with Origin of Data	Not applicable	In accordance with Origin of Data	In accordance with Origin of Data	Mandatory
Operator console display video capture	Console Video Capture	All UWSS Operator Displays	Digital video jpeg2000 or zygo coder-decoder (CODEC) format	In accordance with Origin of Data	National Television System Committee (NTSC) 29.9 frames per second (fps)	Saved to a compressed file structure	Mandatory
Operator screen capture images	Console Video Screen Capture. Capable of merging with the separate audio track recording. Saved with UTC time stamp of capture and originating source (workstation)	All UWSS Operator Displays	Digital image jpeg format	In accordance with Origin of Data	Operator initiated and with variable periodicity feature (e.g. 1 image per minute).	In accordance with Origin of Data	Mandatory
Operator training session data for Operator procedures, HMI familiarization, and basic acoustic skill development.	Training scenario, actions & results for Operator procedures, Human Machine Interface (HMI) familiarization, or basic acoustic skill development	UWSS (training mode)	In accordance with Origin of Data	Not applicable	In accordance with Origin of Data	In accordance with Origin of Data	Mandatory
Operator training session data for mission rehearsal training	Training scenario, actions & results for mission rehearsal training	UWSS (training mode)	In accordance with Origin of Data	Not applicable	In accordance with Origin of Data	In accordance with Origin of Data	Mandatory

Operator and Analyst audio capture	For each operator position. Continuous Audio recording, saved as a separate timestamped audio track.	Operator and Analyst HMI	Digital Audio	16 bit stereo (if split headset configuration)	48 kHz or greater sampling rate	.wav or similar industry lossless audio format	Mandatory
Operational, oceanographic and meteorological briefs	Section, Ship, Task Group, Headquarters (HQ) level briefings from: - Ship Local Area Network (SHIPLAN); - Consolidated Secret Network Infrastructure (CSNI); - other networks; and - briefs developed inside UWSU System. Various file types (.ppt, ACP 117 messages, emails, and other formats) imported into or developed inside UWSS	Operator, ship, task group, and HQ brief originators	In accordance with Origin of Data	Not applicable	In accordance with Origin of Data	In accordance with Origin of Data	Desirable

Sensor Control Data Table

Name	Description	Origin of Data	Data type	Precision	Sampling and Recording Period	Data size	Requirement Type
SENSOR CONTROL, PROCESSING, AND OUTPUT							
Target location	Tracks, dead reckoning tracks, bearing to sensor, area of probability (AOP), range and bearing, and latitude-longitude	UWSS	Binary	Same or greater precision than what is provided in accordance with Combat Management System 330 Target Motion Analysis Module	1 second or more frequent	In accordance with Origin of Data	Mandatory
Bearing error (accuracy parameters based on beam forming shapes and etc.) tactically expressed in the construction of a target AOP	degrees	UWSS	Binary	Same or greater precision than what is provided in accordance with Combat Management System 330 Target Motion Analysis Module	Whenever there is a state change; and Whenever data is received from the Origin of Data by the UWSS	In accordance with Origin of Data	Mandatory
Range error (design estimation based on sensor and waveform in use) tactically expressed in the construction of a target AOP	metres (m)	UWSS	Binary	Same or greater precision than what is provided in accordance with Combat Management System 330 Target Motion Analysis Module	Whenever there is a state change; and Whenever data is received from the Origin of Data by the UWSS	In accordance with Origin of Data	Mandatory

Tracking data (course and speed)	degrees, knots	UWSS	Binary	Same or greater precision than what is provided in accordance with Combat Management System 330 Target Motion Analysis Module	1 second or more frequent	In accordance with Origin of Data	Mandatory
Record of automated detections, classifications and tracking data		UWSS	In accordance with Origin of Data	In accordance with Origin of Data	1 second or more frequent	In accordance with Origin of Data	Mandatory
Record sensor control commands		UWSS	Text	Not applicable	Whenever there is a state change; and Whenever sensor controls messages (commands, response, data) are received from Origin of Data by UWSS	In accordance with Origin of Data	Mandatory
Record multistatic coordination and control commands and data		UWSS	Binary	In accordance with Origin of Data	Whenever there is a state change; and Whenever coordination and controls messages (command, response, data) are received from Origin of Data by UWSS	In accordance with Origin of Data	Mandatory

Record multistatic data processing of ownship and task group active sonar data		UWSS	Binary	In accordance with Origin of Data	For ownship, 1 second or more frequent; and From task group entities, in accordance with Origin of Data	In accordance with Origin of Data	Mandatory
Record automated transmitter control following marine mammal mitigation procedures		UWSS	Binary	Not applicable	Whenever there is a state change; and Whenever data is received from the Origin of Data by the UWSS	In accordance with Origin of Data	Desirable
Record sonar mode information		UWSS	Binary	Not applicable	Whenever there is a state change; and Whenever data is received from the Origin of Data by the UWSS	In accordance with Origin of Data	Mandatory
Record passive acoustic configuration control		UWSS	Binary	Not applicable	Whenever there is a state change; and Whenever data is received from the Origin of Data by the UWSS	In accordance with Origin of Data	Mandatory
Record configuration and input parameters of embedded tactical aids		UWSS	Binary	In accordance with Origin of Data	Whenever there is a state change; and Whenever data is received from the Origin of Data by the UWSS	In accordance with Origin of Data	Mandatory

Record results of the Built-In Test and Emulator (BITE) capability		UWSS	Binary	Not applicable	Whenever test results occur; and Whenever data is received from the Origin of Data by the UWSS	In accordance with Origin of Data	Mandatory
Record all warnings and alarms		UWSS	Binary	Not applicable	Whenever there is a state change; and Whenever data is received from the Origin of Data by the UWSS	In accordance with Origin of Data	Mandatory
Record sensor system status		UWSS	Binary	Not applicable	Whenever there is a state change; and Whenever data is received from the Origin of Data by the UWSS	In accordance with Origin of Data	Mandatory
Record sensor system settings		UWSS	Binary	In accordance with Origin of Data	Whenever there is a state change; and Whenever data is received from the Origin of Data by the UWSS	In accordance with Origin of Data	Mandatory
Record all associated sensor metadata		UWSS	Binary	Not applicable	Whenever there is a state change; and Whenever data is received from the Origin of Data by the UWSS	In accordance with Origin of Data	Mandatory

Transmit ping schedule (ownship and other participating unit)	Active transmit schedule including: pulse type, pulse length, frequency and bandwidth	UWSS	Binary	In accordance with Origin of Data	Whenever there is a state change; and Whenever data is received from the Origin of Data by the UWSS	In accordance with Origin of Data	Mandatory
Record HMS and echo sounder trigger status		UWSS	Binary	Not applicable	Whenever there is a state change; and Whenever data is received from the Origin of Data by the UWSS	In accordance with Origin of Data	Mandatory
Record time of active transmissions		UWSS	Binary	In accordance with Origin of Data	Whenever data is received from the Origin of Data by the UWSS	In accordance with Origin of Data	Mandatory
Record transmission pulse frequency, waveform type, length and power level		UWSS	Binary	In accordance with Origin of Data	Whenever data is received from the Origin of Data by the UWSS	In accordance with Origin of Data	Mandatory
Record inter-pulse period and maximum sampling and processing range		UWSS	Binary	In accordance with Origin of Data	Whenever data is received from the Origin of Data by the UWSS	In accordance with Origin of Data	Mandatory
Record directional transmission characteristics		UWSS	Binary	In accordance with Origin of Data	Whenever data is received from the Origin of Data by the UWSS	In accordance with Origin of Data	Mandatory

Record raw receive sensor data	Raw active and passive received signals (including HMS, tow and sonobuoys)	UWSS	In accordance with Origin of Data	In accordance with Origin of Data	Whenever data is received from the Origin of Data by the UWSS	In accordance with Origin of Data	Mandatory
Record processed receive sensor data	Processed active and passive received signals (including HMS, tow and sonobuoys)	UWSS	In accordance with Origin of Data	In accordance with Origin of Data	Whenever data is received from the Origin of Data by the UWSS	In accordance with Origin of Data	Mandatory
Record all associated sensor metadata and operator annotations		UWSS	In accordance with Origin of Data	In accordance with Origin of Data	Whenever data is received from the Origin of Data by the UWSS	In accordance with Origin of Data	Mandatory

Sonar Hardware Data Table

Name	Description	Origin of Data	Data type	Precision	Sampling and Recording Period	Data size	Requirement Type
SONAR HARDWARE							
Tow (s) - Released Cable Length	metres (m)	UWSS Sensor Handling System	Binary	In accordance with Origin of Data	1 second or more frequent	In accordance with Origin of Data	Mandatory
Tow - All Sensor Array headings	degrees true	UWSS	Binary	In accordance with Origin of Data	1 second or more frequent	In accordance with Origin of Data	Mandatory
Tow - All Sensor Array pitch and roll	degrees/second	UWSS	Binary	In accordance with Origin of Data	1 second or more frequent	In accordance with Origin of Data	Mandatory
Tow - All Sensor Array depths	metres (m)	UWSS	Binary	In accordance with Origin of Data	1 second or more frequent	In accordance with Origin of Data	Mandatory
Tow - All Sensor Array layback	metres (m)	UWSS	Binary	In accordance with Origin of Data	1 second or more frequent	In accordance with Origin of Data	Mandatory
Tow - All Sensor Array Curvature	degrees	UWSS	Binary	In accordance with Origin of Data	1 second or more frequent	In accordance with Origin of Data	Mandatory
Array Settings: Heading, Temperature, Depth (Heading, Depth and Temperature Module (HDTM) info)		UWSS Sensor	Binary	In accordance with Origin of Data	Whenever data is received from the Origin of Data by the UWSS	In accordance with Origin of Data	Mandatory