Thematic Evaluation of Equipment Acquisition Effectiveness

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ACRONYMS

ADM(Mat) – Assistant Deputy Minister (Materiel)
ADM(RS) – Assistant Deputy Minister (Review Services)
BCA – Business Case Analysis
CAF – Canadian Armed Forces
CAS – Chemical Agent Sensor
CBP – Capability-based Planning
CFD – Chief of Force Development
CL– Closeout
C Prog – Chief of Programme
DCB – Defence Capabilities Board
DEF – Definition
DGAEPM – Director General Aerospace Equipment Program Management
DGLEPM – Director General Land Equipment Program Management
DGMEPM – Director General Maritime Equipment Program Management
DGMPD A&L - Director General Major Project Delivery (Air & Land)
DGMPD (Sea) - Director General Major Project Delivery (Sea)
DG Proc Svcs – Director General Procurement Services
DND – Department of National Defence
DOORS - Dynamic Object Oriented Requirements System
FCP – Force Capability Plan
FOC – Full Operational Capability
FOCC – Full Operational Capability Certificate
FY – Fiscal Year
GBA Plus – Gender-based Analysis Plus
GC – Government of Canada
GLLE – Griffon Limited Life Extension
GSR – Guiding Statement of Requirement
HLMR – High Level Mandatory Requirement
ID – Identification
IMP – Implementation
IOC – Initial Operational Capability
IOCC – Initial Operational Capability Certificate
IRMC – Investment and Resource Management Committee
IRP – Independent Review Panel
IRPDA – Independent Review Panel for Defence Acquisition
IRPDAO – Independent Review Panel for Defence Acquisition Office
ISED – Innovation, Science and Economic Development Canada
IT – Information Technology
LWTH – Light Weight Towed Howitzer
MFATMA – Multi-Fleet Air Traffic Management Avionics
MND – Minister of National Defence
MRB – Multi-Role Boat
NLT – Naval Large Tugs
OA – Options Analysis
OCI – Office of Collateral Interest
OPI – Office of Principal Interest
OR – Operational Requirement
PA – Project Approval
PAD – Project Approval Directive
PAP – Project Approval Process
PC – Project Charter
PD – Project Director
PM – Project Manager
PMB – Programme Management Board
PMEC – Performance Measurement and Evaluation Committee
PMP – Project Management Plan
Pre-ID – Pre-Identification
PSPC – Public Services and Procurement Canada
RCAF – Royal Canadian Air Force
RCN – Royal Canadian Navy
RFP – Request for Proposal
SER – System Effectiveness Requirements
SME – Subject Matter Expert
SOCD – Statement of Capability Deficiency
SOR – Statement of Operational Requirements
SRB – Senior Review Board
SRD – System Requirements Document
TAPV – Tactical Armoured Patrol Vehicle
TB – Treasury Board
TBS – Treasury Board of Canada Secretariat
T-DEF – Transition to Definition
T-IMP – Transition to Implementation
TR – Technical Requirement
VCDS – Vice Chief of the Defence Staff

EXECUTIVE SUMMARY

The evaluation focuses on the extent to which equipment acquisition projects remain aligned with the needs of the Canadian Armed Forces (CAF). This evaluation was launched at the same time as both the Chief of Force Development (CFD) and the Independent Review Panel for Defence Acquisition Office (IRPDAO) expressed an interest in examining the effectiveness of High Level Mandatory Requirements (HLMR) in the acquisition process. As such, this evaluation narrowed its focus to examine the role of HLMRs during the Implementation phase of acquisition projects. The evaluation was conducted in compliance with the Departmental Evaluation Plan, approved by the Performance Measurement and Evaluation Committee (PMEC), and with the Treasury Board of Canada Secretariat (TBS) *Policy on Results (2016).*

Program Description

Three DND/CAF Programs were included in this evaluation: Maritime; Land; and Aerospace Equipment Acquisition. All three programs seek to acquire new or modernized equipment required by the CAF through the Definition and Implementation phases of approved capital equipment projects.

Scope

The objective of this evaluation is to examine the extent to which defence equipment acquisition projects consistently align with the needs of the CAF. Ensuring this alignment ensures the CAF can carry out its intended capabilities in the field and contribute to Force Readiness**.** In 2015, HLMRs were introduced to clarify the main objectives of a project, underpin the project's option's analysis and better align projects with the DND/CAF Capability Based Planning outcomes.[1] Given the alignment role HLMRs are designed to play, the evaluation focused its scope to examine if HLMRs play their intended role in ensuring that the final piece of equipment resolves CAF capability deficiency (gaps). The evaluation also sought to examine how equipment acquisition projects contribute to Force Readiness.

Results

HLMRs play their intended role during project planning, but clear traceability between HLMRs and subsequent requirements was not well established or maintained during project implementation. When projects change scope past the planning phase, there is no evidence these changes are compared against the original equipment needs of the CAF or the HLMRs to ensure they still align. For example, three case study projects made changes to project scope following engagement with industry, and one project noted scope changes due, in part, to costs and schedule changes. A check against HLMRs was not noted. There is often a reluctance to change the HLMRs during the project implementation stages due to a perceived lengthy amendment process. The impact of this unclear trail back to the original expression of CAF needs increases the risk that a delivered capability would not be operationally useful and/or may provide an insufficient improvement over the status quo, thus prolonging a CAF capabilities gap. In turn, a lack of alignment between the project and CAF equipment needs could put general Force Readiness at risk.

Overall Conclusions

Clear traceability between HLMRs and subsequent project scope was not well-established and/or consistently identified. The weaknesses in documentation makes it difficult to conclude if and how the equipment acquired will meet the previously identified needs of the CAF and, once delivered, contribute to Force Readiness.

Recommendations

1. Clarify the roles and responsibilities of those responsible for tracing HLMRs, as well as improve training and resources for proper tracing.
2. Clarify how project scope, and changes to it, should be aligned with the original CAF needs and HLMRs throughout the project's lifetime, including the role of HLMRs particularly during the Definition and Implementation phases.

EVALUATION SCOPE

Coverage and Responsibilities

The objective of this evaluation is to examine the extent to which defence equipment acquisition projects consistently align with the needs of the CAF. Specifically, the evaluation sought to determine if acquired equipment would meet the needs of CAF stakeholders and to what extent the equipment would contribute to operational readiness. The evaluation also examined the role HLMRs play in ensuring traceability (or alignment) between the capability deficiencies originally defined by the CAF and the acquired equipment. This evaluation was launched at the same time both CFD and the IRPDAO expressed an interest in examining the effectiveness of HLMRs in the acquisition process. As such, this evaluation narrowed its focus to examine the role of HLMRs during implementation phases of acquisition projects. Information about the programs included in this evaluation can be found in Annex C.

Noting that a number of audits and evaluations of the acquisition process were taking place concurrently, and other studies were being planned, this evaluation examined six equipment acquisition projects as current examples of how acquisition guidance was applied in practice. While the evaluation did not provide an exhaustive examination of all acquisition projects, it sought to identify best practices and challenges that are occurring in the current context.

Evaluation Questions

The evaluation sought to answer the following two core questions:

1. To what extent did the acquired equipment (or will the latest version of the equipment) fill the original capability deficiencies?
   a. To what extent does the Acquisition Process influence the alignment between the originally identified capability deficiency and the final product?
   b. To what extent did HLMRs play a role in aligning the equipment capabilities with the original capability deficiency?
2. To what extent did/will the acquired equipment contribute to operational readiness?

Methodology

A process-based approach was used to examine the effectiveness (or anticipated effectiveness) of DND/CAF in acquiring equipment that meets CAF needs, using six acquisition case study projects as examples. The evaluation also used the Causal Link Monitoring methodology.

Case Study Projects

Since 2015, DND policies require equipment acquisition projects to include HLMRs; only projects with HLMRs were included in the case studies. The selected projects were among those furthest along in the Project Approval Process (PAP) (see Annex D - F) with HLMRs.

Environment	Case Study Project	Annex
Aerospace Equipment Acquisition	Griffon Limited Life Extension (GLLE)	G
Aerospace Equipment Acquisition	Multi-Fleet Air Traffic Management Avionics (MFATMA)	H
Maritime Equipment Acquisition	Multi-Role Boat (MRB)	I
Maritime Equipment Acquisition	Naval Large Tugs (NLT)	J
Land Equipment Acquisition	Chemical Agent Sensor (CAS)	K
Land Equipment Acquisition	Light Weight Towed Howitzer (LWTH)	L

Detailed information about the evaluation methodology, limitations and the selection of case study projects can be found in Annex M.

FINDING 1: HLMRs generally played their intended role during project planning

HLMRs play a role in project planning phases.

HLMRs are foundational statements of specific CAF capability deficiencies and outline the objectives of a project.[2] Guidance documents indicate that HLMRs are used during the project planning phases to guide the development of the project scope, in particular the specific operational requirements for which the equipment must be used in the field.[3] HLMRs are also used to determine which project option would best meet CAF needs.[4] In practice, the evaluation's group of Subject Matter Experts (SME) noted that HLMRs are useful during the project planning phases because they provide a clear project objective, help design the subsequent project scope, and assist with assessing project feasibility when selecting project options. However, HLMRs were also criticized for often being poorly written, making it difficult to use them to further design the project scope.

> *"HLMRs cannot be developed, nor understood, in isolation from other elements of a project." - Vice Chief of the Defence Staff, High Level Mandatory Requirements in Support of the Business Case Analysis (2019)*

Most case study projects used the HLMRs for their intended purpose during the project planning stages.[5] Four of the six case study projects (MRB, NLT, GLLE and MFATMA) used HLMRs to develop the project scope, demonstrating clear alignment between the HLMRs and subsequent project details. In addition, five case study projects used HLMRs to select the most cost-effective project option that would respond to CAF equipment needs. The CAS did not have HLMRs but used System Effectiveness Requirements (SER) in a similar manner. While CAS used HLMRs to further describe the needs of the CAF, they did not use SERs to select the most cost effective project option. They did link the SERs to the project scope (specifically the equipment's technical requirements) later in the project.

LWTH: Early Breakdown in HLMR alignment with Project Scope

The LWTH project did not demonstrate a link between the HLMRs and the rest of the project scope during the planning phases of the project.[6] While the project was effectively completed in 2018, this early breakdown in the alignment of project scope with HLMRs poses a risk that the acquired equipment may not meet the project's original objectives or CAF needs once delivered.

Photo credit: Cpl Matthieu Racette, Valcartier Imaging Services VL11-2017-0028-007

FINDING 2: There is a breakdown in alignment between HLMRs and project scope during the implementation phases

HLMRs' role during implementation stages is unclear.

Both the 2019 Vice Chief of the Defence Staff (VCDS) HLMR Directive and the Project Approval Directive (PAD) guide outline that projects should be traced back to HLMRs through the project lifecycle, using measures of the HLMRs.[7] The guidance documents also indicate that HLMR measures should have a clear pass/fail criteria. The use of "tracing" tools is also recommended to track alignment between the project scope and the HLMRs throughout the project.[8] The guidance documents do not, however, provide any additional direction on how to develop a methodology for measuring or tracing HLMRs throughout the project's implementation stages.

The responsibility for ensuring project alignment with HLMRs during implementation stages is also unclear.

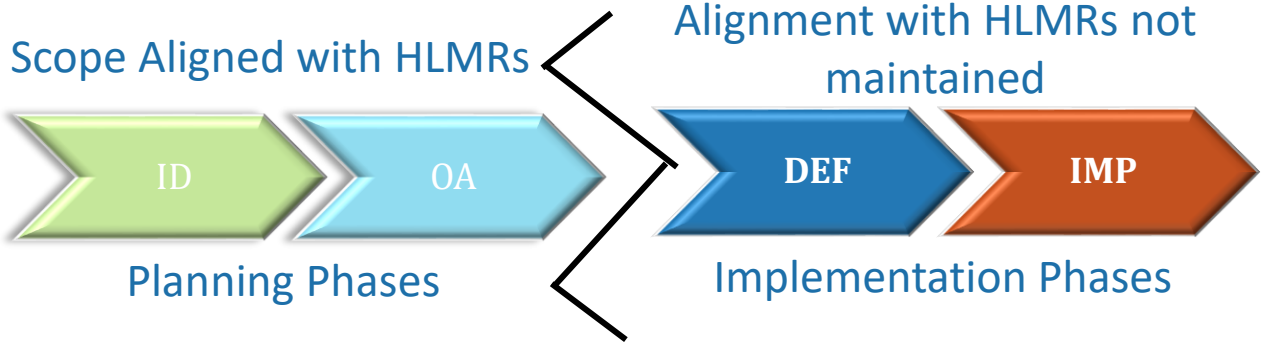
The PAD states "maintaining clear traceability between [HLMRs] and subsequent requirements, is a key task for project teams." While the Project Team includes a Project Director (i.e., Sponsor) and a Project Manager (i.e., Assistant Deputy Minister (Materiel) (ADM(Mat)), the PAD does not clarify which team member is responsible for tracing HLMRs throughout the acquisition process. ADM(Mat) SMEs indicated tracing HLMRs was the responsibility of Project Sponsors. C Prog SMEs concurred. In contrast, Project Sponsors reported the responsibility for tracing was that of ADM(Mat).

Sponsors for the case study projects reported that only one training course was available to them before they took on their role. In addition, they noted the resources provided to them through the training and from the previous Sponsors were insufficient to effectively take over the management of the project.[9] If Project Sponsors are responsible for tracing HLMRs during project implementation, the lack of clarity around responsibilities could be due to a lack of training and resources.

R Clarify the roles and responsibilities of those responsible for tracing HLMRs, as well as improve training and resources for proper tracing.

None of the case study projects track HLMRs during the project implementation phases.

As a result of the lack of clarity around the role of HLMRs during the implementation phases, none of the case study project teams measure or track HLMRs during the implementation phases.



MFATMA and GLLE attempted to link HLMRs to the performance measures but the measures speak to the success of the project (e.g., meeting timelines), not the HLMRs themselves.[10] While all the projects use a tool to track the project scope,[11] none of the projects link HLMRs to the rest of the project scope in these tools. Instead, the tools demonstrated the alignment between other aspects of the project scope, such as between the operational and technical requirements. See Annex N for more information on traceability practices.

Only two projects presented risks to the project scope, due to project changes, to oversight committees.[12]

Only two case study projects [GLLE and MFATMA] regularly presented risks to project scope, HLMRs, and impact on CAF operations to oversight committees due to changes to the project. Only rarely were risks to scope addressed in the committees' records of decision. The other case study projects (CAS, LWTH, NLT and MRB) rarely mentioned project scope, HLMRs or the impact on CAF operations in their presentations. Many factors can result in a change to project scope.

FINDING 2: Continued

GLLE: Tracing Tools

While GLLE was the only project to include HLMRs in their tracing tool during the implementation phases, the HLMRs were not linked to the other aspects of the project scope[13] in a way that would allow the tracking tool software to signal a need to re-examine the HLMRs if the project scope were to change. There is currently no evidence of whether changes to the project scope impact the project's ability to deliver the HLMRs.

Project scope can change during the implementation phases.

All six case study projects made significant changes to the project scope during implementation phases of the project. The reasons for these changes were most often due to budget[14] and industry capacity to deliver the equipment as originally designed.[15]

Project Scope Changes During Implementation

Case Study Project	Change
CAS	Removed 27 requirements from the project scope.[16]
LWTH	Made four changes to the equipment's operational requirements for the field.[17]
MRB	Forty-eight changes to the equipment's technical requirements were recorded.[18]
NLT	Made 331 changes to the equipment's technical requirements.[19]
GLLE	Created a Change Request for four changes to the equipment's intended operational requirements in the field.[20]
MFATMA	Recorded 14 changes to project scope in its tracking documents but did not specify what aspect of the project scope was changed.[21]

As none of these projects linked its project scope (including operational and technical requirements) to the HLMRs,[22] it is unclear if the acquired equipment will align with the project's original objectives or meet CAF needs.

Changes to project scope were not verified against the HLMRs.

Project tracing documents do not provide evidence that changes to project scope were compared against the HLMRs to ensure the project would still meet its original needs. Instead, when tracing was conducted, the documents focused on whether changes to the equipment's technical requirements would impact the equipment's anticipated operational requirement in the field.[23] Despite the fact that HLMRs are used to guide the development of operational requirements, there was no evidence that changes to the projects' operational requirements were compared against the HLMRs.

LWTH: Scope changes were not compared against HLMRs.

In June 2013, the LWTH Senior Review Board agreed to increase the minimum temperature of the CCF/PKG fuze from -46 C to –32 C.[24] This would restrict the use of the LWTH in the Arctic to the short summer months, as average temperatures in the winter is two degrees colder (-34 C). The HLMR originally called for the LWTH to withstand temperatures of -46 C; however, there are no records of this change escalating to the Defence Capabilities Board (DCB) to examine the impact of the change on the HLMRs nor is there evidence the HLMRs were updated. As such, the final product may not achieve all the HLMRs.

Clarify how capability requirements and changes to them should be traced back to the capability deficiency throughout the PAP, including the role of HLMRs during the Definition and Implementation phases.

FINDING 2: Continued

HLMRs are not updated when project context changes.

Not only are changes within the project scope not tracked back to HLMRs, but changes to the project's external pressures are also not compared against HLMRs. Such external pressures could include the ability of industry to deliver equipment that meets the HLMRs or changes to the threat environment in which the equipment would be used. Project teams noted that HLMRs seldom change during the project implementation phases as the process for changing the HLMRs is understood to take a very long time, which would risk delaying the project.[25] As a result, HLMRs are not updated to reflect changing external pressures such as the changing threat environment.

TAPV: Did Not Modernize Project Objectives.

The concurrent *Evaluation of Land Equipment Acquisition Program* (2022)[26] found that the Tactical Armoured Patrol Vehicle (TAPV) equipment acquisition project does not meet the long-term strategic needs of the CAF, and is falling behind evolving global strategic circumstances. As a result, many TAPVs are not being used. If the objectives of the project had been revisited during implementation, the project could have been updated to ensure it was remaining relevant to the changing threat environment.

Equipment risks being unaligned with CAF current needs.

The Evaluation of Ready Land Forces (2022)[27] heard from CAF members that the long procurement process results in equipment being out of date by the time it is delivered. As a result, CAF equipment may not keep pace with that of Canada's allies or stay ahead of the equipment of our adversaries.

Photo credit: Sergeant Vincent Carbonneau, Canadian Forces Combat Camera IS02-2019-0018-013

FINDING 3: As project alignment with CAF needs is not tracked at a strategic level, the CAF cannot demonstrate its progress towards meeting capability requirements or achieving Force Readiness

There is a risk that projects may not meet CAF needs at either the individual project level or at a strategic level.

If Project Teams are not consistently assessing the scope of an acquisition project against the original CAF needs and project objectives (i.e., HLMRs), there is a risk that CAF equipment needs will not be met. In addition, there is no requirement for Project Teams to report their achievement of HLMRs back to an oversight body at the end of a project.[28] In the absence of such a reporting system, it is difficult to demonstrate how individual equipment acquisition projects are meeting the CAF's higher level strategic capability objectives.

A system to track progress towards high-level capability requirements does not exist.

The Force Capability Plan outlines future force capability requirements. At this time, no system exists to track progress towards the requirements outlined in this plan.[29] This means that the progress of individual equipment acquisition projects towards addressing the CAF's strategic level capability needs is not being done. If such a system is to exist in the future, Project Teams will need to consistently track their progress towards CAF needs and HLMRs using a standard method so their results can be collectively analyzed at the strategic level.

The Project Sponsors agree they will support Force Posture and Readiness; however, this is not reflected in the project documentation.

Five of the six Project Sponsors agreed or strongly agreed the project equipment will support Force Posture and Readiness requirements.[30] However, due to the lack of project traceability information, it is difficult to understand how the projects will contribute to Force Readiness.

Furthermore, three of the six projects are scoped to receive fewer components than originally requested in early project documentation.[31] Finally, the original timelines for all six projects have been extended.[32] Such changes and delays could negatively impact the CAF's overall readiness.

GLLE: Project delays may result in equipment being obsolete upon delivery.

The GLLE project is intended to upgrade the Griffon helicopters so they may continue flying into the 2030s.[33] The project was launched in 2013 but did not receive funding until 2017.[34] Due to this initial delay, the project will now only complete the upgrades in 2029,[35] meaning the upgrades will be in place for only six years before the helicopters are replaced. Deciding whether funding for this project should have been directed to the purchasing of new helicopters instead is neither simple nor straightforward. Information that can establish and maintain a link between capability gap and project outcomes can support this decision.

FINDING 3: Continued

Evidence from other evaluations has indicated that the equipment acquisition process is hindering Force Readiness.

The 2016 *Evaluation of Land Readiness*[36] indicates that the lack of replacement vehicles for the foreseeable future would have a negative effect on the Army's Force Readiness, particularly in the Arctic. The current *Readiness Integrated Strategic Analysis (2022)*[37] has also found challenges with the procurement of equipment due to the amount of equipment produced being less than originally planned. There is, therefore, a perceived risk that the current acquisition projects may not be sufficient to effectively support Force Readiness, at either the individual project level or at the higher strategic level.

The lack of HLMRs tracking at the project level and the lack of capability tracking at the strategic level puts the CAF's Force Readiness at risk.

If projects do not track changing project scopes back to the original HLMRs, it is difficult to ensure the project will deliver on its original objectives. Furthermore, if HLMRs are not continuously re-examined and updated to ensure they remain relevant to the changing threat environment, the project may be obsolete once delivered. At a strategic level, if the progress of all acquisition projects towards the CAF's overarching capability requirements is not tracked, it is difficult to determine the CAF's state of readiness. Combined with timeline delays and changes to the number of equipment units being delivered, it is difficult for the CAF to demonstrate the extent to which acquisition projects will address the CAF's capability needs and contribute to Force Readiness.

MFATMA: Project delays may result in fleets being grounded.

The MFATMA project is seeking to upgrade navigation equipment for a number of fleets to allow them to be compliant with current international flight regulations.[38] The fleets received a waiver for these regulations in 2017. The MFATMA project has requested a four month extension to the project closure date to December 2027.[39&40] At least one waiver is due to expire in 2025,[41] so there is a risk that this project delay may result in some fleets experiencing flying restrictions.

Compliance with standards and regulations are limitations applied to the project and do not come from the operational end user (unlike HLMRs). Compliance can be a key driver in a project; for this reason it is recognized they may need to be captured in HLMRs. Documenting the impact of key external drivers on the attainment of HLMRs supports timely communication between stakeholders. Improved HLMR tracking at a strategic level would in turn contribute to improved understanding of the impact on CAF Force Posture and Readiness through the delivery of capabilities by a project (e.g., Initial Operating Capability (IOC) and Final Operating Capability (FOC)). Strategic readiness calculations include IOC and FOC. As such, this evaluation supports the Readiness Evaluation Integrated Strategic Analysis (2022) Recommendation 1: Develop a departmental strategic approach to prioritize and streamline departmental efforts to support holistic CAF readiness. Holistic CAF readiness planning should be revisited on a cyclical basis to ensure alignment with broader objectives and changes in the future threat landscape.

CONCLUSION

HLMRs are intended to be aligned with the project scope throughout an equipment acquisition project, using a measureable and clear pass/fail criteria, in order to ensure the final product meets the capability needs of the CAF. In practice, the HLMRs play their intended role during the planning phases of a project by providing clear objectives, despite needing some refinement in how they are written. The role of HLMRs is, however, less clear during the project implementation phases, where HLMRs are not consistently measured or tracked to ensure the project remains in line with its original objectives.

The role of HLMRs in ensuring project alignment is particularly relevant when changes are made to the project scope during the implementation phases. However, there was no evidence in the case study projects that the HLMRs were examined after a change to the project scope to ensure project alignment. There appears to be resistance, in practice, to returning to the HLMRs in case this triggers a need to change the HLMRs themselves; a process that is poorly understood and perceived to be very time consuming.

Guidance documents should clarify how project scope, and changes to it, should be traced to the HLMRs throughout the project's lifetime, particularly during the project's implementation phases. The roles and responsibilities for tracing HLMRs should also be clarified. In addition, more training and resources for proper tracing practices should be developed. There is a risk that if these issues are not addressed, traceability of HLMRs will be lost in the later stages of the acquisition process and, as a result, CAF needs may not be met and Force Readiness may not be achieved.

Annexes

ANNEX A – FINDINGS AND RECOMMENDATIONS

FINDING 1: HLMRs generally played their intended role during project planning.

FINDING 2: There is a breakdown in the HLMRs alignment with project scope during the implementation phases.

Finding 3: As project alignment with CAF needs is not tracked at a strategic level, the CAF cannot demonstrate its progress towards meeting capability requirements or achieving Force Readiness.

Recommendation 1: Clarify the roles and responsibilities of those responsible for tracing HLMRs, as well as improve training and resources for proper tracing.

Recommendation 2: Clarify how project scope, and changes to it, should be aligned with the original CAF capability deficiency and HLMRs throughout the project's lifetime, including the role of HLMRs, particularly during the DEF and IMP phases.

ANNEX B – MANAGEMENT ACTION PLAN

ADM(RS) RECOMMENDATION	
1. Clarify the roles and responsibilities of those responsible for tracing HLMRs, as well as improve training and resources for proper tracing.	**Action 1.1 - Terms of Reference** Initiate PAD amendments to applicable PAD Terms of Reference, in order to reinforce and clarify L1 roles and responsibilities related to HLMR development, validation and alignment, in order to improve capability and Force Development focus past Gateway 3. **OPI:** CFD/VCDS **OCI:** C Prog/VCDS, DCB **Target Date:** Q3 22/23 **Action 1.2 - Capability Launch Meeting** Conceive, design, build and manage a Capability Launch Meeting, comprised of a multidisciplinary team, in order to develop HLMRs, constraints and assumptions, once Gateway 1 has been achieved. **OPI:** CFD/VCDS **OCI:** C Prog/VCDS, DCB **Target Date:** Q1 23/24 **Action 1.3 - Digitization** Investigate and institutionalize, where feasible, digitization tools, Artificial Intelligence, software and resources that enable a digitized Force Development capability. **OPI:** CFD/VCDS **OCI:** DEA/CFD/VCDS, DRDC **Target Date:** Q3 23/24 **Action 1.4 - Training and Standards** Initiate the resourcing and business planning of Force Development Training and Standards Staff. Refine current courseware. Conceive, design, build and manage Force Development and OA phase courseware. **OPI:** CFD/VCDS **OCI:** VCDS **Target Date** Q3 23/24 **Action 1.5 - Force Development and Design Doctrine** Conceive, design, build and manage Force Development and Design Doctrine. **OPI:** CFD/VCDS **OCI:** DCapA /DGCSI/CFD/VCDS **Target Date:** Q3 23/24

ANNEX B – MANAGEMENT ACTION PLAN

ADM(RS) RECOMMENDATION	
2. Clarify how project scope, and changes to it, should be aligned with the original CAF capability deficiency and HLMRs throughout the project's lifetime, including the role of HLMRs, particularly during the DEF and IMP phases.	**Action 2.1 - Force Capability Plan (FCP)** Concurrent to FCP release in the fall of 2022, introduce a requirement for all L1 sponsors to provide periodic FCP progress updates to DCB and IRPDA. **OPI:** CFD/VCDS **OCI:** VCDS, DCB **Target Date:** March 2023 **Action 2.2 - Documentation** Amend current PAP direction and templates to clarify HLMR role within the Statement of Operational Requirements (SOR). **OPI:** CFD/VCDS **OCI:** C Prog/VCDS, DCB **Target Date:** Q4 22/23 **Action 2.3 - HLMR Measurability** Conceive, design, build and manage HLMR Measurability throughout the PAP, amending current direction and applicable templates as required. **OPI:** CFD/VCDS **OCI:** C Prog/VCDS, DCB **Target Date:** Q4 22/23 **Action 2.4 - Measures of Capability** Amend current PAP direction and applicable templates to manage Measures of Capability throughout the PAP. **OPI:** CFD/VCDS **OCI:** C Prog/VCDS, DCB **Target Date:** Q1 23/24 **Action 2.5 - Capability Ladder** Conceive, design, and build Capability Ladder guidance, and incorporate within the PAP direction and applicable templates. **OPI:** CFD/VCDS **OCI:** C Prog/VCDS, DCB, PMB **Target Date:** Q2 23/24

ANNEX C – PROGRAM PROFILE

DND/CAF Programs

This evaluation examined the alignment of acquisition projects with CAF needs and HLMRs across three DND/CAF Programs: Maritime Equipment Acquisition, Land Equipment Acquisition and Aerospace Equipment Acquisition.

Programs' Objectives

The Equipment Acquisition Programs seek to acquire new or modernized equipment required by the CAF through Definition and Implementation of approved capital equipment projects. These programs aim to respond to evolving Defence requirements.

Equipment Acquisition Process

Defence equipment acquisition projects follow the PAP, "which ensures the delivery of Defence Procurement requirements".[42] The PAP is composed of five distinct phases and two transition phases, which are outlined in Annex E.

Program Stakeholders

Groups of Primary Interest

- Project Sponsor from the CAF (Canadian Army; Royal Canadian Air Force (RCAF); Royal Canadian Navy (RCN))
- ADM(Mat)

Groups of Secondary Interest

- IRPDA
- DCB
- PMB
- CFD
- C Prog

Project Sponsor

A member of the CAF acts as the Project Sponsor, also known as the Project Director. They define the project's scope and confirm that delivered capabilities satisfy specified CAF requirements.

ADM(Mat)

A member of ADM(Mat) acts as the Project Manager. They define and implement the acquisition project to obtain the required capability.

Core Responsibility

All three programs fall within DND/CAF Core Responsibility 5: *"Procure advanced capabilities to maintain an advantage over potential adversaries and to keep pace with allies, while fully leveraging defence innovation and technology. Streamlined and flexible procurement arrangements ensure Defence is equipped to conduct missions."*

Performance Indicator Results

Percentage of projects that remain in approved scope, schedule and expenditure authority:

TARGET: 100%

YEAR	LAND	MARITIME	AEROSPACE
2020-2021	100%	100%	88.9%
2019-2020	100%	100%	100%
2018-2019	100%	77.8%	95.8%

NOTE: The performance indicators aim to measure end-year performance at the aggregate level. Therefore, they use the most recent version of the scope, schedule and budget as a baseline. They do not measure the alignment of the project with the original capability deficiency (gap) identified by the CAF, timeline or budget.

ANNEX D – CAPABILITIES OVERVIEW

Capabilities are defined by the Statement of Capabilities Deficiency Guide in the PAD as "the ability to deal with risks identified in scenarios or the risks associated with actual operations." This includes the availability of personnel and materiel as well as quantitative assessment. In the context of equipment acquisition, capabilities are the abilities of the equipment to deal with risk in operational scenarios.

When an equipment acquisition project begins, a **capability deficiency** is defined by the Project Sponsor which identifies the capability gap or problem that the equipment will aim to address, either in full or in combination with other equipment projects.

The capability deficiency is then broken down into **HLMRs**, which are defined in the PAD as "Foundational statements of specific capabilities required by the CAF to meet government defence policy objectives, and they thereby set out the core objectives of the project." In short, the HLMRs state the high-level capability objectives the equipment is meant to accomplish in operational contexts.

The Defence Terminology defines **operational requirements** as "an established need justifying the timely allocation of resources to achieve a capability to accomplish approved military or civil objectives, operations, missions, or actions." In the Statement of Operational Requirements, the HLMRs are then further broken down into more specific Operational Requirements**,** which come in the form of stated performance objectives for the equipment acquisition project, expressed in operational or mission terms. In other words, operational requirements outline what the equipment will be able to accomplish in the context of an operation or mission.

In the System Requirements Document, operational requirements are translated into **technical requirements**. While a specific definition does not exist for this term, for the purpose of this evaluation "Technical Requirements" were defined as the qualities the equipment must have or what the equipment must be able to do.

For the purpose of this evaluation, a general term was required to group the capability deficiency, HLMRs, operational requirements and technical requirements together. CFD recommended the use of the term **"project scope"** for this purpose.

The PAD states that as projects progress through the PAP, each of the project scope requirements should be able to be traceable to (or aligned with) HLMRs. This process of ensuring alignment with HLMRs is know as **tracing** and the extent of the alignment is know as **traceability**.

Additional definitions can be found in Annex O.

ANNEX E – PROJECT APPROVAL PROCESS for DEFENCE EQUIPMENT ACQUISITION

Pre-Identification (Pre-ID) Phase

DND/CAF identifies capability deficiencies (or gaps) that need to be addressed.

Identification (ID) Phase

The Project Sponsor identifies the capability deficiencies in consultation with DND/CAF stakeholders. The Sponsor develops the Strategic Context (i.e., the business need, HLMRs and operational objectives that the equipment will achieve to address the deficiency) and screens the Preliminary Options.

Options Analysis (OA) Phase

The Project Sponsor presents project options, identifying the preferred option that will achieve the HLMRs and best address the capability deficiencies. An option will be endorsed by the SRB and approved by the DCB.

Transition to Definition (T-DEF) Phase

The Project Team receives departmental approval at the PMB, and receives project approval and expenditure authority from the Minister of National Defence (MND) or Treasury Board (TB).

Definition (DEF) Phase

The Project Leader transitions to a member from ADM(Mat) to determine how the preferred option will be implemented. The project scope and schedule will identify the activities and timelines required to accomplish project objectives.

Transition to Implementation (T-IMP) Phase

The Project Team develops and updates documents as required, receives departmental approval at PMB, and receives project approval, expenditure authority, and contracting authority from the MND or TB.

Implementation (IMP) Phase

A contractor is hired to carry out the project under the supervision of the Project Team. DND/CAF tests and verifies complex equipment and requests modifications if needed. When the project is complete, the equipment is delivered to the CAF, along with any necessary training.

Closeout (CL) Phase

The Project Team gives formal notice that the operational capabilities and project conditions has been achieved within the project limitations and that lessons learned have been recorded.

Project Evolution

All projects are assigned a Project Leader to oversee the equipment acquisition project. The Project Leader is from the Project Sponsor organization during the ID and OA phases and then transitions to a representative from ADM(Mat) at the DEF stage. Various stakeholders and governance bodies develop and approve the projects' scope, ensuring that the capability deficiencies are translated to HLMRs, as well as operational and technical requirements. A description of the process for developing and approving equipment acquisition projects is located in Annex F.

ANNEX F – DETAILED PROJECT APPROVAL PROCESS

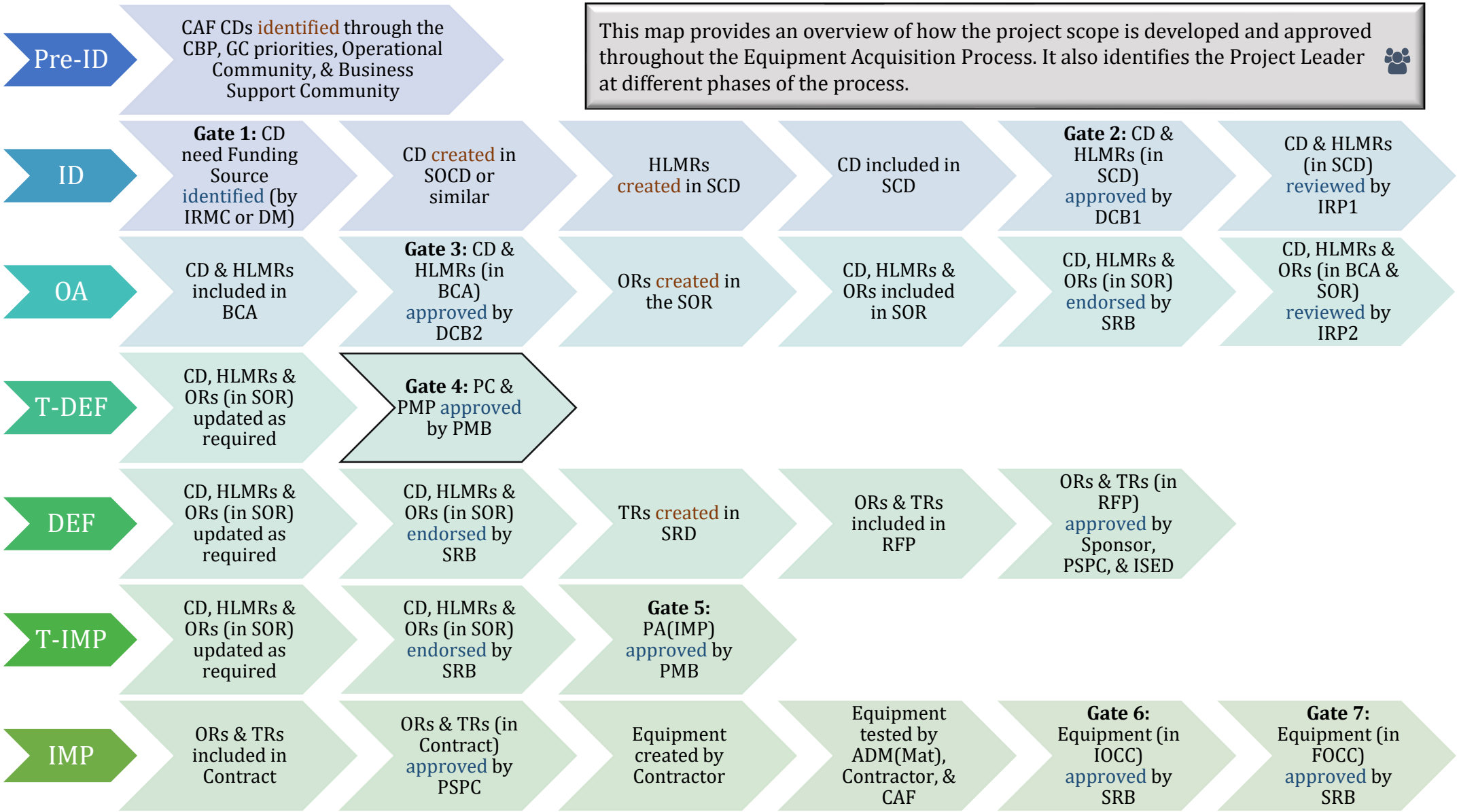
This map provides an overview of how the project scope is developed and approved throughout the Equipment Acquisition Process. It also identifies the Project Leader at different phases of the process.

Sponsor is Project Leader from ID to OA

As Project Director, the Sponsor defines the capability requirements and confirm that the delivered capability satisfies the specified requirements.

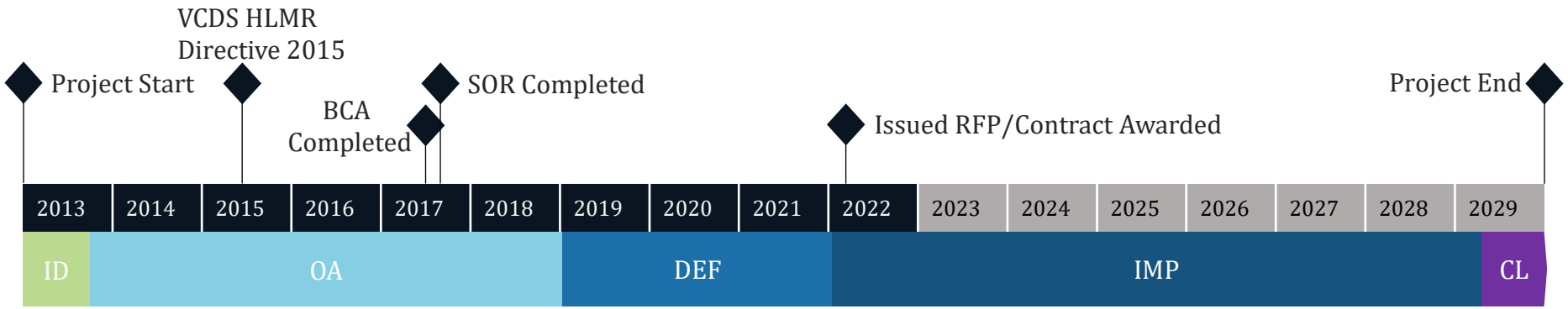
ADM(Mat) is Project Leader from DEF to CL

As Project Manager, ADM(Mat) defines and implements the project to obtain the required capability.



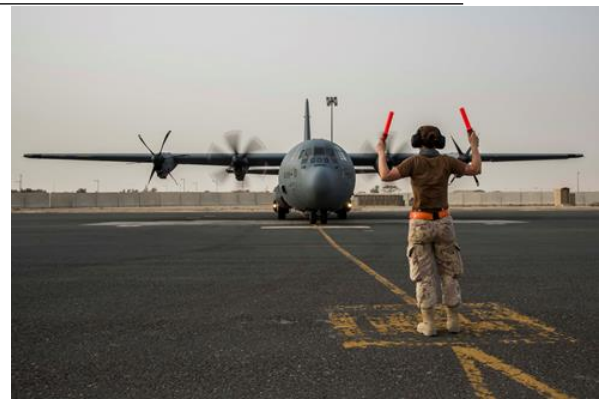
ANNEX G – GRIFFON LIMITED LIFE EXTENSION (GLLE)

Timeline



Traceability Information

Traceability Tools Traceability Matrix IBM DOORS	BCA	Links Capability Deficiency to HLMRs Uses HLMRs to select options
	SOR	Links Capability Deficiency to HLMRs Links HLMRs to performance measures Links HLMRs to operational requirements HLMRs and performance measures reflected in IOC and FOC
	IBM DOORS	Includes HLMRs **Does not link** HLMRs to operational and/or technical requirements Links operational and technical requirements



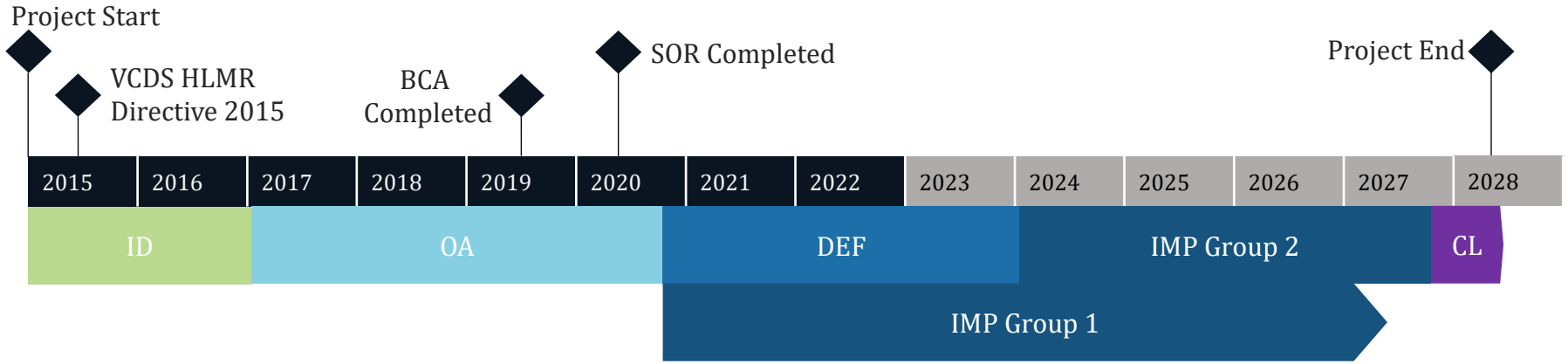
Case Study Summary

The GLLE, initiated in 2013, is meant to extend helicopters' lives to 2030 until replacement crafts are introduced. While the initial estimate for project close-out was 2022, only shortly after its expected end of life, it has since been extended to March 2029.

The Business Case Analysis (BCA) provided a link between the capability deficiency and the HLMRs. HLMRs were also used to select a project option during OA. In the SOR, the Requirements Table identifies to which HLMR each operational requirement is linked. The first HLMR is reflected in one performance measure but no measurement methodology is provided. GLLE included the HLMRs in its DOORS system but does not link the HLMRs to individual operational or technical requirements.

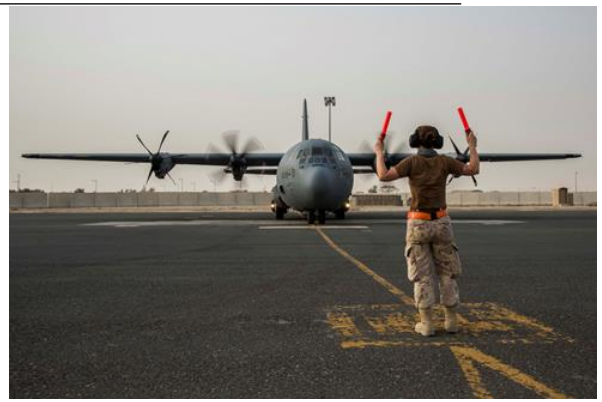
ANNEX H – MULTI-FLEET AIR TRAFFIC MANAGEMENT AVIONICS (MFATMA)

Timeline



Traceability Information

Traceability Tools		
Traceability Matrix	BCA	Links Capability Deficiency to HLMRs Uses HLMRs to select options
Briefing Note	SOR	Links Capability Deficiency to HLMRs HLMRs reflected in performance measures Links HLMRs to operational requirements Links performance measures to IOC and FOC
Transmittal Sheet		
Change Register Worksheet	Change Register	**Does not include** HLMRs **Does not link** HLMRs to operational and/or technical requirements **Does not link** operational and technical requirements



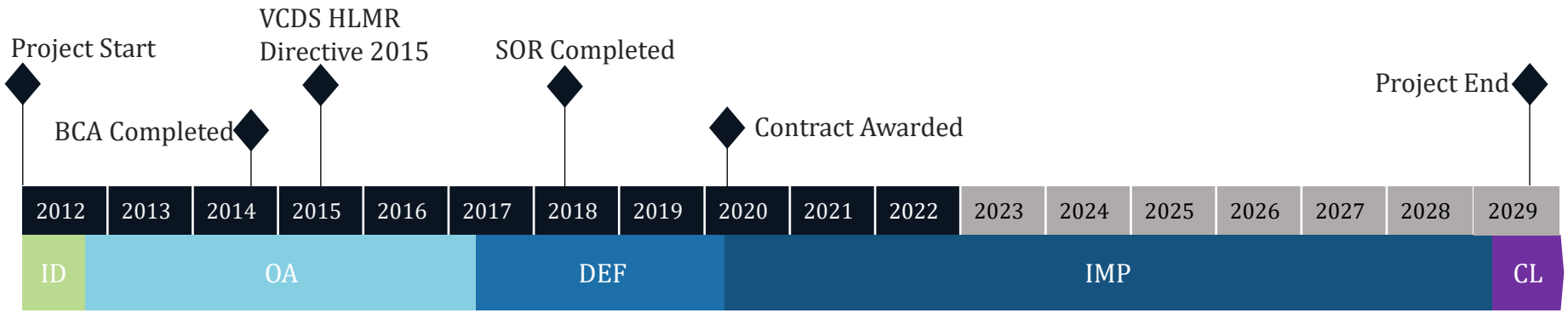
Case Study Summary

The MFATMA project seeks to upgrade the avionics of multiple RCAF fleets found to be non-compliant with air control regulations introduced in 2019. Without the upgrade, RCAF fleets would be unable to conduct operations globally with allied forces. Project close-out has recently been delayed until 2029.

The MFATMA BCA links the HLMRs to the Capability Deficiency and uses the HLMRs to select options during OA. The SOR links the HLMRs to the different systems that need to be upgraded. The performance measure requires 100% of all fleets to be upgraded. No other measure is provided for the HLMRs. Traceability documents provided did not demonstrate a link between the HLMRs and the operational and technical requirements.

ANNEX I – MULTI-ROLE BOAT (MRB)

Timeline



Traceability Information

Traceability Tools

Traceability Matrix

IBM DOORS

BCA	Links Capability Deficiency to HLMRs Uses HLMRs to select options
SOR	Links Capability Deficiency to HLMRs Links HLMRs to tests and trials Links HLMRs to operational requirements Links tests and trials to IOC and FOC
IBM DOORS	**Does not include** HLMRs **Does not link** HLMRs to operational and/or technical requirements Links operational and technical requirements

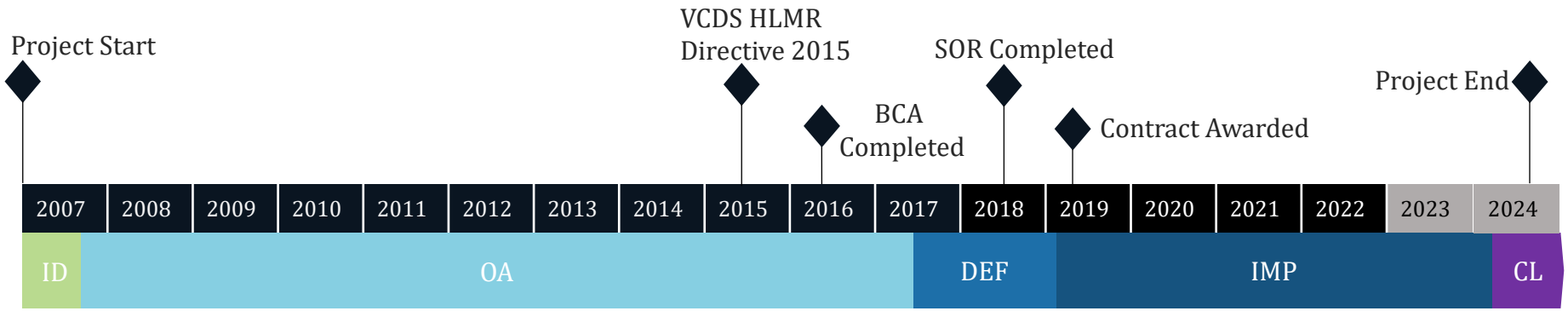
Case Study Summary

The MRB project seeks to replace the existing Halifax-class ships boat system, which is no longer serviceable and not designed for current operations. While the initial project close-out was August 2020, it has since been extended to June 2029.

The BCA links the HLMRs to the capability deficiency, and HLMRs were used to select the project option during OA. While there are no direct measures of HLMRs, they are linked to tests and trials of equipment in the SOR. The DOORS system does not include HLMRs, so the impact of changes to the operational and technical requirements on the HLMRs would not be flagged. As such, HLMRs do not appear to be directly measured or tracked by the project.

ANNEX J – NAVAL LARGE TUGS (NLT)

Timeline



Traceability Information

Traceability Tools

Traceability Matrix

IBM DOORS

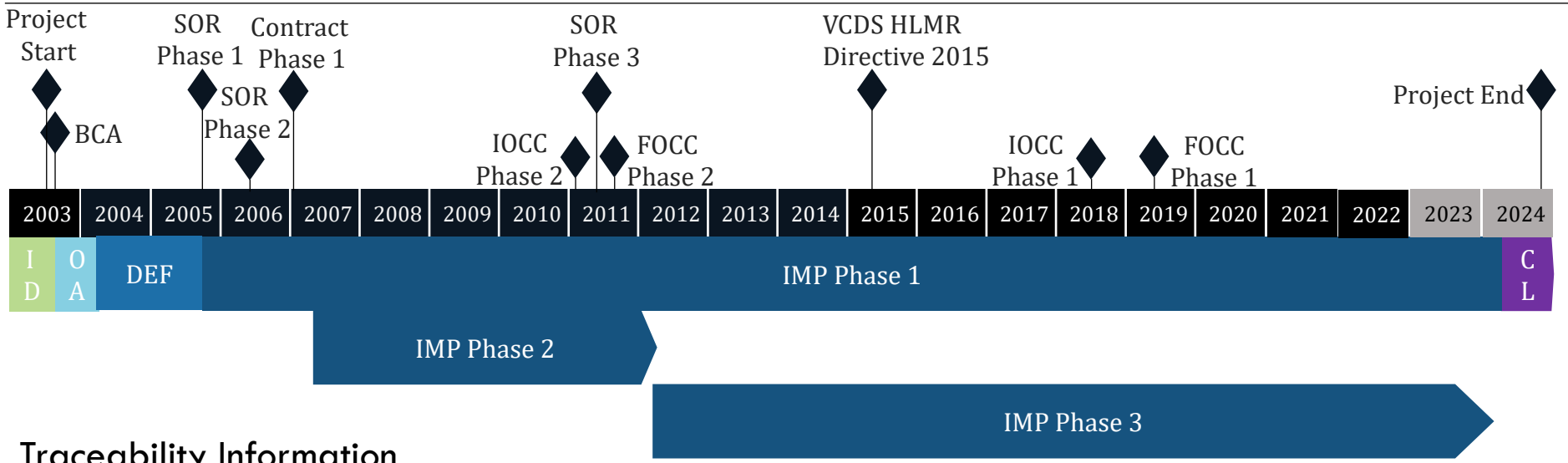
BCA	Links Capability Deficiency to HLMRs Uses HLMRs to select options
SOR	Links Capability Deficiency to HLMRs Links HLMRs to performance measures Links HLMRs to operational requirements Performance measures linked to IOC and FOC
IBM DOORS	**Does not include** HLMRs **Does not link** HLMRs to operational and/or technical requirements Links operational and technical requirements

Case Study Summary

The NLT project seeks to replace existing tug boats that did not have enough power to tow bigger and larger RCN ships. The new tugs will also have firefighting capabilities in order to replace the existing fire-class tug boats. The project will acquire four new tug boats. While the initial project close-out was May 2016, it has since been extended to October 2024.

HLMRs are linked to the capability deficiency, as well as operational and technical requirements in the BCA and SOR. The HLMRs do not have specific measures and are not linked to the performance measures. In the Mandatory Requirements table, the HLMRs are linked to operational requirements. The HLMRs are also not included in the tracing documents provided.

ANNEX K – CHEMICAL AGENT SENSOR (CAS)



Traceability Information

Traceability Tools		
Phase 1: Traceability and Gap Analyses and spreadsheet	BCA	✓ Links Capability Deficiency to System Effectiveness Requirements ✗ **Does not use System Effectiveness Requirements** to select options
Phase 2: Traceability and Gap Analysis	SOR	✓ Links Capability Deficiency to System Effectiveness Requirements ✗ **No direct measure** of System Effectiveness Requirements ✓ System Effectiveness Requirements reflected in performance measures ✓ Links performance measures to IOC and FOC in phase 3 only
Phase 3: Access Database	Traceability Documents	✓ Links System Effectiveness Requirements and technical requirements

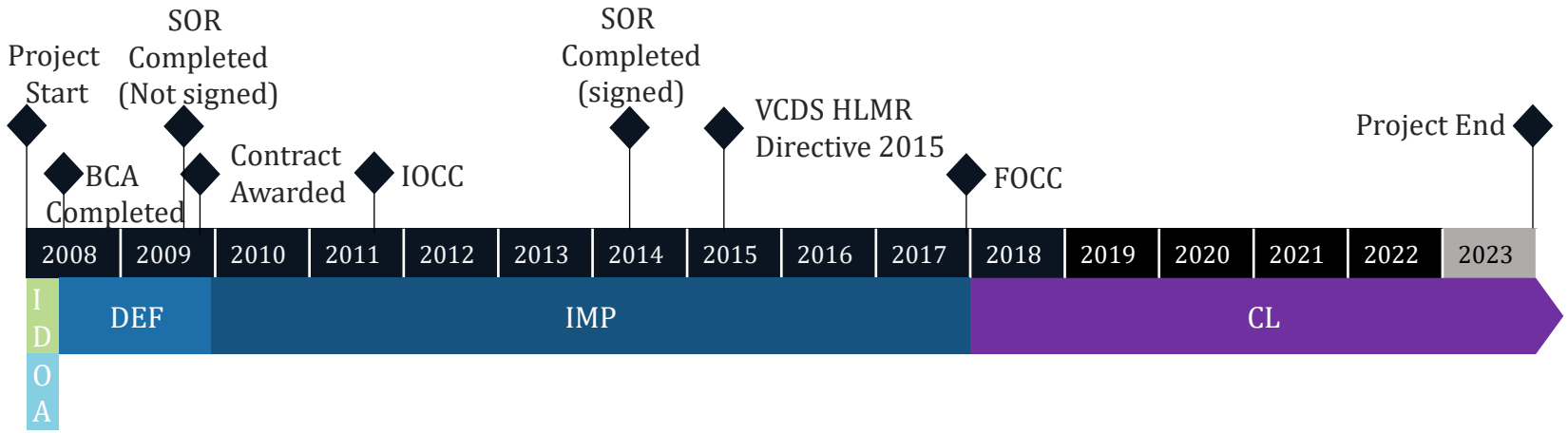
Case Study Summary

The CAS project seeks to provide the CAF with systems allowing for quicker detection and identification of a wider range of chemical warfare agents. These systems would also allow for sample collection. While the initial project close-out was September 2013, it has since been extended to July 2024.

CAS did not use HLMRs but sometimes used System Effectiveness Requirements in a similar way. System Effectiveness Requirements were linked to the capability deficiency in the BCA and SOR, but were not used to select options in the BCA. Performance measures required 100% of System Effectiveness Requirements to be completed. System Effectiveness Requirements and technical requirements were linked in tracing documents.

ANNEX L – LIGHT WEIGHT TOWED HOWITZER (LWTH)

Timeline



Traceability Information

Traceability Tools

SOR Compliancy Spreadsheet

Briefing Note

BCA

- ✓ Links Capability Deficiency to HLMRs
- ✓ Uses HLMRs to select options

SOR

- ✓ Links Capability Deficiency to HLMRs
- ✗ **No direct measure** of HLMRs
- ✓ Some HLMRs are reflected in performance measures
- ✓ HLMRs reflected in operational requirements
- ✓ HLMRs and performance measures reflected in IOC and FOC

SOR Compliancy Spreadsheet

- ✗ **Does not include** HLMRs
- ✗ **Does not link** HLMRs to operational requirements
- ✗ **Does not link** operational requirements

(Project did not require technical requirements because it involved purchasing existing equipment.)

Case Study Summary

The LWTH project seeks to provide the CAF with longer ranged, technology-assisted indirect fire support. While the initial project close-out was June 2013, it has since been extended to December 2023 in order to finalize the project's finances. The equipment was delivered in 2018.

While the capability deficiency is linked to the HLMRs, the HLMRs were not clearly linked to operational requirements in the BCA or SOR. HLMRs are not directly measured but some HLMRs are mentioned in the performance measures. A compliancy spreadsheet was used for tracing but it only included operational requirements, not HLMRs or technical requirements. The LWTH was the only project to have reached CL. The interim project completion report does not include reference to HLMRs.

ANNEX M – METHOLOGY AND LIMITATIONS

Methodology

As the focus of the evaluation was the Equipment Acquisition Process, rather than a specific program, a process evaluation methodology was employed. The evaluation used the Causal Link Monitoring methodology, whereby the process required to achieve a desired result is mapped out and is then used as a baseline against which how the process is employed in practice is compared. In this context, the evaluation compared the acquisition process of six case study projects against the standard acquisition process, as described in various DND guidance documents.

Lines of Evidence

The evaluation used multiple lines of evidence to answer the evaluation questions:

- Document Review of Acquisition Process Guidance Documents and Case Study Documents
- Project Sponsors Questionnaire (*N* = 5)
  ADM(Mat) Project Teams Questionnaire (*N* = 6)
- Subject Matter Experts Group Discussions (*N* = 18)
- Key Informant Interviews (*N* = 19)

Limitations and Mitigation Strategy

As this evaluation used a case study approach and looked at each case at a specific point in time, the results of the case study projects are not a reflection of the situation for all equipment acquisition projects. These case study projects can only be taken as examples of how the policies and procedures can play out in practice. This limitation was mitigated by a review of the policy and interviews with other members of DND/CAF to determine whether the case study examples could play out for other projects due to limitations in policies, procedures and training.

Selection of Case Study Projects

The evaluation sought to identify cases that were developed under the current acquisition policies and procedures. These projects had to be far enough along in the acquisition process to have undergone changes to the project scope. The evaluation sought equal representation from the Maritime, Land and Aerospace Acquisition Programs.

Input from IRPDAO and CFD

Both IRPDA and CFD provided a list of potential projects that used HLMRs. Assistant Deputy Minister (Review Services) (ADM(RS)) removed some projects from this list as they were already being examined by other acquisition evaluations or audits currently underway

Input from ADM(Mat)

The reduced list was provided to ADM(Mat). Members noted that **only two of all DND equipment projects with HLMRs had made it to Close Out (CL)**. One project was removed because evaluation and audit teams had unsuccessfully tried to engage this project. The other project at CL and two other projects on the list were included in the final list.

ADM(Mat) advised the two additional projects were not at CL but were far enough along to provide sufficient information on capability evolution. The final three projects were not on the original list but were identified by ADM(Mat) as meeting the criteria for the evaluation.

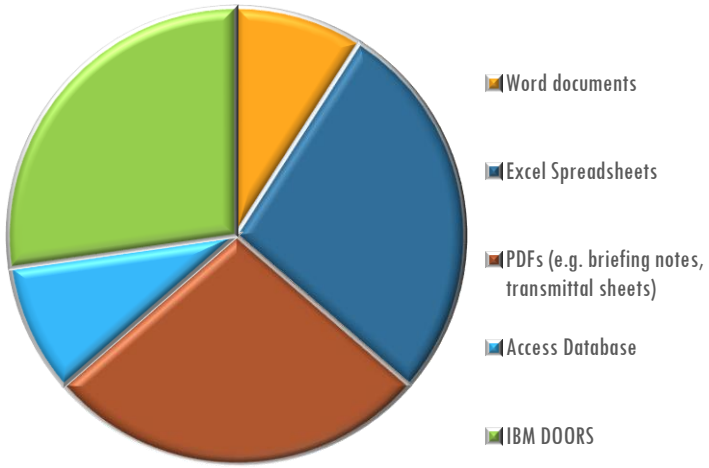
During the document review phase of the project, it was discovered that one of these projects did not have HLMRs because it began prior to the VCDS HLMR Directive 2015. The project remained in the case study as it had high-level requirements that were used similarly to how HLMRs are used today.

ANNEX N – TRACEABILITY SUMMARY

Traceability Tools

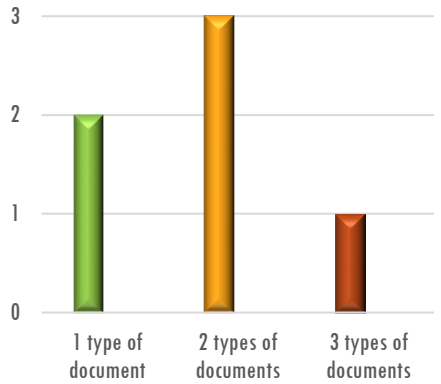
Each case study used different traceability documents during the implementation phases, and tracked information to various levels of details.

Types of Traceability Tools Used



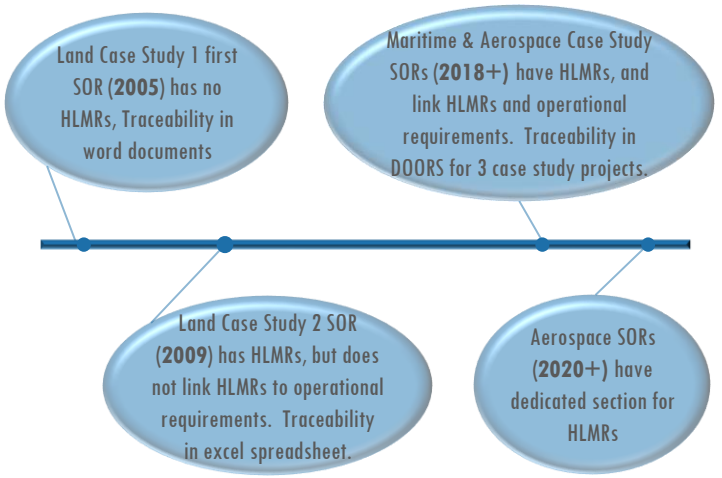
All the projects used different traceability tools.

Number of Traceability Tools Used



Four case study projects used at least two traceability tools.

Improvements to Traceability Over Time



Traceability did appear to have improved over time.

ANNEX O – TERMINOLOGY

Baseline: Project milestones approved by the DCB or when Project Approval (PA) is granted. (PAD, 396)

Capability: The ability to deal with the risks identified in scenarios or the risks associated with actual operations. Includes the availability of personnel and materiel as well as quantitative and qualitative assessment. (SOCD Guide, PAD)

Capability Deficiency: The problem that needs to be resolved by the acquired equipment. (SOCD Guide, PAD)

Capability Based Planning (CBP): The process employed by DND/CAF to determine future force requirements to address capability gaps, surpluses and those which should be sustained. (PAD, 383)

Defence Capabilities Board (DCB): An internal DND governance body which provides the VCDS, on behalf of the DM/CDS, with situational awareness and decision support in the execution of the governance function over Defence Procurement. This board is the approval authority for all Strategic Context Documents and Business Case Analysis (BCA). (PAD, 385)

Final Operational Capability (FOC): The ability to effectively employ a delivered capability for which the required infrastructure, training, staffing and support are fully in place as detailed in the SOR. (PAD, 389)

High Level Mandatory Requirements (HLMR): Foundational statements of specific capabilities required by the CAF to meet government defence policy objectives, and they thereby set out the core objectives of a project. (PAD, 153)

Initial Operational Capability (IOC): The attainment during Implementation of the minimum ability to effectively employ a new or improved capability for which adequate infrastructure, training, staffing and support is in place, both for the new capability and the organization that is employing it. (PAD, 391)

Operational Requirements: An established need justifying the timely allocation of resources to achieve a capability to accomplish approved military or civil objectives, operations, missions, or actions. [Defence Terminology Bank, Record 5707]

Project Director: Functional authority for the operational requirement that leads the effort to identify and obtain approval for the preferred option to satisfy the operational requirement. The PD acts on behalf of the Project Sponsor's organization. (PAD, 397)

Project Implementer: The executive who defines and implements the solution to deliver the required capability, once the DCB has selected an acquisition option with which to proceed following the completion of OA. (PAD, 397)

Project Leader: The appointed individual and single point of accountability who leads the project. The Project Leader for the ID and OA Phases is from the sponsoring organization and transitions to the implementing organization for DEF, IMP, and CL. (PAD, 397)

Project Manager: The individual responsible for the overall direction and coordination of activities during the implementer leadership period of a project. (PAD, 398)

Project Sponsor: The functional authority who defines the requirements for the capability to be implemented and confirms that the delivered capability satisfies the specified requirements. (PAD, 399)

Project Team: Led by a Project Leader and includes a Project Director (PD) and Project Manager (PM), each with complementary responsibilities, assisted by functional members. (PAD, 399)

Statement of Operational Requirements (SOR): Project Sponsor's documentation of the operational requirements stated as the performance objectives of the project in qualitative and quantitative terms. (PAD, 400)

Senior Review Board (SRB): A departmental committee that supports the Project Leader in the successful delivery of the capability for which an investment project has been established. (PAD, 400)

Technical Requirements: For the purpose of this evaluation, this term refers to the qualities the equipment must have or what the equipment must be able to do (e.g., TSORs, System Requirements Specification (SysRS), etc.).

ANNEX P – ENDNOTES

(1) Internal Directive on High Level Mandatory Requirements in Support of Business Case Analysis (2015), VCDS, DND.
(2) Internal Directive on High Level Mandatory Requirements in Support of Business Case Analysis (2019), VCDS, DND; Project Approval Directive – High Level Mandatory Requirements Guide (2019), VCDS, DND. [Last accessed October 24, 2022]
(3) Project Requirements Management, ADM(Mat), DND. Retrieved from: http://materiel.mil.ca/en/business-functions-project-management/project-requirements-management.page [Last accessed October 26, 2022]
(4) Contract Report DRDC-RDDC-2014-C183: High Level Mandatory Requirements (2015), DRDC, DND; Contract Report DRDC-RDDC-2014-C182: Operational Analysis Support to Project Approvals Process (2015), DRDC, DND.
(5) Case Studies Traceability Report - Thematic Evaluation of Acquisition Effectiveness (2022), ADM(RS), DND.
(6) LWTH Statement of Operational Requirements (2014), DND.
(7) Internal Directive on High Level Mandatory Requirements in Support of Business Case Analysis (2019), VCDS, DND; Project Approval Directive (2019), VCDS, DND. [Last accessed October 24, 2022]
(8) Project Requirements Management, ADM(Mat), DND. Retrieved from: http://materiel.mil.ca/en/business-functions-project-management/project-requirements-management.page [Last accessed October 26, 2022]
(9) Sponsor Wrap-Up Meeting Notes - Thematic Evaluation of Acquisition Effectiveness (2022), ADM(RS), DND.
(10) Case Studies Traceability Report - Thematic Evaluation of Acquisition Effectiveness (2022), ADM(RS), DND.
(11) *Ibid*.
(12) Report on presentations to governance bodies – Thematic Evaluation of Acquisition Effectiveness (2022), ADM(RS), DND; Report on Records of Decisions (ROD) – Thematic Evaluation of Acquisition Effectiveness (2022), ADM(RS), DND.
(13) GLLE DOORS database (2022), DND.
(14) Report on presentations to governance bodies – Thematic Evaluation of Acquisition Effectiveness (2022), ADM(RS), DND.
(15) Sponsor and Project Teams Surveys - Thematic Evaluation of Acquisition Effectiveness (2022), ADM(RS), DND.
(16) Chemical Identification System Requirements Traceability and Gap Analysis, DND. Retrieved from: https://gcdocs.gc.ca/forces/llisapi.dll/link/43450795 [Last accessed October 24, 2022]
(17) Briefing Note for DLR: Signature of Lightweight Towed Howitzer (LWTH) Project Statement of Requirements (2014), DND. Retrieved from: https://collaboration-vcds.forces.mil.ca/sites/dspp/1250-1499/C.001350/SOR%20v1@2.2.pdf [Last accessed October 24, 2022]
(18) MRB DOORS Dataset (2022), DND. Retrieved from: https://gcdocs.gc.ca/forces/llisapi.dll/link/44451511 [Last accessed October 24, 2022]
(19) Naval Large Tug Technical Report – Thematic Evaluation of Acquisition Effectiveness (2022), ADM(RS), DND.
(20) Case Studies Traceability Report - Thematic Evaluation of Acquisition Effectiveness (2022), ADM(RS), DND.
(21) *Ibid.*
(22) Triangulation Technical Report - Thematic Evaluation of Acquisition Effectiveness (2022), ADM(RS), DND.
(23) Case Studies Traceability Report - Thematic Evaluation of Acquisition Effectiveness (2022), ADM(RS), DND.
(24) Report on presentations to governance bodies – Thematic Evaluation of Acquisition Effectiveness (2022), ADM(RS), DND.
(25) Triangulation Technical Report – Thematic Evaluation of Acquisition Effectiveness (2022), ADM(RS), DND.
(26) Evaluation of Land Equipment Acquisition Program (2022), ADM(RS), DND. [Last accessed October 24, 2022]

ANNEX P – Continued

(27) Evaluation of Ready Land Forces (2022), ADM(RS), DND. [Last accessed October 24, 2022]
(28)Interviews Technical Report - Thematic Evaluation of Acquisition Effectiveness (2022), ADM(RS), DND.
(29) *Ibid*.
(30) Sponsor Survey Technical Report - Thematic Evaluation of Acquisition Effectiveness (2022), ADM(RS), DND.
(31) Case Studies Readiness Technical Report - Thematic Evaluation of Acquisition Effectiveness (2022), ADM(RS), DND.
(32) *Ibid.*
(33) GLLE Project Brief (Identification) (2013), Directorate of Air Requirements, CAF.
(34) Report on presentations to governance bodies – Thematic Evaluation of Acquisition Effectiveness (2022), ADM(RS), DND.
(35) Case Studies Readiness Technical Report - Thematic Evaluation of Acquisition Effectiveness (2022), ADM(RS), DND.
(36) Evaluation of Land Readiness (2016), ADM(RS), DND. Retrieved from: https://www.canada.ca/en/department-national-defence/corporate/reports-publications/audit-evaluation/evaluation-land-readiness.html [Last accessed October 24, 2022]
(37) Readiness Integrated Strategic Analysis (2022), ADM(RS), DND.
(38) Case Studies Readiness Report – Thematic Evaluation of Acquisition Effectiveness (2022), ADM(RS), DND.
(39) Triangulation Technical Report – Thematic Evaluation of Acquisition Effectiveness (2022), ADM(RS), DND.
(40) The MFATMA project has recently been delayed until 2029. Update on MFATMA Meeting Notes – Thematic Evaluation of Acquisition Effectiveness (October 26, 2022), ADM(RS), DND. Retrieved from: https://gcdocs.gc.ca/forces/llisapi.dll/link/48202224 [Last accessed October 27, 2022]
(41) Report on presentations to governance bodies – Thematic Evaluation of Acquisition Effectiveness (2022), ADM(RS), DND.
(42)Project Approval Directive (PAD) Guide: Chapter 1: The Defence Services Program (DSP) [Last Accessed on September 26, 2022].