DRAFT APPENDIX A1
TO ANNEX A

LAND C4ISR SUSTAINMENT CONTRACT

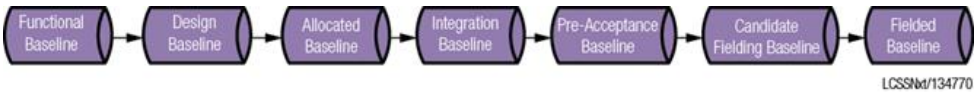
GLOSSARY AND ABBREVIATIONS

Table of Contents

1 Introduction

This document provides a glossary of terms and a list of all abbreviations used in the SOW and its associated Appendices.

2 Glossary

Term	Definition
Actor	Persons, systems and devices that interact with the Land C4ISR Capability. The following information comprises the details of an actor: Role/Title; what they do; what information they require; what information products they create; what they need the Land C4ISR Capability to provide and what parts of the system they interact with.
Applications Functional Grouping	This functional grouping is based on all user facing services and software which leverage the MD and HQ Domains to provide capability to the end user. Information generated by services and software in this functional grouping is then transported by the Land C4ISR Core Network Functional Grouping from its origin to destination. This functional grouping is information based and comprised largely of software and databases, with no involvement in hardware or firmware development.
Adaptive Maintenance	As it applies to software: The modification of a software product, performed after delivery, to keep a software product usable in a changed or changing environment (ISO/IEEE 14764). Definition applies to system as well.
Baseline	A baseline describes the list of products (requirements, hardware, software and firmware) that collectively form the System or System of Systems. There are many forms of the baseline that can exist as they represent a particular viewpoint of the Land C4ISR Capability. The following chart represents the flow of an engineering baseline from its initial definition to becoming a Fielded Baseline. Not all baselines will become Fielded Baselines.  - Functional Baseline. This is the first requirements baseline. It is the list of high level requirements or capabilities that the baseline must achieve to satisfy a particular set of user needs. The output of this baseline is usually captured via a requirements roadmap to drive the development of the baseline cycle.

- Design Baseline. This is the second of the requirements baseline, where the high level functional baseline is de-composed into the Change Requests (CRs) and System Problem Reports (SPRs) or bugs that will be included into this baseline. The output of this baseline is also normally captured via a roadmap.

- Allocated Baseline. This is the last of the requirements baseline, as it describes the work that will be completed by all development and engineering teams during a particular work interval. The input to this baseline is a sub-set of the Design baseline CRs and SPRs. The output of this baseline is the first full list of all products, sub-systems and systems that comprise the Land C4ISR Capability Baseline. This includes all hardware, software and firmware that comprise the baseline, along with their versions and media numbers. This baseline is sometimes referred to as the Engineering Baseline, or the baseline that is currently undergoing development. Once the Allocated Baseline is completed, the final list of products and sub-systems becomes the base of the Integration Baseline.

- Integration Baseline. The integration baseline (or sometimes referred to as the Baseline under test) is the list of all hardware, software and firmware included in a particular continuous integration test at the sub-system, system or SoS level. It should have two components; the full list for the baseline and the sub-set that will be undergoing testing in any given test cycle. This list is continually updated until it is ready for formal verification and validation testing.

- Pre-Acceptance Baseline. This is the baseline that is identified to start the formal verification and validation cycle. It should contain the list of hardware, software, firmware, documentation and System Management procedures for the System or SoS under test. This baseline can no longer be modified once it is defined for the duration of the testing cycle. Depending on the results of the test, the baseline can be modified for critical bug fixes before proceeding to the Candidate Fielding Baseline. This baseline can also be referred to as the Engineering Baseline as some are not approved to proceed to the Candidate Fielding Baseline.

- Candidate Fielding Baseline. This baseline is the result of a successful verification and validation of the Pre-Acceptance Baseline. It is similar in composition to Pre-Acceptance Baseline, however is the finalized list that will be presented to the Canadian Army for acceptance. It is normally the result of a Functional or Performance Confirmation Audit (FCA/PCA).

- Fielded Baseline. This is also defined as the “In-Service” Baseline and represents the current configuration of the Land C4ISR Capabilty that is currently employed by the Canadian Army.

Command and Control	Command and Control (C2), as defined by NATO, is the exercise of authority and direction by a designated commander over assigned forces in the accomplishment of the force's mission.
Command, Control, Communication, Computers, Intelligence, Surveillance, Reconnaissance	Command, Control, Communication, Computers, Intelligence, Surveillance and Reconnaissance (C4ISR) is a concept that integrates command, communication and intelligence activities to enhance decision making.
Continuous Integration / Continuous Delivery	Continuous Integration (CI) is a (modern) software development practice in which incremental code changes are made frequently and reliably. Automated build-and-test steps triggered by CI ensure that code changes being merged into the repository are reliable. The code is then delivered quickly and seamlessly as a part of the Continuous Delivery (CD) process.
Core Network Functional Grouping	This functional grouping is based on all services that are common across all of the domains, and forms the backbone or backend of the overall Land C4ISR Capability. Engineering activities under this functional grouping revolve around utilizing the standards and connecting patterns developed in the Land C4ISR Functional Groupings and applying them to the sub-system and product design of the Land C4ISR Core Network. It is comprised of hardware, firmware, software and some databases. The meaning of the term core in the context of the 'Land C4ISR Core Network' is distinct from the meaning of core as defined elsewhere in the context of 'Core Work' and subcategories of Core Work.
Data Management	Data Management (DM) is the administration of documents or data related to engineering applications using computers and electronic storage media.
Emergency Maintenance	An unscheduled modification performed to temporarily keep a system operational pending corrective maintenance (ISO/IEEE 14764).
Enabling System	A system that compliments a system-of-interest during its life-cycle stages but does not necessarily contribute directly to its function during operation (ISO/IEC 15288)
Field Service or Support Representative	Field Support Representative (FSR) is the Contractor's representative that is embedded into the Canadian Army Divisions (geographically located). Their role is to understand the Land C4ISR Capability under development or next to be fielded and assist in its deployment to the Canadian Army. This is through assistance to Army delivered training, or acting as a subject matter expert on the

	configuration and operation of the system that Canadian Army users can call upon for assistance.
Field Trial	An engineering focused test event in an operational setting, often with equipment operated by Canadian Armed Forces (CAF) personnel with test direction by DND or TA.
Field Trial Support Service	This service comprises of dedicated test resources that are capable of conducting or participating in field trials. These resources need to be able to travel to any Canadian Forces Base or training area in Canada and potentially abroad. This team can be a mix of testers, developers, engineers and operational specialists depending on the assigned tasks.
Full Support	Full Support defines the responsibly for a product under a specific Functional Grouping, the Crown or the Original Equipment Manufacturer of a particular product (i.e. Microsoft). When an organization is identified to have full support of a product they are responsible for, but not limited to: a. Product design; b. Product development; c. Product verification; d. Engineering and user documentation at the product level; e. Product level training material (or in some cases input to sub-system or system level training material); f. Product obsolescence management; g. Product configuration management; h. Root cause diagnosis and repair of identified faults; i. Repair and overhaul; and j. Product system management and input to higher level system management processes and activities.
Government Furnished Assets	Government Furnished Assets (GFA) consist of Government Furnished Equipment (GFE), Government Furnished Information (GFI), Government Supply Material (GSM), and Government Furnished Vehicles (GFV).
Government Furnished Equipment	Government Furnished Equipment (GFE) is equipment provided by the Government for use in carrying out the work of the contract. It includes both commercial hardware and military operations hardware.
Government Furnished Information	Government Furnished Information (GFI) is information provided by the Government in carrying out the work of the contract. It includes: a. Media (CD, DVD, DVD DL, memory stick, dongle, etc); b. Technical documentation and data;

	c. Commercial Off-The-Shelf (COTS) software and licenses; and d. Military Off-The-Shelf (MOTS) software and licenses.
Government Supplied Material	Government Supplied Material (GSM) is material supplied by the Government for incorporation into the end product.
Government Furnished Vehicles	Government Furnished Vehicles (GFV) are vehicles supplied by the Government for use in carrying out the work of the contract.
Headquarters Domain	The Headquarters (HQ) Domain is normally employed at the brigade in the command elements of these units and formations. It is characterized by high and rich data requirements. Fundamentally it operates like a field deployable enterprise network, running a variety of client-server applications and data bases. It also is the domain that links to National or Coalition systems. It can be described as transportable, but not mobile; meaning network laydown and configuration is relatively stable. It also operates at the SECRET level, with increased security protection due to the volume of data utilized on this network.
Incident	The Information Technology Information Library (ITIL) defines an incident as an unplanned interruption to or quality reduction of an IT service. It differs from an SPR in that its goal is to return service to normal working levels, where an SPR aims to determine the root cause of a problem. Several incidents maybe combined to form an SPR. These are solely raised against the in-service or fielded baseline and are generally originated by the Canadian Army (user community).
Integration	Integration is the process of deliberate assembly of the components of sub-system, system or SoS into a functioning whole. In the Land C4ISR Capability, it is the combination of products into sub-systems, the combination of those sub-systems into systems, and the combination of those systems into the Land C4ISR Capability. Integration is also used to determine the scope of one of the Land C4ISR Capability functional groupings. It identifies which functional grouping is responsible for the combination of specific products into specific sub-systems, which in turn are combined into the Land C4ISR Capability.
Integrated Logistics Support	Integrated Logistics Support (ILS) is a process where supportability, sustainment, maintenance, training and documentation are integrated into the system engineering and design process to lower the life-cycle cost of a product or system. It is critical process, without which, the Canadian Army would not be able to train, deploy and utilize the Land C4ISR Capability.
Integrated Product Team	An Integrated Product Team (IPT) is a multidisciplinary group of people who are collectively responsible for delivering a defined product or process. IPTs are used in complex development programs/projects for review and decision making. The

	emphasis of the IPT is on involvement of all stakeholders (users, customers, management, developers and contractors) in a collaborative forum.
Intelligence, Surveillance and Reconnaissance	Intelligence, Surveillance and Reconnaissance (ISR) are the sensors and analysis used to gather tactical information. This functional grouping remains similar to the existing support concept, comprising of standalone system, integrated sub-system and products for specialized ISR services. When integrated into the MD and HQ Domains, the sub-systems and products pass information over the Land C4ISR Core Network Functional Grouping and interact with the Land C4ISR Applications Functional Grouping.
Intelligence, Surveillance, Target Acquisition and Reconnaissance	Intelligence, Surveillance, Target Acquisition and Reconnaissance (ISTAR) a grouping of information collection, processing, dissemination and communication assets designed, structured, linked and disciplined to provide situational awareness (SA), support targeting and support to commanders in decision making.
In-Service Support	In-Service Support (ISS) provides operational value to defence in terms of availability and reliability of the equipment upon missions and training, and of an extension of its useful life and comprises a full array of coordinated services that address the lifecycle of weapon systems. This approach offers a single point of accountability at all points during the service life of a product. As a result, mission effectiveness and readiness are improved while the total cost of ownership is reduced.
Land Command Support System	The Land Command Support System (LCSS) is the SoS that primarily supports Canadian Army operations by providing commanders with the information and information services required to make effective and timely Command and Control (C2) decisions about their forces. As such, it enables the Canadian Army to: a. Plan and direct operations; b. Manage operational information; c. Achieve situational awareness; and d. Exchange information. LCSS is an interconnected network of digital communications and information Systems by which the data needed to plan, direct and control tactical land operations is communicated, stored, processed and displayed.
Land C4ISR Capability	The Land C4ISR Capability the result of the integration of LCSS with its associated ILS. It is considered a full capability when the Canadian Army can train, plan, configure, operate, manage and maintain the LCSS System in a given operating environment.

Capability	The combination of a System or a System of Systems augmented with its ILS. A Capability achieves a desired effect in a specific operating environment.
System of Systems	The combination of Systems that have been integrated.
System	The combination of Sub-Systems that, when integrated together, meet the stakeholders needs. A System functions independently.
Sub-System	The combination of Products that when integrated together, meet the stakeholders requirements. Sub-Systems do not function independently, but are dependent on each other to form a System.
Product	A product is a piece of hardware, software, firmware, database or configuration file that is part of Land C4ISR Capability. Each product performs a specific function within the Land C4ISR Capability, but does not constitute a capability unto itself. Products are grouped together logically or by the function they perform and integrated into Sub-Systems.
Mobile Domain	The MD is normally employed in mounted (vehicle based) environment from platoon to the Battle Group (BG) level. Generally, it is characterized by a mobile ad-hoc network (MANET), with a medium data requirement operating at the SECRET security classification. The primary means of communication remains voice. The supporting data network is highly mobile and is based on the idea of digitizing a soldier's paper map. It is not client-server based and there is no expectation of guaranteed delivery of messages.
Operational Specialist	Persons that qualify as operational specialists must have prior military experience that can be translated into a Contractor's program. These specialists function as pseudo-users for the engineers and developers to ask questions and SEEK opinions on how a user would interact with the system. Their role is to attempt to resolve usability and trainability issues during development and testing.
Parent platform/vehicle configuration	These are platforms and vehicles that are modified by the Contractor with the installation and modification kits for the system release of interest. These become pre-production models used for field engineering and validation exercises in order to verify the modifications, generate the modification instructions, and develop the bill of materials for production/modification of the Canadian Army vehicle fleets.
Perfective Maintenance	The modification of a software product after the delivery to detect and correct latent faults in the software product before they are manifested as failures. Note perfective maintenance provides enhancements for users, improvement of program documentation, and recoding to improve performance, maintainability, or other attributes. (ISO/IEC/IEEE 14764:2006)

Personas	They are archetypical descriptions that outline the main characteristic of the user population and sub-populations. Describes in more detail the specifics related to a role and Actor in the system. Provides a level of understanding of who the end user in a meaningful fashion that focuses on that groups archetype, there tasks, goals, frustrations and pain points. Allowing the engineering community to understand better who the end design is over and above the term 'User' and the generic 'Actor' of the system. An Actor can typically have multiple Personas describing that Actor.
Record of Decisions (ROD)	The formal minutes of a meeting where decisions are recorded.
Statement of Capability Deficiency	The Statement of Capability Deficiency (SOCD) is a document that may be produced by any level of organization within the Canadian Army (CA) to identify an existing or future deficiency in the capabilities of the Canadian Army. The SOCD is, at the very least, the identification of a modification request (MR). Ultimately, if supported by the chain of command and considering other competing project priorities and fiscal constraints, the SOCD may be the genesis of a Defence Services Program to rectify the documented deficiency
System Element	A member of a set of elements what constitutes a system (ISO/IEC 15288)
System Health Index	System Health Index (SHI) is an evaluation of the characteristic of a Land C4ISR Capability by measuring target items on physical or judgemental metrics. Table below shows a classification of target items used in the determination of SHI. This list of target items can be adapted.

Target Items Used in System Health Index

Adequacy	Reserve	Network Bandwidth
		Processing
		Memory
		Storage
	Overload	Communication
		Server Site
		End User
Security	Confidentiality	Communication
		Information
		Insider Threat
	Integrity	System Monitoring (Event, Incident and Problem Management)
		End Point Protection / Intrusion Detection/Prevention System
		Disaster Recovery
	Availability	Reliable Power
		Failover/Failback
		Redundancy (Primary, Alternate, Contingency, Emergency)

System of Systems	This functional grouping is based on systems and services that satisfy the defined user need. The primary role of this functional grouping is to integrate Core

Engineering and Integration Functional Grouping	Network, Applications and ISTAR functional groupings into a fully functioning System and System of Systems. This functional grouping is over all responsible for Human Factors Engineering, Architecture and Systems of Systems Engineering for the Land C4ISR Capability. It is also responsible for System Engineering for the Soldier, Mobile and Headquarters Domains. It is not comprised of products and sub-systems like the other functional groupings with the main deliverables from this functional grouping are user needs, requirements, and communication and interface standards. It is overall responsible to integrate and delivery the Land C4ISR Capability to the Canadian Army.
System Problem Report	A System Problem Report (SPR) is generated when an issue is found with a product, sub-system or system within the Land C4ISR Capability and aims to determine and rectify the root cause of a problem. SPRs can be raised by anyone, and are normally raised in the development, integration and verification stages of the engineering process. SPRs in the Fielded Baseline are generally originate from incidents. SPRs are recorded in a DLCSPM provided database for tracking and resolution.
Tactical Command, Control and Information System	Tactical Command, Control and Information System (TacC2IS) employs an integrated network of computers with specific software applications that provide automation support for the commander and staff at formation and unit levels.
Tactical Communications	Tactical Communications (TacCOMS) is the physical Communications System (CS) that enables commanders at all levels to have access to a fully integrated, secure communications system that gives the capability to carry out tasks through voice and/or data communications. TacC2IS services are transported over TacCOMS.
Technical Failure Report	A Technical Failure Report (TFR) (form CF2239) is used by the Canadian Armed Forces (CAF) to report technical failures with CAF equipment. It is generated by the field force for items requiring national attention.
Technical Office of Primary Interest	A Technical Office of Primary Interest (Tech OPI) is a civilian or military employee of Canada designated by the Technical Authority to manage day-to-day tasking related activities and associated core activities performed in support of a tasking or potential tasking for a given scope of work.
Total System Responsibility	Total System Responsibility (TSR) is the responsibility over the requirements, design and resulting performance of the system.
Unforecast Operational Requirement	An Unforecast Operational Requirement (UOR) is defined as a requirement that is essential to the safe and/or effective conduct of an operation that cannot be satisfied from existing stocks or ongoing authorized procurement. UOR

	submissions are to be used only for current or planned operations. They are not to be used to obtain equipment in anticipation of requirements.
Unsatisfactory Condition Report	A Unsatisfactory Condition Report (UCR) (form CF777 / CF777-A) used by the Canadian Armed Forces (CAF) to: a. Identify deficiencies in material (e.g. faulty design or workmanship, inadequate for the intended purpose, unreliable, inadequate operational performance, difficult to operate and maintain); b. Identify deficiencies in policies or procedures (e.g. change in policy, poor operator or technical manuals) c. Identify potential and actual hazards to personnel, material and property; and d. Allow a formal means to transfer equipment (including software) knowledge and expertise between user Units and the Technical Authority (TA).
Validation	Validation relates back to the concept of operations document. Validation testing is conducted under realistic conditions (or simulated conditions) on the Land C4ISR Capability to determine the effectiveness and suitability of the product for use in mission operations by typical users and to evaluate the results of such tests. Validation activities are only conducted in the Land C4ISR SoS Engineering and Integration Functional Grouping.
Verification	Verification testing relates back to the approved requirement set and can be performed at different stages in the product life cycle. Verification testing includes: (1) any testing used to assist in the development and maturation of Products, Systems, or manufacturing or support processes and/or (2) any engineering-type test used to verify the status of technical progress, substantiate achievement of contract technical performance and certify readiness for initial validation testing. Verification tests use instrumentation and measurements and are generally accomplished by engineers and technicians in a controlled environment.

3 List of Abbreviations and Acronyms

Abbreviation	Term
ANSI/EIA	American National Standards Institute / Electronic Industries Alliance
ATE	Automated Test Equipment
BLOS	Beyond Line of Sight
C2	Command and Control
C4	Command, Control, Communications and Computing

C4ISR	Command, Control, Communications, Computing, Intelligence, Surveillance and Reconnaissance
CCB	Configuration Control Board
CDRL	Contract Data Requirements List
CAF	Canadian Armed Forces
CFQAR	Canadian Forces Quality Assurance Representative
CFSS	Canadian Forces Supply System
CFTO	Canadian Forces Technical Order
CGP	Controlled Goods Program
CI / CD	Continuous Integration / Continuous Delivery
CO-CO	Contractor Owned (or supplied) – Contractor Operated
COTS	Commercial Off The Shelf
CITP	Canadian Industrial TEMPEST Program
CM	Configuration Management
CM-DM	Configuration Management – Data Management
CMMI	Capability Maturity Model Integration (Sometimes not defined in SOWs)
CRPA	Contractor Repair Parts Account
CR	Change Request
CSA	Configuration Status Accounting
CSCI	Computer Software Configuration Item
DA	Design Authority
DAR	Design Analysis and Resolution
DCC	Document Control Center
DCG	Document Control Group

DID	Data Item Description
DLCSPM	Director Land Command Systems Program Management
DM	Data Management
DMS	Diminishing Manufacturing Source
DMSMS	Diminishing Manufacturing Sources and Material Shortages
DND	Department of National Defence
DQA	Directorate of Quality Assurance
DSL	Data Services Layer
DWAN	Defence Wide Area Network
DWD	Detailed Work Description
E&I	Engineering and Integration
E3	Electromagnetic Environment Effects
EBS	Engineering Breakdown Structure
EC	Engineering Change
EM	Electromagnetic
EMC	Electromagnetic Compatibility
EME	Electromagnetic Environment
EMECE	Electromagnetic Environment Control Engineer
EMI	Electromagnetic Interference
EP	Engineering Plan
FCA	Functional Configuration Audit
FRACAS	Failure Reporting and Corrective Action System
FSR	Field Service Representative
GFA	Government Furnished Assets

GFE	Government Furnished Equipment
GFF	Government Furnished Facility
GFI	Government Furnished Information
GFV	Government Furnished Vehicle
GIDEP	Government-Industry Data Exchange Program
GO-CO	Government Owned (or supplied) – Contractor Operated
GO-GO	Government Owned (or supplied) – Government Operated
GOTS	Government Off The Shelf
GPS	Global Positioning System
GSM	Government Supplied Material
HQ	Headquarters
HW	Hardware
HWCI	Hardware Configuration Item
HFE	Human Factors Engineering
ICD	Interface Control Document
ITSM	Information Technology Service Management
IEC	International Electro-technical Commission
IEEE	Institute of Electrical and Electronic Engineers
IEM	Integrated Exchange Mechanism
IIE	Integrated Information Exchange
ILS	Integrated Logistics Support
ILSP	Integrated Logistics Support Plan
INCOSE	International Council on System Engineering
IPT	Integrated Product Team
ISO	International Organization for Standardization (not an acronym)
ISR	Intelligence, Surveillance and Reconnaissance

ISS	In-Service Support
ISTAR	Intelligence, Surveillance Target Acquisition and Reconnaissance
ITAR	International Traffic in Arms Regulations
IV&V	Independent Verification and Validation
ITE	Integrated Test Environment
KMS	Knowledge Management System
LAN	Local Area Network
LCAM	Life Cycle Application Manager
LCMM	Life Cycle Material Management
LTSC	Long Term Support Contract
MCN	Material Change Notice
MDA	Model Driven Architecture
MND	Minister of National Defence
MOTS	Military Off The Shelf
MPR	Monthly Progress Report
MR	Modification Request
MRP	Mobile Repair Party
NATO	North Atlantic Treaty Organization
NDHQ	National Defence Headquarters
NDQAR	National Defence Quality Assurance Representative
NSL	Notification Service Layer
NSN	NATO Stock Number
ODB	Operational Database
OEM	Original Equipment Manufacturer

OGD	Other Government Departments
OMG	Object Management Group
OPI	Office of Primary Interest
OT&E	Operational Test & Evaluation
OTS	Off The Shelf
PA	Procurement Authority
PCA	Physical Configuration Audit
PMP	Project Management Plan
PRM	Progress Review Meeting
PRR	Priority Repair Request
PSPC	Public Services and Procurement Canada
QA	Quality Assurance
QAP	Quality Assurance Plan
QAM	Quality Management
RFP	Request for Proposal
ROD	Record of Discussion
R&O	Repair & Overhaul
RADHAZ	Radiation Hazard
RAMD	Reliability, Availability, Maintainability and Durability
RCIED	Radio-Controlled Improvised Explosive Device
RM	Requirement Management
RMA	Repairable Materiel Account
RMR	Repairable Materiel Request
RSA	Repair Shop Account

SNAPS	Selection Notice and Priority Summary
SNOM	Selection Notice Observation Message
SOA	Service Oriented Architecture
SBIT	Software Baseline Integration and Testing
SDE	Software Development Environment
SDP	Software Development Plan
SEI	Software Engineering Institute
SOCD	Statement of Capability Deficiency
SOW	Statement of Work
SHC	Stock Holding Code
SC	Support Contract
SEM	System Engineering Management
SDD	System or Software Design Document
SE	System Engineering
SEMP	System Engineering Management Plan
SI	System Integration
SoS	System of Systems
SoSDE	System of Systems Development Environment
SoSITE	System of Systems Integration and Test Environment
SPR	System Problem Report
SR	System Release
SRS	System Requirement Specification
SW	Software
SWS	Software Support

SWSE	Software Support Environment
TA	Technical Authority
TacC2IS	Tactical Command and Control Information Systems
TacCOMS	Tactical Communications
TacNet	Tactical Networks
TDP	Technical Data Package
TFR	Technical Failure Report
TIES	Technical Investigation and Engineering Support
TSR	Total System Responsibility
UCR	Unsatisfactory Condition Report
UML	Unified Modelling Language
UOR	Urgent Operational Requirement
UX	User Experience
VDD	Version Description Document
VE3T	Vehicle Electromagnetic Environmental Effects Testing
VIT	Vehicle Installation and Testing
WSM	Weapons Systems Management