Statement of Work (SOW)

for

Calibration Programme
In-Service Support (ISS) Contract

for
The Department of National Defence

Appendix 3

Calibration Programme Description

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1. INTRODUCTION

1.1.1 The information provided in this Appendix is provided as background information and context. The specific requirements and work for the Contractor will be identified elsewhere in this SOW as appropriate.

1.1.2 The Calibration Programme underwent a detailed Calibration Programme Rev and Sustainment Business Case Analysis between 2017 and 2019 as part of the Government's Sustainment Initiative. The resulting Enterprise Sustainment Solution for the Calibration Programme mapped out the Division of Enterprise Scope between the two major components (i.e. in-house and commercial) for the overall management and delivery of services for DND/CAF.

1.1.3 The analysis has reconfirmed the continued need for a central Calibration Programme, consolidated the DND/CAF requirements and helped to focus efforts to update, realign and improve the overall enterprise sustainment solution, specifically in terms of :

a. Programme governance and oversight;

b. Stakeholder engagement;

c. Existing and new programme elements; and

d. Programme management.

2 PROGRAM DESCRIPTION

2.1.1 The DND/CAF Calibration Programme is an essential part of the DND/CAF Materiel Acquisition and Support (MA&S) function with the main goal of ensuring the safe and optimum performance of platforms, weapons systems and equipment by maintaining the quality of measurement and ensuring the proper working of test equipment and instruments used to perform maintenance.

2.1.2 Calibration is a fundamental aspect of maintenance, which also includes inspection, troubleshooting and fault isolation, repair, overhaul, testing, conditioning, modification incorporation, parts recertification, restoration, storage and reactivation, recovery or salvage of technical equipment, servicing and elementary work as specified in approved maintenance procedures for each platform, weapon system or equipment.

2.1.3 DND/CAF currently manages a centralized Calibration Programme. The Assistant Deputy Minister (Materiel) (ADM(Mat)) is the Functional Authority for MA&S. The Quality Engineering Test Establishment (QETE) Superintendent is the Programme Authority. QETE 5 is the Technical Authority responsible to maintain an efficient, cost-effective programme that meets the needs of a broad spectrum of stakeholders throughout DND/CAF and ensures compliance to national and departmental policies and best practices for metrology.

3 SUSTAINMENT OBJECTIVES

3.1.1 The DND/CAF Calibration Programme is an enterprise-level sustainment solution for DND/CAF. The sustainment objectives for the DND/CAF Calibration Programme overall are:

3.1.2 Establish and maintain an efficient and cost-effective, centrally-managed enterprise sustainment solution for the DND/CAF Calibration Programme responsible to the MA&S Functional Authority (i.e. Assistant Deputy Minister (Materiel)) and responsive to the environmental services.

3.1.3 Ensure DND/CAF platforms, weapons systems and equipment are maintained using calibrated Test, Measurement and Diagnostic Equipment (TMDE) to ensure materiel assurance. TDME includes equipment used to measure, calibrate, gauge, test, inspect, diagnose or examine other equipment, material or supplies to determine their compliance with established specifications.

3.1.4 Develop an optimized, integrated solution to provide calibration services such that equipment, instruments, systems and subsystems are calibrated on a recurring basis using commonly accepted metrology principles.

3.1.5 Identify and adapt to evolving requirements for a large variety of key internal stakeholders that includes new capital projects, weapons systems managers, equipment management teams and other DND equipment and sustainment projects undergoing their own revisions of traditional Integrated Logistics Support (ILS), Optimized Weapons System Support (OWSS), In-Service Support (ISS) or Sustainment Business Case Analysis (SBCA) that will impact on special test equipment, support and test equipment, TMDE, metrology expertise for contracting, or overall calibration needs.

3.1.6 Conduct periodic engagements with all key stakeholders with a view to providing metrology advice, managing existing TMDE, and forecasting future requirements that may impact the nature or scope of the Calibration Programme or the Sustainment Business Case, including its commercial contract(s) and departmental capabilities.

3.1.7 Holistically assess the sustainment solution using the Sustainment Initiative Principles (Performance, Value for Money, Flexibility and Economic Benefits).

4 DND/CAF SYSTEM LEVEL OPERATIONAL REQUIREMENTS

4.1.1 The DND/CAF system-level operational requirements for the Calibration Programme overall are:

e. Comply with MA&S Function. Ensure that calibrated equipment and instruments comply with the requirements of the MA&S Functional Authority, Airworthiness, Land Materiel Assurance and Naval Materiel Assurance programmes.

f. Operational Effectiveness. DND/CAF TMDE require periodic calibration to ensure the operational effectiveness of platforms, weapons, equipment and supporting systems.

g. Metrology Principles. The Calibration Programme and metrology Technical Specialty Area (TSA) seeks to ensure that metrology principles are applied throughout the DND/CAF MA&S Function (i.e. uncertainty of measurements, confidence in measurements, calibration, traceability, etc.).

h. Metrological Traceability. All TMDE shall be calibrated at regular intervals through authorized facilities with full metrological traceability. [i, ii, iii]

i. Traceable to Système International (SI). Ultimately, all calibrations conducted must be traceable to the Système International (SI) through one of the following:[iv]

1) Calibrations provided by a competent laboratory;

2) Certified values of certified reference materials provided by a competent producer with stated metrological traceability to the SI; or

3) Direct realization of the SI units ensuring by comparison, directly or indirectly, with national or international standards.

j. Safety. Safety (Airworthiness, Land Materiel Assurance, Naval Material Assurance and SUBSAFE). Perform compliant calibrations. Equipment must receive certified calibrations in accordance with AF 9000 and appropriate CFTOs/maintenance policies. Specifics include, but are not limited to:

1) Minimum of an annual calibration or as prescribed for each equipment or instrument.

2) Retain (or maintain access to) test reports, calibration certificates, calibration data and other records for audit or investigation purposes.[v]

3) Calibrations are to be performed by trained, competent personnel.[vi]

k. Technical Airworthiness. Any support equipment, measuring device, test equipment and test apparatus used in the performance of maintenance shall: [vii, viii]

1) Meet the specifications in the applicable maintenance manual of the approved maintenance program with respect to accuracy, considering the intended use;

2) Be calibrated in accordance with the calibration requirements published by the manufacturer of the measuring device, test equipment

and test apparatus, and accompanied by an acceptable calibration certificate or record;

3) Be calibrated by an organization who has a quality management system acceptable to the Technical Airworthiness Authority (TAA) and whose calibration procedures are traceable to a national standard; and

4) Be assessed, when the calibration certificate, record or report identifies that the measuring device, test equipment and/or test apparatus was found to be in an 'Out-of-Tolerance' condition. In such case, the organization shall determine if any aeronautical products are affected and take appropriate action.

l. Turnaround Time. Routine turnaround time for equipment calibrations within current limits (i.e. 10 days). Turnaround times for prioritized calibrations for operational requirements or surges (e.g. increased operational readiness) (i.e. three (3) days).

m. Responsiveness. Capable of responding to urgent operational requirements on a case-by-case basis with a turnaround time of less than three (3) days.

n. Deployment Support. Provide continuous support for mission essential functions for deployed operations either through the use of spares or direct support to deployed operations (e.g. reach-back ability to surge with priority turnaround).

o. On-site calibrations. Perform on-site calibrations for TMDE or instruments that cannot be moved or where is does not make economic sense to do so for a large variety of users throughout DND/CAF. This requirement implies the employment of trained, vetted and equipped local personnel or mobile calibration teams/services.

p. Affordability. The programme must stay within budget allocation and be flexible to account for budgetary constraints that may be applied on a periodic basis (e.g. budget pressures or changes in priorities during the fiscal year or from year to year).

q. ISO 10725 (*General Requirements for the Competence of Testing and Calibration Laboratories*). Comply with the various requirements within ISO 17025 (i.e. general, structural, resources, process and management system). Calibrations performed for the Calibration Programme must be conducted by competent laboratories and subject to verification in accordance with ISO 17025.

r. MIL-STD-45662A (*Calibration Systems Requirements*). Ensure compliance with Mil-Std-45662A to establish and maintain a system for the calibration of all TMDE used in fulfilment of contractual requirements (i.e. quality

assurance, accuracy of measurement standards, environmental controls, interval of calibrations, calibration procedures, out-of-tolerance conditions, adequacy of the calibration system, calibration sources, records, calibration status, control of subcontractor calibrations, storage and handling and amendments and revisions).

s. Management Information System. Manage an enterprise-level management information system (currently TEMMIS – Test Equipment Maintenance Management Information System) to coordinate and assist in the management of the Calibration Programme across DND/CAF.

t. Information Management. Defence Resource Management Information System (DRMIS). Ensure compliance with DND Enterprise Information Systems requirements. All authorized instruments that require calibration will need to be registered in DRMIS, where the process to manage the calibration of these instruments will be managed. TEMMIS will be decommissioned when its function is completely integrated into DRMIS and gaps addressed.

5 SUSTAINMENT CONCEPT

5.1 Sustainment Concept Overview

5.1.1 An overview of the Calibration Programme Sustainment Concept is shown at Figure 1.

5.1.2 The following themes are being developed and will be applied to the Calibration Programme overall and to the DND/CAF system-level operational requirements and programme goals identified above:

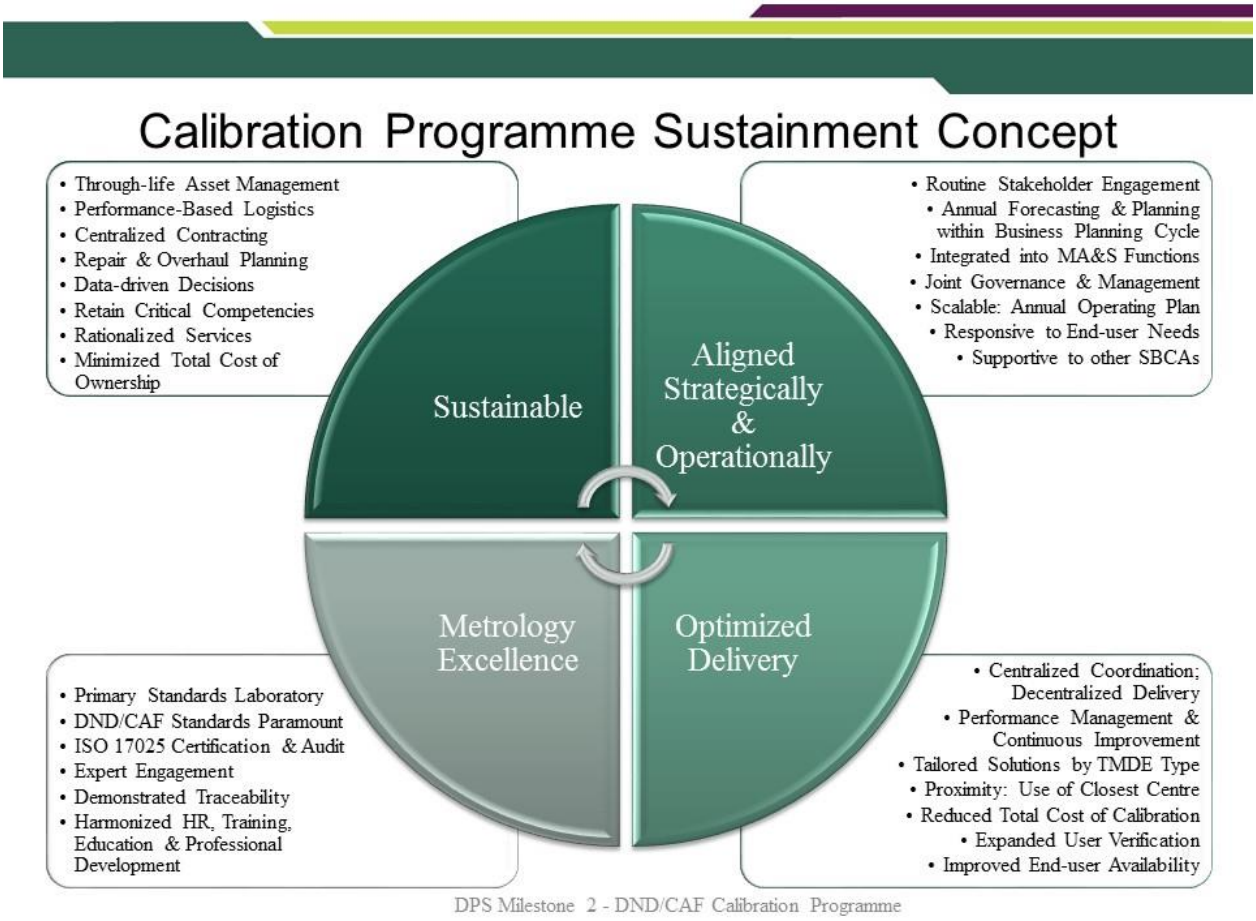
a. Theme 1 – Aligned Strategically and Operationally;

b. Theme 2 – Optimized Delivery;

c. Theme 3 – Metrology Excellence; and

d. Theme 4 – Sustainability.

Figure 1 - Calibration Programme Sustainment Concept



5.2 Division of Enterprise Scope

5.2.1 In-house Elements. The programme elements that are intended to remain in-house are:

a. Calibration Programme Office (QETE 5).

1) Continue formalizing: programme governance, stakeholder engagement and support, and a robust programme management function for all aspects of the Calibration Programme.

2) The TEMMIS management function within QETE 5-4 transitions to an overall programme coordination function.

3) The CAF General Purpose Test Equipment (GPTE) management function within QETE 5-4 transitions and develops the asset management function for TMDE that includes the major roles of acting as the Life Cycle Materiel Manager (LCMM) for common TMDE and

Standards used by DND/CAF, and the lead Technical Authority for TMDE.

4) The Primary Standards Laboratory within the QETE 5-2 continues to manage DND/CAF Standards.

5) Continue formalizing: metrology / measurement science expertise and engagement with external agencies including National Research Council of Canada, North Atlantic Treaty Organization and metrology bodies.

b. Government-Owned, Government Operated (GOGO) Calibration Centres. While the GOGO calibration centres are expected to remain for the foreseeable future, the nature of their calibration work and throughput at each centre will continue to evolve as the needs of DND/CAF evolve and as the business model for the Calibration Programme adjusts. Planned changes, recommended by the SBCA or driven by the results of other SBCAs and changes from internal stakeholders include:

1) Training personnel at Cold Lake to conduct calibrations for tip tanks and ejection seats, as they are co-located, thereby reducing the need for travel. After the transition, only Cold Lake will fulfill these calibrations for these legacy/unique items.

2) Transferring the task of calibrating Engine Test Facilities from the Calibration Programme to within scope of new commercial maintenance contracts being established by Director Air Engineering Project Management (Fighter and Trainers).

3) Allowing the verification, calibration and repair of torque instruments that are used in the Technical Airworthiness Program to be conducted at the most optimum calibration centre (i.e. decentralized) or within scope of the commercial contract, and seeking additional savings and efficiencies by expanding the verification concept on a (business) case-by-case basis throughout DND/CAF. The latter implies potentially purchasing new torque verifiers and training personnel at select units, and optimizing the delivery of calibrations and repairs of only the instruments that fail periodic verification. The Calibration Programme will continue to work with the MA&S planners in ADM(Mat) and the environments.

4) On-site calibrations for Esquimalt and Cold Lake will no longer be conducted on a regional basis. On-site calibrations in the western region will be included in the new commercial contract (i.e. same as currently conducted in the eastern region), allowing the two western calibration centres to focus on local on-site calibrations and the Contractor to develop and optimize an appropriate service delivery

model. This recommended approach is a balance between: maintaining in-house capability for locations with a large number of users with high-end needs; the minimization of travel, administrative burden and time away for in-house resources; and the opportunity for industry to optimize the delivery across Canada for calibrations that, in some cases, are very basic in nature (i.e. weigh scales with low operational impact). This approach allows for a smooth transition of the contract services and best positions the Calibration Programme to balance the four sustainment principles by potentially allowing managed growth of the commercial solution as deemed appropriate.

5) In addition to the on-site calibrations, many other calibrations are planned to shift from regional delivery to a support concept based on Proximity of Calibration for instruments not co-located with a GOGO calibration centre. Instead of sending TMDE to Esquimalt or Cold Lake, TMDE from across the region will be transferred to the contracted scope, in effect mirroring what is already in place in the eastern region.

6) All other legacy and/or centralized unique functions are planned to remain as they are under the current delivery model, at least for the interim period and the start of the new commercial contract. In these cases, there has been a substantial investment in capital equipment (e.g. standards), know-how and training, and service is generally optimized for the current user needs and GOGO calibration centre operations. The exact situation for each equipment type and function will be reviewed annually in step with the annual forecasting and business planning with the intent that deliberate transition plans will be implemented for any subsequent changes.

c. General Support. The specific nature of support provided by Base/Unit Calibration Coordinators, Unit Receiving and Dispatch, Base Transportation, and Base and Unit supply organizations that are related to the Calibration Programme will be reflected in updated policies in line with changes due to the DRMIS transition, the final parameters of the new commercial contract, touch points between in-house and commercial solutions, and the resulting overall service delivery model. It is expected that these aspects will continue to evolve, especially during the ramp-up period for the new contract.

5.2.2 Commercial Elements. The commercial sustainment will be a performance-based commercial service as identified in the Sustainment Business Case Analysis. An overview of commercial elements are not provided here to avoid any confusion with the contracted scope detailed elsewhere in this SOW.

5.3 Ongoing Transformation

5.3.1 Operationally, the Calibration Programme will transition from a regional-based system of five (5) GOGO calibration centres supplemented by two (2) commercial calibration centres to a consolidated programme supplemented by a single contract for national commercial calibration and repair services. The Calibration Programme will be centrally managed by the Calibration Programme Office at QETE, with decentralized programme delivery through the existing Primary Standards Laboratory co-located with QETE, a network of rationalized GOGO calibration centres across Canada and commercial services with decentralized calibrations optimized by proximity, turnaround time from the end-user's perspective and overall service delivery based on the goals of assuring high levels of quality and minimizing the total cost of ownership of TMDE.

5.3.2 The forecast for subsequent future years of the programme is intended to be determined through joint programme governance and through routine stakeholder engagements aligned with the business planning cycle, where future needs can be determined, operating plans adjusted and necessary aspects put into place for the coming year in a deliberate manner for both in-house and commercial aspects of the programme. Joint monitoring and management routine will be established to allow for performance to be managed, and issues addressed on a daily, monthly, quarterly, bi-annual and annual basis as appropriate, for both retained and contracted scope, with industry expected to participate as a partner.

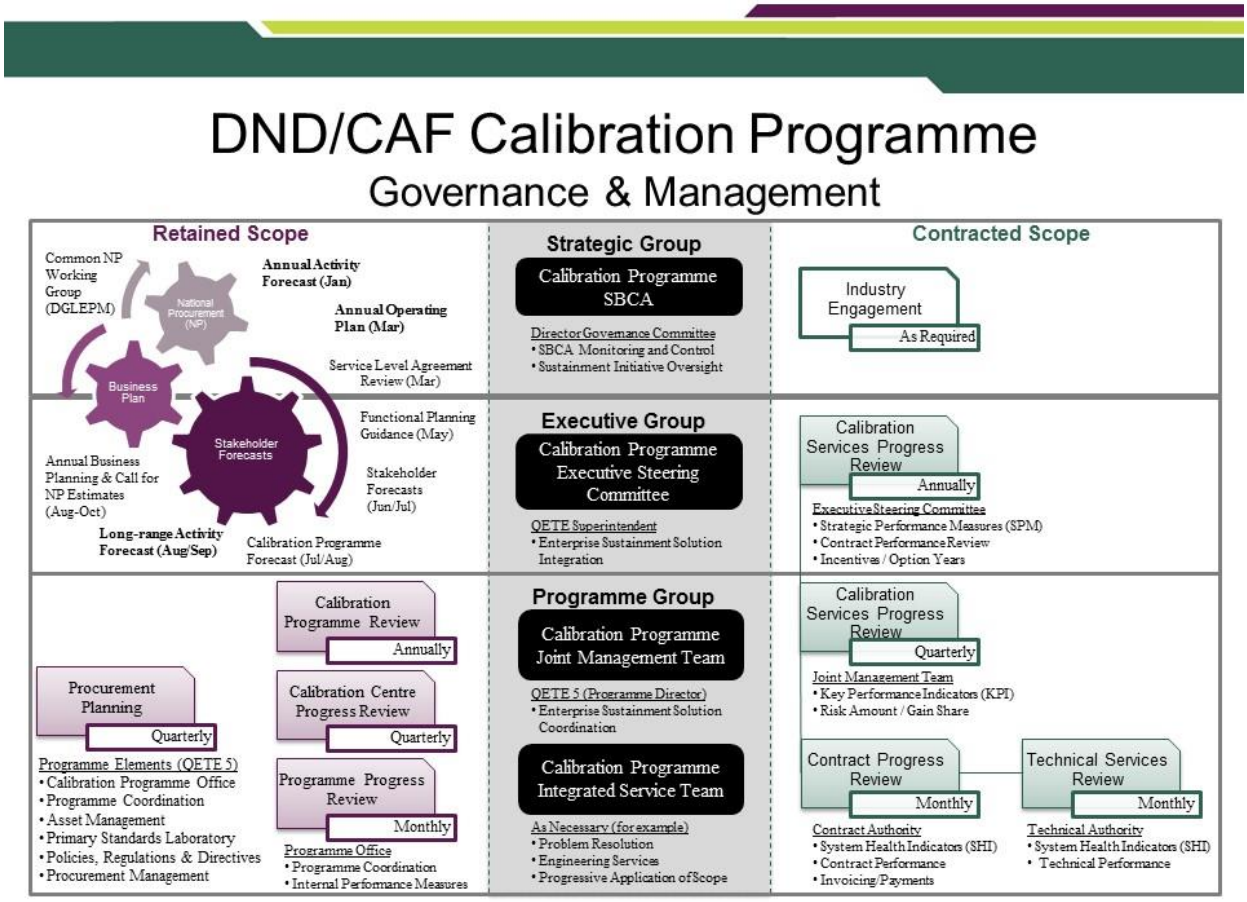
5.3.3 The main effort throughout the operation of the Calibration Programme will be to forecast future calibration needs while ensuring programme operations are aligned with and integrated into the broader MA&S function, departmental business plans and commercial services. The division of enterprise scope and programme delivery are expected to be adjusted as needed and evolve as each equipment type, classification or function is optimized and continuously improved over time.

6 Calibration Programme Governance and Management

6.1.1 As part of the transformation and the intent to establish joint governance and routine engagement with all stakeholders, a new DND/CAF Calibration Programme Governance and Management structure (Figure 2) is being established to provide oversight, assist in aligning the programme to other functions within the Department and conduct routine coordination for both the retained and contracted scope.

6.1.2 The specific meetings, membership and terms of reference will be developed and detailed where appropriate in this SOW and other Departmental regulations and instructions.

Figure 2 - DND/CAF Calibration Programme Governance and Management



ENDNOTES

[i] *International Vocabulary of Metrology – Basic Concepts and Associated Terms (VIM)*, Bureau international des pois et mesures, 3rd Edition, 2008, paragraph 2.41.
[ii] The property of the result of a measurement or the value of a standard whereby it can be related to stated references, usually national or international standards, through an unbroken chain of comparisons all having stated uncertainties. Traceability … applies to measurements / calibrations made from the prime system or subsystem through an unbroken chain of comparisons to the national reference standards. [MIL-HDBK-1839A, 27 Nov 2000].
[iii] **CALIBRATION** is an "operation that, under specified conditions, in a first step, establishes a relation between the quantity values with measurement standards and corresponding indications with associated measurement uncertainties and, in a second step, uses this information to establish a relation for obtaining a measurement result from an indication." *International Vocabulary of Metrology – Basic Concepts and Associated Terms (VIM)*, Bureau international des pois et mesures, 3rd Edition, 2008, paragraph 2.39.
[iv] ISO 17025:2017 para 6.5.
[v] ISO 17025:2017 para 7.8.
[vi] ISO 17025:2017 para 6.2.
[vii] DND, C-05-005-001/AG-001, Technical Airworthiness Manual (TAM), [Master Copy Available online: http://www.forces.gc.ca/en/business-regulations-technical-airworthiness/technical-airworthiness-manual.page], para 3.1.2.S2 Performance of Maintenance.
[viii] It is expected that the Land and Naval materiel assurance programmes will also evolve to having similar policies / requirements governing the calibration of TMDE and, in particular, mechanisms in place to address Out-of-Tolerance reporting as a matter of operational priority.