CLAS Requirements for Applications for CLAS Certification and SCC Accreditation for Calibration Laboratories

CLAS Requirements Document 1
July 2010

1.0 INTRODUCTION

Calibration laboratories wanting to become accredited must meet the requirements of published CLAS Requirements Documents and the general requirements outlined in the latest edition of the international standard ISO/IEC 17025 *General requirements for the competence of testing and calibration laboratories (CAN-P-4)*. Compliance with the requirements is verified by the Calibration Laboratory Assessment Service (CLAS) of the National Research Council of Canada (NRC) as part of the accreditation process of the Standards Council of Canada (SCC). Laboratories also must demonstrate competence to perform the specific measurements for which they wish to become accredited. Applicants must agree to comply with published CLAS requirements and with the SCC conditions for accreditation found in the latest edition of the PALCAN Handbook (CAN-P-1570).

Applicants should review CLAS Requirements Documents, the conditions of the PALCAN Handbook (CAN-P-1570) and the requirements of ISO 17025 (CAN-P-4). CLAS Technical Advisors are available to assist applicants in understanding the program requirements before an application is submitted.

2.0 APPLICATION PACKAGE

2.1 A new application for CLAS Certification and SCC Accreditation shall include:

- the signed application form – New Applicants (Appendix A);
- the completed Requested Scope of CLAS Certification and SCC Accreditation (Appendix D);

Note: please ensure sufficient technical information is provided in the requested scope to identify the types of instruments and/or standards being calibrated and the types of standards used; see example in Appendix E

- the completed CLAS 1510 Assessment Guide;
- the quality system manual with associated procedures; and
- non-refundable application fee, payable to the Receiver General for Canada.

2.2 Scope Extension requests shall include:

- the application form – Scope Extensions (Appendix B);

- the Requested Scope of CLAS Certification and SCC Accreditation detail the new parameters desired (Appendix D);

Note: please ensure sufficient technical information is provided in the requested scope to identify the types of instruments and/or standards being calibrated and the types of standards used; see example in Appendix E

2.3 Group Accreditation applications shall include:

- the signed application form – Group Accreditation (Appendix C);
- the completed Requested Scope of CLAS Certification and SCC Accreditation per location (Appendix D);

Note: please ensure sufficient technical information is provided in the requested scope to identify the types of instruments and/or standards being calibrated and the types of standards used; see example in Appendix E

- the completed CLAS 1510 Assessment Guide;
- management system manual with associated procedures; and
- non-refundable application fee, payable to the Receiver General for Canada (applicable only on the first application).

3.0 ADDITIONAL INFORMATION

To facilitate the technical assessment, a laboratory must always be prepared to provide the following supporting technical information (if applicable):
calibration procedures,
examples of completed calibration certificates (CLAS Requirements Document 6),
evidence of traceability (CLAS Requirements Document 9),
uncertainty budget(s) (CLAS Requirements Document 5),
control of measurement standards (CLAS Requirements Document 3),
available records of proficiency testing (CLAS Requirements Document 7).

All information provided to CLAS and SCC is confidential.

The information provided in this application has several purposes:

- to ensure that an applicant has examined each of the requirements and is reasonably confident of compliance with each one;
- to enable CLAS staff to detect and advise the applicant of any potential nonconformities, and thus provide better assurance of a successful on-site assessment;
- to provide the on-site assessment team with the information needed to carry out an effective assessment; and
- to provide the basis for confirming consistency between the documented and assessed capability of a laboratory.

If the applicant laboratory is part of a company or is a separate unit within an organization, the term "laboratory", refers only to the calibration laboratory for which accreditation is sought and not to the parent organization or other affiliations.

Appendix A: APPLICATION FORM
CLAS Certification and SCC Accreditation
New Applicants

Laboratory Legal Name: _____

Postal / Street Address: _____

City and Province or State: _____

Postal/Zip Code and Country: _____

hereby applies for CLAS Certification and SCC Accreditation as a calibration laboratory for the scope of measurement capabilities outlined in the attached Requested Scope of CLAS Certification and SCC Accreditation.

With this application, the applicant agrees to the following items by initialling the boxes:

☐ I agree to the use of FAX technology if required for assessment communication. Client FAX telephone number: (___) ___ - ____

☐ I agree to the use of EMAIL if required for assessment communication. Client EMAIL address: _____ @ _____

☐ This laboratory provides calibration services to all interested parties.

Laboratory Contact Person

NAME: _____

TITLE: _____

TELEPHONE: _____

Once CLAS Certification and SCC Accreditation is granted, the applicant agrees to the following obligation:

- to comply with the requirements and conditions contained in the latest edition of the CLAS Requirements Documents, and in the latest editions of the SCC documents: General Requirements for the Competence of Testing and Calibration Laboratories (CAN-P-4) and Program Requirements for Applicant and Accredited Laboratories (PALCAN Handbook CAN-P-1570);

- to pay the required fees to CLAS;

- to cooperate with CLAS and SCC in the scheduling of assessment visits. (this applies to all premises where calibrations take place);

- to provide access to information, documents and records as necessary for the assessment and maintenance of the accreditation

- to cooperate with CLAS and SCC in maintaining the integrity of the accreditation program;

- to claim accreditation only with respect to the scope for which it has been granted

- to notify CLAS, without delay, of any significant changes relevant to its accreditation, in any aspect of its status or operation relating to
  a) its legal, commercial, ownership or organizational status,
  b) the organization, top management and key personnel,
  c) main policies,
  d) resources and premises,
  e) scope of accreditation, and
  f) matters that may affect the ability of the CAB to fulfil requirements for accreditation; and

- that accreditation may be withdrawn, on failure of a laboratory to comply with the foregoing, subject only to the rights of appeal set out in the latest edition of the PALCAN Handbook.

Authorized Representative of Applicant Laboratory

SIGNATURE: _____

NAME: _____

TITLE: _____

DATE: _____

TELEPHONE: _____

Appendix B: APPLICATION FORM
CLAS Certification and SCC Accreditation
Scope Extensions

Laboratory Legal Name: _____

CLAS file number: _____

CLAS Certificate number: _____

hereby applies for an extension of the scope of measurement capabilities outlined in the attached Requested Scope of CLAS Certification and SCC Accreditation.

Authorized Representative of Applicant Laboratory

SIGNATURE: _____

NAME: _____

TITLE: _____

DATE: _____

TELEPHONE: _____

Laboratory Contact Person (if different than above)

NAME: _____

TITLE: _____

TELEPHONE: _____

Appendix C: APPLICATION FORM
CLAS Certification and SCC Accreditation
Group Accreditation

For details, please refer to CLAS Requirements Document 10.

Laboratory Legal Name: _____

Headquarters: _____

Postal / Street Address: _____

City and Province or State: _____

Postal/Zip Code and Country: _____

hereby applies for CLAS Certification and SCC Accreditation as a group for the locations and the scopes of measurement capabilities outlined in the attached Requested Scope of CLAS Certification and SCC Accreditation per location.

With this application, the applicant agrees to the following items by initialling the boxes:

☐ We agree to the use of FAX technology if required for assessment communication.

☐ We agree to the use of EMAIL if required for assessment communication.

☐ This laboratory provides calibration services to all interested parties.

Central Contact Person - Technical Operations

NAME: _____

TITLE: _____

TELEPHONE: _____ FAX: _____

EMAIL: _____

Central Contact Person – Management System

NAME: _____

TITLE: _____

TELEPHONE: _____ FAX: _____

EMAIL: _____

Central Contact Person - Billing

NAME: _____

TITLE: _____

TELEPHONE: _____ FAX: _____

EMAIL: _____

Locations:

Identification/Address	Telephone	Contact/Title

Once CLAS Certification and SCC Accreditation is granted, the applicant agrees to the following obligation:

- to comply with the requirements and conditions contained in the latest edition of the CLAS Requirements Documents, and in the latest editions of the SCC documents: General Requirements for the Competence of Testing and Calibration Laboratories (CAN-P-4) and Program Requirements for Applicant and Accredited Laboratories (PALCAN Handbook CAN-P-1570);

- to pay the required fees to CLAS;

- to cooperate with CLAS and SCC in the scheduling of assessment visits. (this applies to all premises where calibrations take place);

- to provide access to information, documents and records as necessary for the assessment and maintenance of the accreditation

- to cooperate with CLAS and SCC in maintaining the integrity of the accreditation program;

- to claim accreditation only with respect to the scope for which it has been granted

- to notify CLAS, without delay, of any significant changes relevant to its accreditation, in any aspect of its status or operation relating to
  g) its legal, commercial, ownership or organizational status,
  h) the organization, top management and key personnel,
  i) main policies,
  j) resources and premises,
  k) scope of accreditation, and
  l) matters that may affect the ability of the CAB to fulfil requirements for accreditation; and

- that accreditation may be withdrawn, on failure of a laboratory to comply with the foregoing, subject only to the rights of appeal set out in the latest edition of the PALCAN Handbook.

Authorized Representative of Group – Top Management

SIGNATURE: _____

NAME: _____

TITLE: _____

DATE: _____

TELEPHONE: _____

APPENDIX D: Requested Scope of CLAS Certification and SCC Accreditation

Laboratory Identification: _____

Quantity Measured or Type of Standard or Type of Equipment Calibrated	**Value or Range of Values**	**Calibration Measurement Capability* Expressed as Expanded Uncertainty**	**Location of Service (laboratory, on-site or mobile)**	**Procedure and/or Measurement Technique used Standard(s) and/or Equipment Providing Traceability**

* CMCs should be expressed at a level of confidence of approximately 95%

*** Calibration Measurement Capability** is defined in paragraph 4.0 of CLAS Requirements Document 1.

APPENDIX E: SAMPLE Requested Scope of CLAS Certification and SCC Accreditation

Quantity Measured or Type of Standard or Type of Equipment Calibrated	Value or Range of Values	Calibration Measurement Capability* Expressed as Expanded Uncertainty	Location of Service (laboratory, on-site or mobile)	Procedure and/or Measurement technique used Standard(s) and/or Equipment providing traceability
Spectrophotometers	0.1% to 100% spectral transmittance at decade wavelengths from 200 nm to 1100 nm	± 4% of reading	On-site	AAA spectral transmittance filter kit calibrated every 3 years by NIST and compared in-house against check standards at least monthly.
Luminance meters	0.01 cd/m2 to 299,000 cd/m2	± 5% of reading for CIE Source A	Laboratory facility	CIE Source A 200 W luminous intensity standard and Ba2SO4 reflectance standard on custom optical bench; all 3 are calibrated by NRC, either directly or through suitable transfer standards. Lamp current is measured using a AAA digital voltmeter across a BBB current shunt, both of which are calibrated every 2 years by LLL (CLAS cert. No. nnn).
Voltage, dc	10 V	2.0 ppm for calibration of solid state reference standards	Lab	Bank of CCC voltage standards, one of which is calibrated annually by AAA (CLAS cert. No. nnn). The 4 voltage standards are inter-compared at least monthly using a DDD digital multimeter calibrated annually by AAA (NVLAP Lab Code BBB)
Current ac	100 µA to 1 A; 45 Hz to 100 Hz	0.09% to 0.12%	Lab	AAA multifunction calibrator monitored with a BBB digital multimeter that is calibrated annually by XXX (A2LA accreditation no. nn).
Current ac	1 A to 100 A; 45 Hz to 100 Hz	0.04% to 0.08%	Lab	AAA digital multimeter that is calibrated annually by XXX (NVLAP Lab Code nnn) and BBB current shunts calibrated annually by NIST.
Frequency	1 MHz to 10 MHz	± 1 part in 108	Lab	XXX frequency counter calibrated annually by AAA (NATA Accreditation No. nnn)

Quantity Measured or Type of Standard or Type of Equipment Calibrated	Value or Range of Values	Calibration Measurement Capability* Expressed as Expanded Uncertainty	Location of Service (laboratory, on-site or mobile)	Procedure and/or Measurement technique used Standard(s) and/or Equipment providing traceability
Frequency	5 MHz and 10 MHz	± 1 part in 1011 for calibration of suitably stable oscillators	Lab	AAA disciplined GPS receiver that is continually monitored using an internally-characterised BBB phase comparator and a CCC Rubidium oscillator that is calibrated at least every 2 years by intercomparison with NRC
Time interval	5 s to 24 h	± 0.2 s	On-site and Lab	XXX manually-operated digital timer calibrated remotely by measurement of time signal distributed by NRC by telephone.
Rotational speed	1 rpm to 75,000 rpm	± 1 rpm	On-site	AAA optical tachometer calibrated annually by NRC.
Liquid in glass thermometer	-20°C to +70°C	± 0.5 °C	Lab	Stirred, characterised, water and oil baths and XXX digital thermometer calibrated annually by YYY (CLAS cert. No. nnn).
Temperature indicators for Type K thermocouples	0°C to 1000°C	± 0.3 °C to 1.1 °C by electrical simulation	On-site and mobile	AAA multifunction calibrator calibrated annually by BBB (JAB accreditation no. nnn). The following widely reviewed and authoritative publication is used for the specification of typical TC responsivity: CCC.
Gauge block, length: Steel, Rectangular and Square	Metric, 125 to 500 mm	± (0.068 + 0.0011L) µm (Note: L in 'millimetre')	Lab	
Pressure, indicators and gauges: (gauge pressure)	10 to 800 psi	0.08 % of reading or 0.04 psi whichever greater	Lab and on-site	

* BMCs should be expressed at a level of confidence of approximately 95%

APPENDIX F: CALIBRATION MEASUREMENT CAPABILITY

The “calibration measurement capability” is the smallest uncertainty of measurement that a laboratory can achieve within its scope of accreditation, when performing more or less routine calibrations of nearly ideal measurement standards. These ideal measurement standards are intended to define, realize, conserve or reproduce a unit of that quantity, or one or more of its values, or when performing more or less routine calibrations of nearly ideal measuring instruments.

'More or less routine calibrations' means that a laboratory shall be able to achieve the stated capability in the normal work that it performs under its accreditation. There are instances when a laboratory is able to achieve better results through extensive investigations and additional precautions. However, these cases are not covered by the definition of calibration measurement capability, unless it is the stated policy of a laboratory to perform such scientific investigations. If this is the case they become the 'more or less routine' type calibrations of a laboratory. Note: To further clarify the definition of a “nearly ideal” device, CLAS requires that the device is one that a laboratory is equipped to calibrate. In other words, the calibration measurement capability refers to a laboratory’s uncertainty in calibrating the best available device that it can measure using the best techniques that it normally uses.

Inclusion of the qualifier 'nearly ideal' in the above definition means that calibration measurement capability should not be dependent on the characteristics of the device to be calibrated. Inherent in the concept of being nearly ideal is that there should be no significant contribution to the uncertainty of measurement attributable to physical effects that can be ascribed to imperfections of the device to be calibrated. However if it is established that even the most 'ideal' available device contributes to the uncertainty of measurement, this contribution shall be included in the determination of the calibration measurement capability and a statement should be made that the calibration measurement capability refers to the calibration of that type of device.

The definition of calibration measurement capability implies that within its accreditation a laboratory is not entitled to claim a smaller uncertainty of measurement than the calibration measurement capability. This means that a laboratory is required to state a larger uncertainty than that corresponding to the calibration measurement capability whenever it is established that the actual calibration process adds significantly to the uncertainty of measurement. Typically the equipment under calibration may give a contribution. The reported uncertainty of measurement can never be smaller than the calibration measurement capability.

All components which contribute significantly to the uncertainty of measurement shall be taken into account when evaluating the calibration measurement capability. The evaluation of the contributions that are known to vary with time or with any other physical quantity can be based on limits of possible variations assumed to occur under normal working conditions. For instance, if the used working standard is known to drift, the contribution caused by the drift between subsequent calibrations of the standard has to be taken into account when estimating the uncertainty contribution of the working standard.

In some fields the uncertainty of measurement may depend on some additional parameter, e.g., frequency of applied voltage when calibrating standard resistors. Such additional parameters shall be stated together with the physical quantity in question and the calibration measurement capability specified for the additional parameters. This can often be done by giving the calibration measurement capability as a function of these parameters.

The BMC when expressed as a single value must be achievable across the entire range indicated.

Note: The above “calibration measurement capability” definition is based on the following document: Expression of the Uncertainty in Measurement, EA (European co-operation for Accreditation) document EA-4/02.

APPENDIX G: MEASUREMENT CAPABILITY CATEGORIES

Major fields of calibration		Categories of calibration capabilities of calibration capabilities
Major fields of calibration		**Categories of calibration capabilities**
1 Accoustic and vibration	1-1	Microphones
	1-2	Sound level meters
	1-3	Accoustic calibrators
	1-4	Accelerometers
	1-5	Others
2 Chemical	2-1	Reference materials
	2-2	Instrumentation
	2-3	Others
3 Dimensional	3-1	1D dimensional measuring equipment
	3-2	2D dimensional measuring equipment
	3-3	3D dimensional measuring equipment
	3-4	Gauge blocks
	3-5	Dimensional standards and gauges (other than gauge blocks)
	3-6	Thread gauges
	3-7	Thread measuring equipment
	3-8	Speed measuring equipment
	3-9	Others
4 Electrical	4-1	Voltage DC
	4-2	Voltage AC
	4-3	High Voltage (greater then 2 KV)
	4-4	Voltage AC/DC transfer
	4-5	Resistance
	4-6	High resistance (greater than 1 Gohm)
	4-7	Resistance ratio
	4-8	Current DC
	4-9	Current AC
	4-10	Current AC/DC transfer
	4-11	Electrical power AC/DC
	4-12	Current transformer (including current clamp meters)
	4-13	Potential transformer
	4-14	Inductance
	4-15	Capacitance
	4-16	Magnetic properties
	4-17	Electrical temperature simulation
	4-18	Magnetix flux
	4-19	RF Power
	4-20	Attenuation
	4-21	Phase
	4-22	Others

5	**Force**	5-1	Standard (eg. load cell)
		5-2	Force measuring equipment
		5-3	Torque standards
		5-4	Torque measuring equipment
		5-5	Others
6	**Flow**	6-1	Fluid
		6-2	Gas
		6-3	Viscosity
		6-4	Others
7	**Hardness**	7-1	Standards (hardness blocks)
		7-2	Hardness testers indirect verification
		7-3	Hardness testers full verification
		7-4	Others
8	**Humidity**	8-1	Humidity generator
		8-2	Humidity measuring equipment
		8-3	Others
9	**Mass**	9-1	Mass standards (nominal weights)
		9-2	Mass standards (non-nominal weights)
		9-3	Balances and scales
		9-4	Density
		9-5	Gravity
		9-6	Others
10	**Photometry and Radiometry**	10-1	Photometry
		10-2	Spectrophotometry
		10-3	Colorimetry
		10-4	Radiometry
		10-5	Others
11	**Pressure**	11-1	Deadweight tester (hydraulic and pneumatic)
		11-2	Pressure measuring equipment
		11-3	Vacuum measuring equipment
		11-4	Others
12	**Radiological (including Ionizing Radiation)**	12-1	Dosimetry
		12-2	Neutron measurement
		12-3	Radioactivity
		12-4	Others

13	**Thermometry**	13-1	Fixed point cells
		13-2	SPRTs
		13-3	Temperature measuring equipment (other than SPRT)
		13-4	Thermal radiation measuring equipment
		13-5	Temperature controlled enclosures
		13-6	Others
14	**Time and Frequency**	14-1	Frequency / Period
		14-2	Time dissemination
		14-3	Rise time and pulse characteristics
		14-4	Time interval
		14-5	Rotational speed
		14-6	Others
15	**Volume**	15-1	Volume delivering equipment (e.g., Pipette)
		15-2	Volume containing equipment
		15-3	Others