

Volume 2, Annex C, Appendix 1

System Requirements Document
Data Collection Requirements

Underwater Warfare Suite Upgrade

10 February 2017

ID		Requirement Type
DCR-383	Volume 2, Annex C, Appendix 1 to W8472-135462 System Requirements Document - Data Collection Requirements Dated: 10 February 2017	Heading
DCR-384	Volume 2, Annex C, Appendix 1 System Requirements Document Data Collection Requirements Underwater Warfare Suite Upgrade 10 February 2017	Heading
DCR-342	1 Data Collection Requirements	Heading
DCR-2	1.1 Data Collection General Requirements	Heading
DCR-5	1.1.1 The Data Recording, Replay and Management System (DRRMS) must collect data automatically.	Mandatory
DCR-6	1.1.2 The DRRMS must collect:	Mandatory
DCR-377	(a) Raw acoustic data that is collected from the USCs;	Mandatory
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
DCR-378	(c) Raw video from workstation displays.	Mandatory
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
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
DCR-199	1.1.5 The DRRMS collected data must include all data required to unambiguously recreate the series of recorded data.	Mandatory
DCR-9	1.1.6 The DRRMS must store no less than 36 hours of immediately accessible data in random access storage.	Mandatory
DCR-10	1.1.7 The DRRMS must provide access to the immediately preceding 36 hours of collected data.	Mandatory

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DCR-11	1.1.8 The DRRMS must store collected data on removable storage media.	Mandatory
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
DCR-14	1.1.10 The DRRMS removable storage media must be easily accessible by operators.	Mandatory
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
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
DCR-17	1.1.13 The DRRMS must meet its performance requirements while operating simultaneously with the UDMS non-DRRMS functions.	Mandatory
DCR-18	1.1.14 The DRRMS must have a means for personnel to remove the recorded data.	Mandatory
DCR-380	1.1.15 The DRRMS must have a means to export selected recorded data.	Mandatory
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
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
DCR-21	1.2 Data Collection Configuration	Heading
DCR-22	1.2.1 The UDMS must control the configuration of the DRRMS.	Mandatory
DCR-23	1.2.2 The UDMS must manage the DRRMS configuration parameters as entered by the user.	Mandatory
DCR-24	1.3 Data Collection Alarms	Heading
DCR-25	1.3.1 The UDMS must send an alert to the user when the removable storage media usage exceeds a	Mandatory

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	predefined threshold specified by the user.	
DCR-26	1.3.2 The UDMS must send an alarm to the user when the removable storage media usage reaches full capacity.	Mandatory
DCR-32	1.4 Data Collection Video Requirements	Heading
DCR-34	1.4.1 The DRRMS must accept input video sources from all UWSS Operator consoles.	Mandatory
DCR-35	1.4.2 The DRRMS must record console video sources simultaneously, as selected by the operator.	Mandatory
DCR-201	1.5 Data Collection Captured Screen Image Requirements	Heading
DCR-202	1.5.1 The DRRMS must allow the operators to capture screen images from all UWSS Operator consoles.	Mandatory
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
DCR-204	1.5.3 The DRRMS must record the annotated captured screen images, as selected by the operator.	Mandatory
DCR-36	1.6 Data Collection Raw Acoustic Data Requirements	Heading
DCR-37	1.6.1 The DRRMS must accept input from acoustic sources from all USCs.	Mandatory
DCR-38	1.7 Data Collection File Management Requirements	Heading
DCR-39	1.7.1 The DRRMS must allow the user to manage recorded data through user created files.	Mandatory
DCR-40	1.7.2 The DRRMS must allow the user to manage exported processed data through user created files.	Mandatory
DCR-42	1.8 Data Collection Playback Requirements	Heading
DCR-43	1.8.1 The DRRMS must provide onboard playback of recorded acoustic and non-acoustic sources.	Mandatory
DCR-44	1.8.2 The DRRMS must provide onboard playback of recorded video sources.	Mandatory
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
DCR-205	1.8.4 The DRRMS must display captured screen images.	Mandatory
DCR-46	1.8.5 The DRRMS must display non-acoustic recorded data in decoded format.	Mandatory

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DCR-47	1.8.6 The DRRMS must provide onboard playback of recorded raw acoustic data on USCs.	Mandatory
DCR-48	1.8.7 The UDMS must playback and reprocess recorded raw acoustic data simultaneously while the UWSS is in Operational mode.	Mandatory
DCR-168	1.9 Data Collection Data Requirements	Heading
DCR-174	1.9.1 The DRRMS must record all data specified in the Kinematics Data Table.	Mandatory
DCR-176	1.9.2 The DRRMS must record all data specified in the Environmental Data Table.	Mandatory
DCR-182	1.9.3 The DRRMS must record all data specified in the Tactical Data Table.	Mandatory
DCR-177	1.9.4 The DRRMS must record all data specified in the Communications Data Table.	Mandatory
DCR-178	1.9.5 The DRRMS must record all data specified in the Marine Systems Data Table.	Mandatory
DCR-179	1.9.6 The DRRMS must record all data specified in the Operator and HMI Data Table.	Mandatory
DCR-180	1.9.7 The DRRMS must record all data specified in the Sensor Control Data Table.	Mandatory
DCR-181	1.9.8 The DRRMS must record all data specified in the Sonar Hardware Data Table.	Mandatory
DCR-349	1.10 External Interface to Post-Mission Analysis Systems	Heading
DCR-350	1.10.1 Introduction	Heading
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
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 Innovations (RTI) Data Distribution Service (DDS) Interface Definition Language (IDL) and Google Protocol Buffer proto files.	Information
DCR-358	1.10.1.3 C++ header files or Google Protocol Buffer proto files format are the preferred formats.	Information
DCR-353	1.10.1.4 Since CFMWC will be using InterMAP to	Information

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	parse the DRRMS data files, CFMWC will require an offboard software parser source code or dynamic link libraries.	
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
DCR-355	1.10.2 Data Collection External Interface Requirements	Heading
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
DCR-362	(a) C++ header files;	Mandatory
DCR-363	(b) Google Protocol Buffer proto files;	Mandatory
DCR-364	(c) RTI DDS IDL files; or	Mandatory
DCR-365	(d) XML data structures, including all XML Schema Definition (XSD) files and all extra content required to interpret the XML.	Mandatory
DCR-359	1.10.3 Data Collection Standalone Parser Requirements	Heading
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
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 computer.	Mandatory

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

<p>Sound velocity profile (2) The three Sound Velocity Profile collection methods are required.</p>	<p>Sound velocity profile and temperature profile</p>	<p>Bathythermograph sonobuoy</p>	<p>In accordance with SSQ-536 Bathythermograph Sonobuoy (and variants)</p>	<p>In accordance with processed outputs of SSQ-536 Bathythermograph Sonobuoy (and variants)</p>	<p>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).</p>	<p>In accordance with SSQ-536 Bathythermograph Sonobuoy (and variants)</p>	<p>Mandatory</p>
<p>Sound velocity profile (3) The three Sound Velocity Profile collection methods are required.</p>	<p>Sound velocity profile and temperature profile</p>	<p>Import files on digital media in accordance to Section 3.9.12 Acoustic Range Prediction of the SRD</p>	<p>In accordance with Origin of Data</p>	<p>In accordance with Origin of Data</p>	<p>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</p>	<p>In accordance with Origin of Data</p>	<p>Mandatory</p>

					earlier); and (iii) name, version, and date of the database.		
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
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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
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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
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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

					System		
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
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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
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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

<p>Launch time, launch mode, direction, search depth of all Lightweight Torpedoes launched by ownship, aircraft, and consort</p>		<p>Combat Management System 330</p>	<p>In accordance with Origin of Data</p>	<p>In accordance with Origin of Data</p>	<p>Whenever data is received from the Origin of Data by the UWSS</p>	<p>In accordance with Origin of Data</p>	<p>Mandatory</p>
<p>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.</p> <p>All of the above must include associated location data (bearing line, area of probability (AOP), range and bearing) and associated tracking data</p>		<p>UWSS, Navigation Data Distribution System and Combat Management System 330</p>	<p>In accordance with Origin of Data</p>	<p>In accordance with Origin of Data</p>	<p>Whenever data is received from the Origin of Data by the UWSS</p>	<p>In accordance with Origin of Data</p>	<p>Mandatory</p>

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	In accordance with Origin of Data	Mandatory

					UWSS		
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
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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	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	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

	or developed inside UWSS						
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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	Whenever there is a state change; and Whenever data is received from the Origin of Data by the	In accordance with Origin of Data	Mandatory

				Analysis Module	UWSS		
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	In accordance with Origin of Data	Mandatory

					Data by the UWSS		
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 (ownership 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	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

	sonobuoys)						
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