



CSIR–NPL India Certification Scheme (NPLI CS)

For Air Pollution Monitoring Equipment



CSIR–National Physical Laboratory

(www.nplindia.in)

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CSIR-National Physical Laboratory

The CSIR-National Physical Laboratory is the National Metrology Institute (NMI) of India and it is bestowed with the responsibility of providing apex level international traceability to measurements by the act of Indian Parliament. CSIR-NPL is also a member of Bureau International des Poids et Mesures (BIPM) and signatory to the International Committee for Weights and Measures - Mutual Recognition Arrangement (CIPM-MRA). Currently, CSIR-NPL provides apex level calibration of equipment to various industries, strategic, academia and government agencies. Such calibrations at CSIR-NPL are keys to drive the growth engine of industries and assume greater significance for the success of "Make in India".

Vision and Mission

"Accurate and precise measurement are essential to drive the growth engines of Indian Science & Industry as it removes chaos and prompts innovations, which in turn, would save precious lives, resources and time". The mission of the CSIR-NPL are :

- a. *Developing India's measurement standards that are internationally accepted and disseminating the measurement capabilities to industry, government, strategic and academia that underpin the India's prosperity and quality of life.*
- b. *Conducting multidisciplinary R&D with a mission to establish the futuristic quantum standards and upcoming technologies so that India remains on par with international measurement laboratories.*
- c. *Developing sophisticated analytical equipments (i.e. import substitutes) under "make in India" programme to cater the ever increasing demands of emerging India.*
- d. *Training of young scientists and industry personnel in the area of measurements under "Skill India" programme.*

Mandate

CSIR-National Physical Laboratory (NPL-India) is mandated to be India's "National Measurement Institute" (NMI) by the act of Parliament and is the custodian of "National Standards" with a responsibility of the dissemination of measurements to the needs of the Country.

MESSAGE

SECRETARY OF ENVIRONMENT, FOREST & CLIMATE CHANGE

Rapidly expanding economy and migration of people to urban centres in India is a significant factor for the deterioration of ambient air quality, particularly in metropolitan areas in the country. The Government has been actively involved in improving air quality through several steps including notification of National Ambient Air Quality Standards; setting up of monitoring network for assessment of ambient air quality; launching the National Air Quality Index; notification of Construction and Demolition Waste Management Rules; banning of burning of biomass; promotion of public transport network; and launching the National Clean Air Programme (NCAP) in 2019.

Ministry has collaborated with the Council of Scientific and Industrial Research - National Physical Laboratory (CSIR-NPL) for establishment of state-of-the-art facility for testing, calibration, and certification of Online Continuous Emission Monitoring System (OCEMS) and Continuous Ambient Air Quality Monitoring System (CAAQMS). NPL has been recognized as 'National Certification Agency for Air Pollution Monitoring Equipment'.

It is my firm belief that the importance of regulations, policies, and investments in improving air quality can be strengthened by successful integration of technology, innovation and engineering. While developing and implementing technologies, it is of paramount importance that the technology suits the Indian scenario in terms of short and long term ecological and environment concerns, social infrastructure, cultural ethos, and characteristics of the economy.

I would like to congratulate the team members who have given their sincere contribution in establishing the monitoring and testing facilities for air quality in India. I wish all the success to the NPL-CSIR in this endeavour.

(RP Gupta)

शिव दास मीना, भा.प्र.से.
अध्यक्ष
Shiv Das Meena, I. A. S.
Chairman



केन्द्रीय प्रदूषण नियंत्रण बोर्ड
पर्यावरण, वन एवं जलवायु परिवर्तन मंत्रालय, भारत सरकार
CENTRAL POLLUTION CONTROL BOARD
MINISTRY OF ENVIRONMENT, FOREST & CLIMATE CHANGE, GOVT. OF INDIA

MESSAGE

It gives me immense pleasure in congratulating the National Physical Laboratory (National Metrology Institute of India) on the auspicious occasion of its 75th foundation day. I am glad that CSIR - NPL is launching the long awaited Indian Certification System for air quality monitoring instruments and equipments.

This Endeavour is a result of technical collaboration between Central Pollution Control Board (CPCB) and CSIR-NPL with financial assistance from Ministry of Environment, Forest & Climate Change (MoEF&CC). This partnership between India's apex environmental regulatory body (CPCB) and CSIR-NPL with technical assistance of NPL-UK shall not only ensure data quality objectives in air quality monitoring but strengthen the country's motto of self-reliance by having first ever product certification system for environmental monitoring instruments and equipments in South East Asia.

My felicitations to team CSIR-NPL for achieving this feat and best wishes for their future endeavours in strengthening environmental research through such collaborations.


(Shiv Das Meena)

Delhi : 31st December, 2020.



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FOREWORD

CSIR-National Physical Laboratory (CSIR-NPL) being a National Metrology Laboratory always stands with its capabilities to serve the national requirements through its standards to establish the unbroken chain of measurement traceability to the SI units. CSIR-NPL is continuously working to expand its capabilities by adding new measurement facilities to support the **"National Self Reliant Mission"**. Development of "CSIR National Physical Laboratory India Certification Scheme (NPLI CS)" to certify the air pollution monitoring equipment is another step in this direction through which it will ascertain the reliability of data monitored with the help of various manual and automated pollution monitoring systems. The performance of instruments and their calibrations are the major issues that need to be addressed. Most of the instruments used in India are usually imported from abroad which come with certifications from agencies like USEPA, TUV, MCERTs etc. These certificates are issued based on the environmental conditions of the certificate issuing country which are very different from the environmental conditions prevalent in India. This affects the quality of measurements by the instrument operating for a long time in the Indian conditions and warrants a revisit of the certification process at regular intervals. For controlling and abating the environmental pollution, Ministry of Environment, Forest & Climate Change (MoEF&CC) in exercise of the powers conferred by section 3 of the Environment (Protection) Act, 1986 (29 of 1986) has designated the **"Council of Scientific and Industrial Research - National Physical Laboratory (CSIR-NPL) as national verification agency for certifying instruments and equipments for monitoring emissions and ambient air"** through its gazette notification no. 2758 dated August 22, 2019.



To meet this requirement, CSIR-NPL has developed the **"CSIR-NPL India Certificate Scheme (NPLI CS)"** to provide certification of performance evaluation of air pollution monitoring equipment. To support the NPLI CS framework, CSIR-NPL is establishing test facilities for air pollution monitoring equipment. The NPLI CS will facilitate indigenous manufacturers to demonstrate the quality of their equipment and compete in national and international markets.

Dr. D. K. Aswal

Director

CSIR-National Physical Laboratory

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भारत का राजपत्र
The Gazette of India

The Legal Metrology (National Standards) Rules, 2011

NOTIFICATION

(d) "General Conference on Weights and Measures" means the conference General des Poids et Mesures established under the Metre Convention to which India acceded in 1957;

CHAPTER III
NATIONAL STANDARDS

23. Custody, maintenance, etc. of national standards of weights and measures.- (1) The work relating to the realisation, establishment, custody, maintenance, determination, reproduction and updating of national standards of weights and measures shall, on the commencement of these rules, be the responsibility of the National Physical Laboratory.

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अधिसूचना

नई दिल्ली, 22 अगस्त, 2019

का.आ. 3023(अ).—पर्यावरण के संरक्षण तथा इसकी गुणवत्ता में सुधार लाने और पर्यावरणीय प्रदूषण के निवारण, नियंत्रण एवं उपशमन को ध्यान में रखते हुए वायु गुणवत्ता की निगरानी के यंत्रों तथा उपस्करों के प्रमाणन संबंधी उपाय किए जाने की आवश्यकता है।

अतः, अब, केंद्रीय सरकार पर्यावरण (संरक्षण) अधिनियम, 1986 (1986 का 29) की धारा 3 द्वारा प्रदत्त शक्तियों का प्रयोग करते हुए, वैज्ञानिक एवं औद्योगिक अनुसंधान परिषद-राष्ट्रीय भौतिक प्रयोगशाला (सीएसआइआर-एनपीएल) को उत्सर्जनों तथा परिवेशी वायु की निगरानी के लिए यंत्रों तथा उपस्करों के प्रमाणन हेतु राष्ट्रीय सत्यापन एजेंसी के रूप में नामनिर्दिष्ट करती है।

2. सीएसआइआर-एनपीएल द्वारा निरंतर उत्सर्जन निगरानी प्रणालियों (सीईएमएस) के अतिरिक्त हस्तचालित सांचों तथा निरंतर परिवेशी वायु गुणवत्ता निगरानी केंद्रों (सीएन्यूएमएस), दोनों के लिए आइएसओ 17605 और आइएसओ 17025 जैसे अंतरराष्ट्रीय मानकों के अनुपालन में आवश्यक अवसंरचना, प्रबंधन प्रणाली और परीक्षण तथा प्रमाणन सुविधाएं विकसित की जाएंगी और सीएसआइआर-एनपीएल, केंद्रीय प्रदूषण नियंत्रण बोर्ड के परामर्श से मापनों के लिए सभी प्रलेखन तथा प्रोटोकॉल की तैयारी के लिए भी उत्तरदायी होगी।

[फा. सं. क्यू-16017/72/2018-सीपीए]

निधि खरे, संयुक्त सचिव

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THE GAZETTE OF INDIA : EXTRAORDINARY

[PART II—SEC. 3(ii)]

MINISTRY ON ENVIRONMENT, FOREST AND CLIMATE CHANGE

NOTIFICATION

New Delhi, the 22nd August, 2019

S.O. 3023(E).—Whereas, with a view to protecting and improving the quality of environment and preventing, controlling and abating environmental pollution, there is a need to take measures relating to certifying instruments and equipments for monitoring air quality.

Now, therefore, in exercise of the powers conferred by section 3 of the Environment (Protection) Act, 1986 (29 of 1986), the Central Government here by designates the Council of Scientific and Industrial Research - National Physical Laboratory (CSIR-NPL) as national verification agency for certifying instruments and equipments for monitoring emissions and ambient air.

2. CSIR-NPL shall develop necessary infrastructure, management system, testing and certification facilities conforming to international standards like ISO 17605 and ISO 17025 for both manual samplers and Continuous Ambient Air Quality Monitoring Stations (CAQMS) in addition to Continuous Emission Monitoring Systems (CEMS) and CSIR-NPL shall also be responsible for preparation of all documentation and protocol for measurements, in consultation with the Central Pollution Control Board.

[F. No. Q-16017/72/2018-CPA]

NIDHI KHARE, Jt. Secy.

1. Normative References

The following reference documents are indispensable for the application of this document.

- i. **ISO-17025** : General requirements for the competence of testing and calibration laboratories
- ii. **ISO-17021** : Conformity assessment - Requirements for bodies providing audit and certification of management systems
- iii. **ISO-17065** : General requirements for the competence of Certification body
- iv. **ISO-9001** : Quality management systems - Requirements
- v. **EN 14211 (or Indian equivalent)** : Ambient air quality - Standard method for the measurement of the concentration of nitrogen dioxide and nitrogen monoxide by chemiluminescence.
- vi. **EN 14212 (or Indian equivalent)** : Ambient air quality - Standard method for the measurement of the concentration of sulphur dioxide by ultraviolet fluorescence
- vii. **EN 14625 (or Indian equivalent)** : Ambient air quality - Standard method for the measurement of the concentration of ozone by ultraviolet photometry
- viii. **EN 14626 (or Indian equivalent)** : Ambient air quality - Standard method for the measurement of the concentration of carbon monoxide by non dispersive infrared spectroscopy
- ix. **EN 14662-3 (or Indian equivalent)** : Ambient air quality - Standard method for measurement of benzene concentrations - Part 3: Automated pumped sampling with in situ gas chromatography
- x. **EN 15267-2 (or Indian equivalent)** : Air quality - Certification of automated measuring systems - Part 2: Initial assessment of the AMS manufacturer's quality management system and post certification surveillance for the manufacturing process
- xi. **EN 15267-3 (or Indian equivalent)** : Air quality - Certification of automated measuring systems - Part 3: Performance criteria and test procedures for automated measuring systems for monitoring emissions from stationary sources
- xii. **EN 15267-1 (or Indian equivalent)** : General requirements for bodies operating product certification systems

2. Background

In the field of environmental monitoring, the data quality is posing a major challenge as the reliability of such measurements needs to be ascertained. The roles of instrument and the calibration are the major issues that need to be addressed. While most of the instrument used are usually imported from abroad which comes with certifications from agencies like USEPA, TUV, MCERTS etc. These certificates are issued based on the environmental conditions of the certificate issuing country which are different from the environmental conditions prevalent in India e.g. high variability in temperature and humidity during different seasons and different geographical regions. This affects the quality of measurements by the instrument operating for a long time in the Indian conditions and warrants a revisit of the certification process at regular intervals. However, as of now, no certification system is available in India for environmental monitoring equipment. The traceability of measurement is also an integral part of generation of reliable data. A measurement is valid only if the traceability to SI units is established and the uncertainties in each measurement are estimated.

CSIR-National Physical Laboratory is the National Metrology Institute (NMI) of India. It is a member of Bureau International des Poids et Mesures (BIPM) and signatory to the International Committee for Weights and Measures - Mutual Recognition Arrangement (CIPM-MRA). The NMIs demonstrate the international equivalence of their measurements through CIPM-MRA.

In view of above, CSIR-NPL has developed NPL-India Certification Scheme (NPLI CS) to cater to the country's needs in respect of certification of air pollution monitoring equipment and intends to initiate the certification process for equipments like 'Online Continuous Emission Monitoring System (OCEMS)', 'Continuous Ambient Air Quality Monitoring System (CAAQMS)' and 'PM_{2.5}/PM₁₀ samplers'.

The scheme will provide a complete and cost effective solution for test, calibration and certification to the Indian as well as foreign manufacturers of these equipment/systems. Due to a signatory to the CIPM-MRA, the certificates issued by CSIR-NPL will be acceptable world-wide. This will help manufacturers of these equipment to trade in international market as well besides helping in 'Make in India' program.

3. Objectives

- 3.1 To develop scheme structure and certification scheme rules for OCEMS, CAAQMS & PM_{2.5}, PM₁₀
- 3.2 To define operational elements of scheme.
- 3.3 To define requirements for CSIR-NPL as certification body as per ISO 17065.

- 3.4 To define mechanism of testing for three classes of instrument[#] *i.e.*
 - 3.4.1 Instruments with previous certification
 - 3.4.2 New instruments from manufacturers likely to get Indian testing
 - 3.4.3 Indian manufactures or international manufactures intended specifically for India.
- 3.5 The proposed scheme covers a scheme structure that will be able to address instrument/ system product certification for OCEMS, CAAQMS, PM_{2.5}, PM₁₀ and Data Acquisition & Handling System (DAHS).

4. Scope

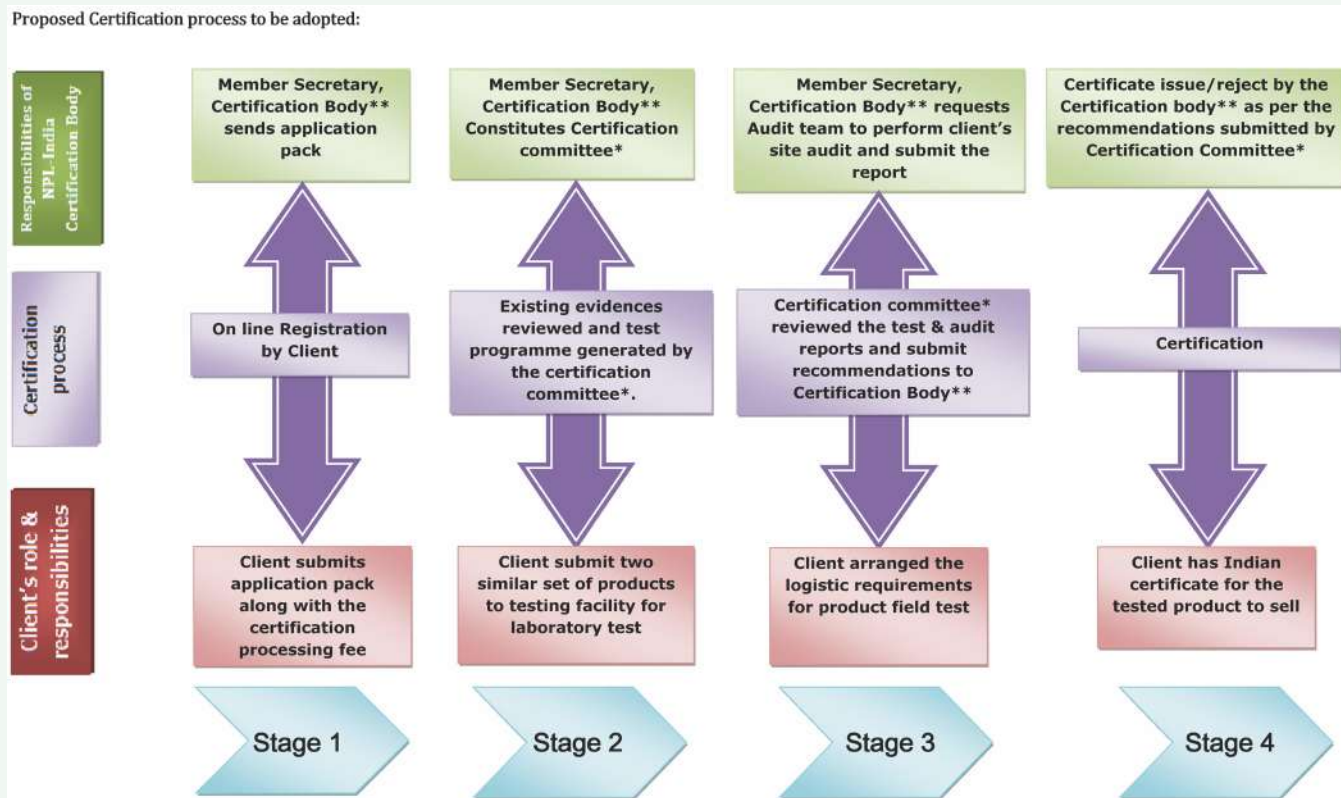
- 4.1 Develop scheme structure, rules and organisational elements
- 4.2 Develop performance specification for OCEMS, CAAQMS, PM_{2.5} & PM₁₀ instruments
- 4.3 Define test conditions, and ranges of influence quantities
- 4.4 Define test programme, test protocols and performance requirements for the test systems uncertainty requirements for the test conditions
- 4.5 Develop manufacturer audit specifications, aligned with international norms/ standards

5. Certification Scheme and Structure

CSIR-National Physical Laboratory being national measurement institute and signatory of CIPM-MRA (International Committee for Weights and Measures- Mutual Recognition Arrangement) is authorized to issue product certificate for trade across the international borders with quality and minimal disruption. The proposed certification scheme will bound the national/ international manufacturers of environmental automated measuring systems to get their instruments/technologies certified from certification body before deploying in India. Periodic testing of the approved products will also be executed by the proposed Certification Body to ensure compliance to the standards. The proposed certification mechanism will be a four stage simplified scheme as shown in figure 1.

To implement the proposed four stage certification system a well defined structure must be in place with a defined role and responsibilities as per the requirements of ISO-17025, ISO-17065 and other equivalent international norms/standards. The proposed structure includes

[#] To be finalised as per the regulatory body's requirements.



* The certification committee comprises members from CSIR-NPL test facility, CPCB, CSIR-NEERI, Three co-opted external members from relevant field. The committee will works under the Chairmanship of Head, ESBMD, CSIR-NPL

** The Certification Body comprises of members from CSIR-NPL, CSIR-NEERI & CPCB along with a Member Secretary. The Board will works under the Chairmanship of Director, CSIR- NPL

Figure 1: NPL-India Certification Scheme

four major components i.e. 1) NPL-India Certification Body (NICB), 2) Certification Committee, 3) Testing and Calibration facility and 4) Audit Committee. The composition along with the role and responsibilities of each part has been elaborated in the flow diagram as shown in figure 2.

Figure 2 shows the flow diagram and provides the complete solution from submission of the application to issue of product certificate. The details of each component along their role and responsibilities are described below.

5.1 NPL-India Certification Body (NICB)

The NPL-India Certification Body (NICB) will be three members decision making committee comprising of Director, CSIR-NPL; Member Secretary, CPCB and Director, CSIR-

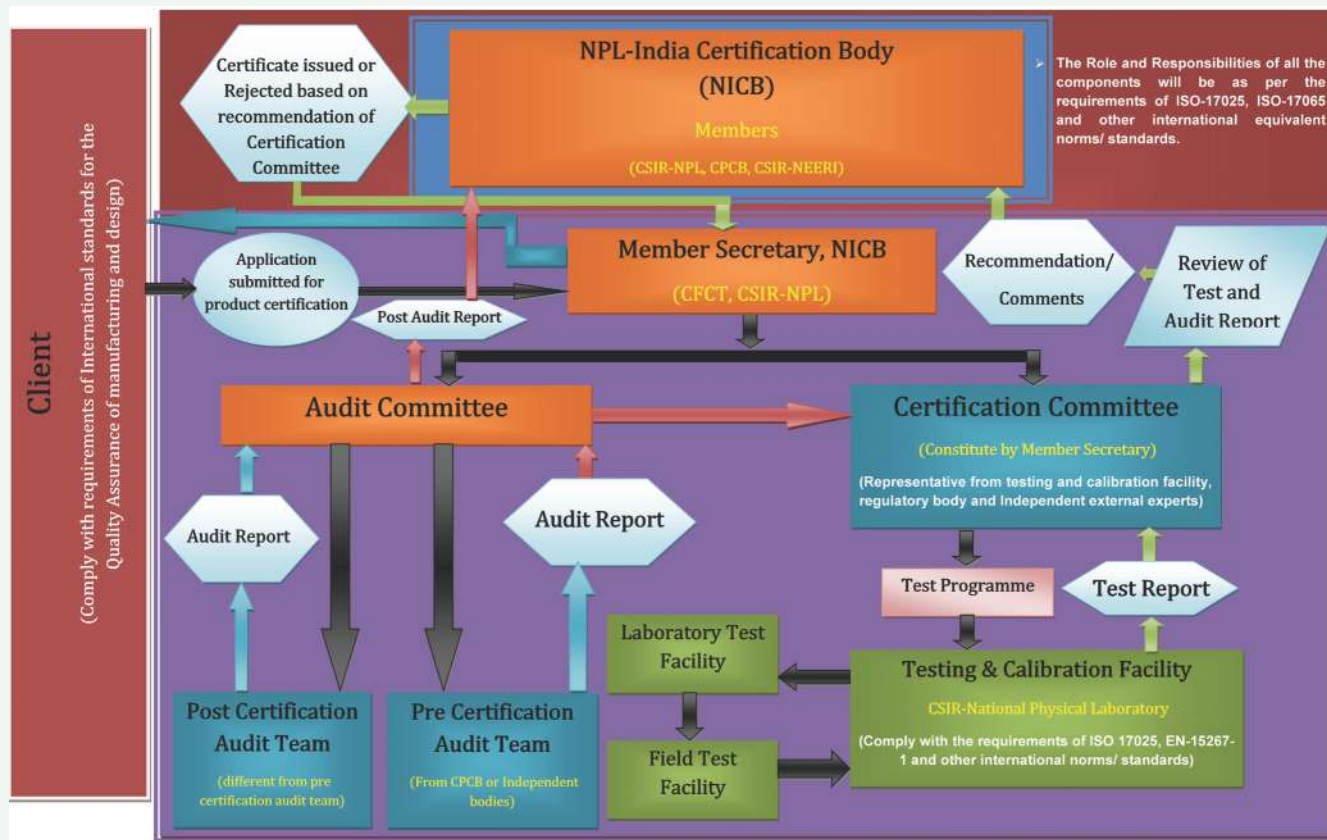


Figure 2: The structure along with the role and responsibilities of proposed certification system

NEERI. The meetings of NICB will be coordinated by Member Secretary of NPLI CS. The role and responsibilities of NICB will be in accordance with the requirement of ISO-17065, such as legal stature (certification agreement with the client to use of certification mark/licences etc.), confidentiality and impartiality. The NICB will follow the requirements as mentioned in section-7 of ISO-17065 to monitor the various steps of the certification process. This includes receiving and reviewing of applications, ensuring the product, process, or appropriately evaluation of service, and persons independent of the evaluation review to make a final decision upon whether or not all certification requirements have been met. In accordance with the section-7 of ISO-17065, the NICB will also be empowered for suspending or withdrawing certification in case of receiving valid complaint(s) or appeal(s) from users.

The proposed certification scheme will also empower the member secretary, NPLI CS (i.e. Head-CFCT, CSIR-NPL) to constitute product specific certification committee and also request Quality Manager of CSIR-NPL for constitution of the audit team with approval of NICB. The flow diagram shown in figure 3 summarizes the role and responsibilities of NICB.

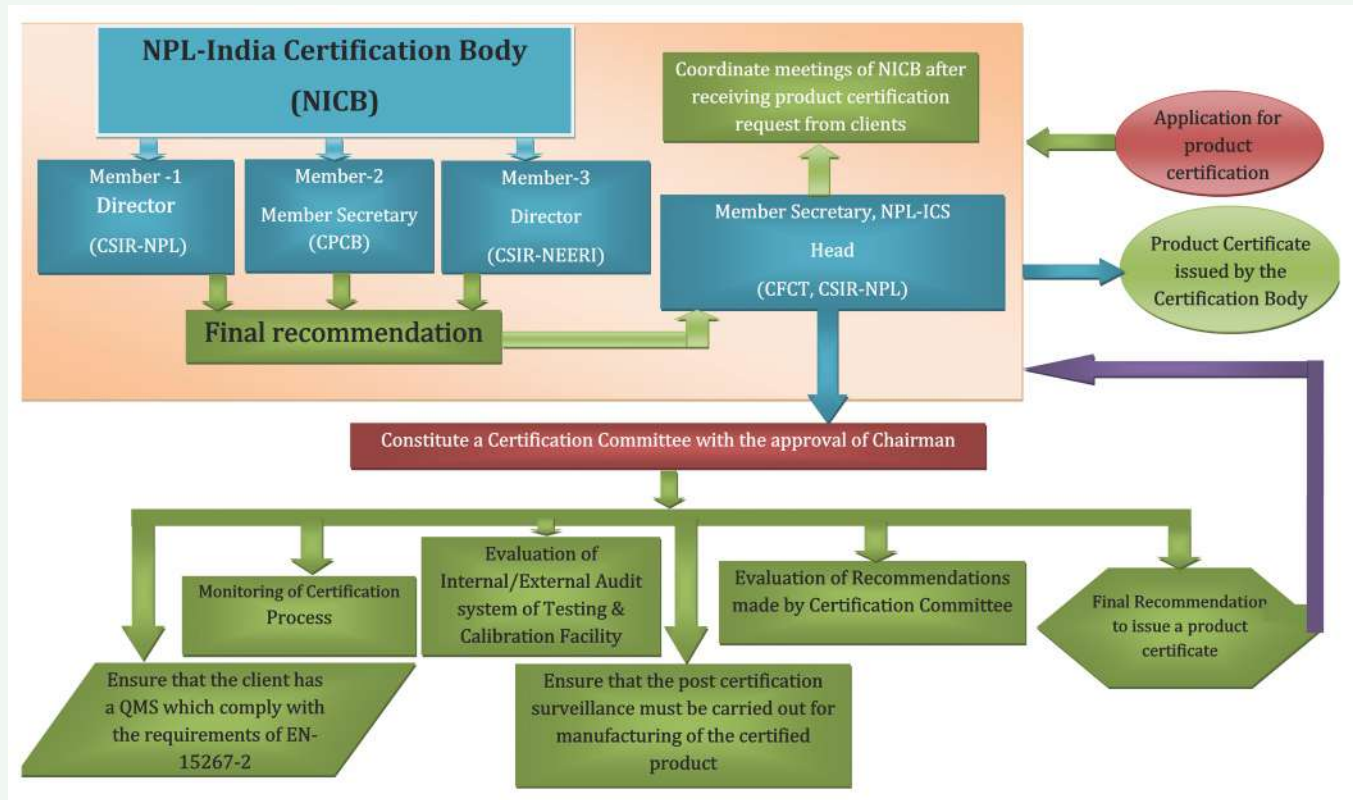


Figure 3: The diagram shows the administrative structure and role/responsibilities of CSIR-NPL-India Certification Body (NICB)

The role and responsibilities shall be defined as

Member Secretary, NPLI CS :

- Pre-evaluation of applications
- Constitute a Certification committee
- Arrange meetings (with permission to the NICB members)
- Ensure that the certification process must be completed within the pre-decided time frame
- Issue/deny the product certificate as per the recommendation of NICB.

The NICB :

- Overall supervision and ensure that all the components of NPLI CS are in accordance with the requirements of ISO-17065.
- Evaluate all the Audit reports and recommendations/comments/suggestion provided by the audit committee and ensure that the product/system meets the requirements in accordance with ISO-9001, ISO-17025 and ISO-17065.

- Evaluate the product specification and ranges of parameters as requested by manufacturer for certification.
- Ensure that the measurement system fulfils the requirements of the guideline notified by regulatory body (as applicable).
- Ensure that the proposed methodology fulfil the requirements of Indian Environmental guidelines
- Evaluate the recommendations made by certification committee on the basis of performance conformity test reports issued by National Testing and Calibration facility.
- Final recommendation for issuance/rejection of certification.

5.2 Certification Committee

The proposed certification committee will be seven members administrative/technical team headed by CSIR-NPL and constituted by members secretary, NICB. The team comprises four permanent members which includes chairman (Head, of Environmental Sciences & Biomedical Metrology Division, CSIR-NPL) and one each from CSIR-NPL, CPCB and CSIR-NEERI. The permanent members will play the administrative role. However, the other three members will be co-opted as per the required technical/academic expertise on case to case basis. The three co-opted members must be associated with independent institutes or organizations like IITs; NABL or other academic institutes. The term of the co-opted members will be defined by the NICB depending upon the process of execution time required for the certification of specific product. The role and responsibilities of the committee fully comply with the requirements of ISO-17025 and other applicable international norms/standards. The main role of the certification committee will be to evaluate client application to design a suitable test programme. The committee supply the test programme to the Testing and Calibration facility to conduct the required tests on the product as per designed test programme. In the mean while, the committee will submit a request to member secretary, NICB for client's site audit report which will be done by the Audit team constitute by Quality Manager, CSIR-NPL. The audit team and the testing and calibration facility will submit the respective reports to the committee. The committee will then evaluate both the reports and submit its final recommendation to the NICB for issue/rejection of the required certificate. If the committee does not recommend a product for certification then client will ask committee to provide a report which includes scope of improvement. Figure 4 shows the administrative structure and its roles and responsibilities.

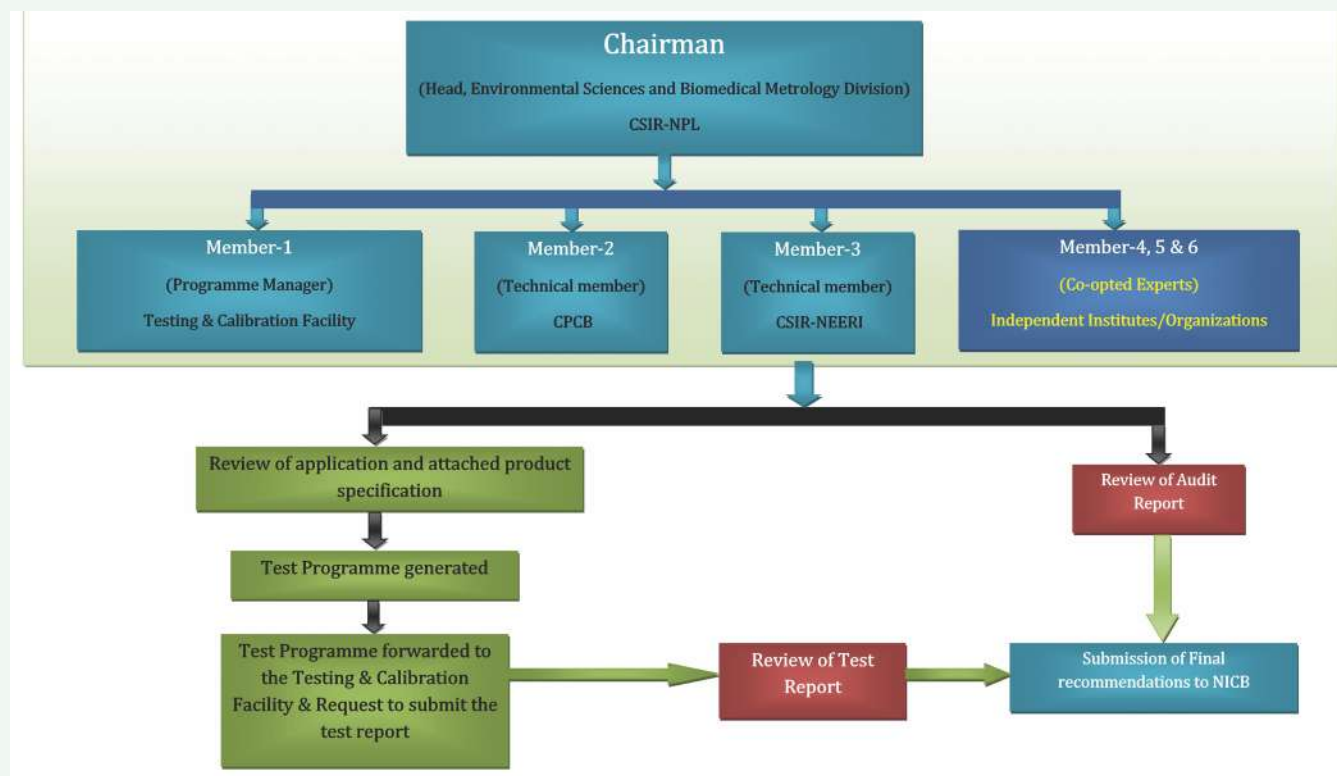


Figure 4: The diagram shows the administrative structure and role/responsibilities of Certification Committee

5.3 Testing and Calibration Facility (Laboratory Testing)

The Testing and Calibration Facility will be established in CSIR-NPL campus, New Delhi for testing and calibration of OCEMS and CAAQMS suitable for Indian Environmental conditions. The proposed facility will include automation and data handling and report generation, detailed definition of the required infrastructure and facilities (e.g. power, environmental control of enclosure, bulk gas supply and physical interfaces.). The proposed facility shall comply with the requirements of ISO 17065 and ISO 17025 (requirements for the laboratory test facility). The facility will be fully capable for testing and calibration of extractive, in-stack or cross stack measurements to allow more than one system to be tested at a time as per the test programme generated by certification committee. The proposed facility will allow to test the online continuous emissions monitoring systems (OCEMS), continuous ambient air quality monitoring systems (CAAQMS) and data handling systems (DAHS) to the harmonised with international norms/standards. The facility will also permit to simulate the conditions in a stack chimney at power stations. It will consist of two temperature controlled ovens each with its own gas cell. The pollutant species of known concentrations will be introduced into each cell under controlled conditions of temperature and humidity.

The proposed test facility will be capable to perform all relevant tests on two identical systems. These two systems will have to be tested in the laboratory and field. It will be the responsibility of the test facility personnel to ensure that each individual component with all measurement channels operating simultaneously meets the performance criteria in a multiple component system. The changes in the environmental and test conditions shall not have a significant influence on the tested performance characteristic. Therefore, all environmental and test conditions influencing the system shall be kept stable as far as practicable. The environmental and test conditions shall be recorded during the test. All test results shall be reported at standard conditions. The test facility will also allow to evaluate the performance of the system at the lowest possible range for the intended application chosen by the manufacturer. If the system to be used for industrial plants requiring assurance over higher measurement ranges, then the test facility may perform selected additional tests to demonstrate satisfactory performance over higher ranges. These additional tests shall at least include evaluations of the response time and lack-of-fit. After performing the required tests, the testing and calibration facility prepare a test report as per the guideline provided the NICB and the same will be submitted to certification committee for review. Figure 5 shows the flow diagram of role and responsibilities of proposed Testing and Calibration facility.

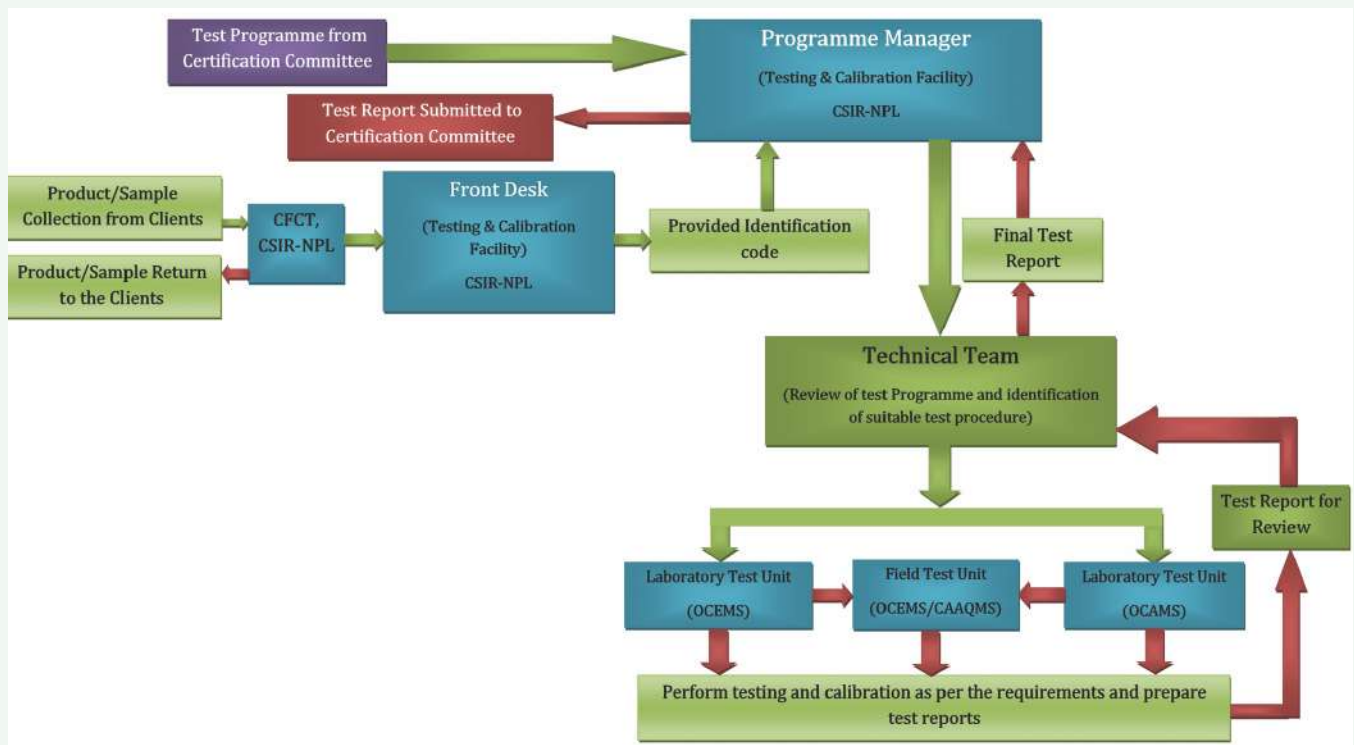


Figure 5: The diagram shows the administrative structure and role/responsibilities of NPL-Testing & Calibration Facility

5.4 Option for testing and calibration certification (without type approval certification)

The proposed scheme will have an option for clients to get their instruments/equipment only tested and calibrated from the proposed facility. The required scheme is already in place with CSIR-NPL but the inclusion of proposed Testing and Calibration facility is to be needed. Figure 6 shows the structure and layout which describes the said testing and calibration scheme for environment monitoring systems.

5.5 Possible Partner Organizations for Field Testing

The proposed testing and calibration facility will also be capable to conduct three months field testing as per the requirement of international norms and QAL-3 as adopted by other international certification agencies. The testing and calibration facility may sub-contract field testing of the system to another organization. It is the responsibility of the main testing and calibration facility to ensure that the sub-contracted organization is accredited by National Accreditation Board for Testing and Calibration Laboratories (NABL) and registered with regulatory body (CPCB) for the scope of work sub-contracted. If required CSIR-NPL may ask any other laboratory (must comply with the requirements of ISO-17025 to perform suggested testing) to conduct the same and submit the report to main test laboratory. The main test laboratory ensures that the sub-contractor shall have procedures in place for providing an

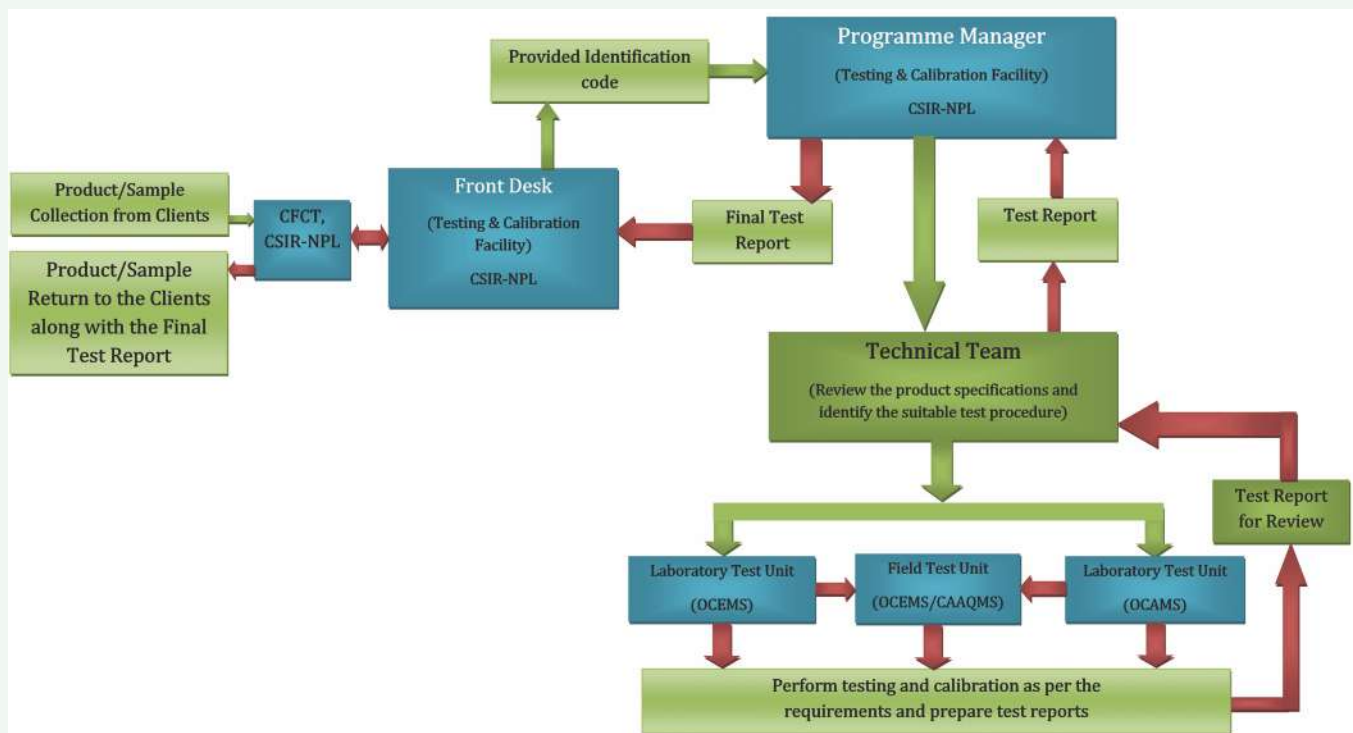


Figure 6: Structure and layout for testing and calibration scheme for environment monitoring systems

estimate of the uncertainties relating to results. This information shall be made available to the sampling organisation for inclusion in their report. The final test report will be compiled/generated by CSIR-NPL testing & calibration facility and the same will be submitted to certification committee.

CSIR-NPL will help in developing capacity for technical competencies of the organizations/laboratories intended to undertake this assignment through organization of training programme.

5.6 Audit Committee

The Audit committee will be comprises of a chairperson and two members which will be constituted by the Quality Manager of CSIR-NPL. The chairperson and other two members of audit committee will be selected from the pool of technical experts on case to case basis. During pre-certification audit, the audit committee shall visit the manufacturer's site for evaluation of manufacturer's quality management system as per the guidelines and requirements of ISO 9001 and prepare the audit report besides identifying the three sample instrument to be used in tests which will be submitted to the test facility by the manufacturer for certification process. The sample instruments will be returned after the completion of evaluation process for certification. The audit report shall be submitted through Quality Manager to the certification committee for its final recommendation to the NICB for issuance/rejection of the certificate. Also, the quality manager of CSIR-NPL shall be responsible to arrange post certification audit and report after 24 months from the date of issuance of certification to review the validation of issued certificate or as and when required by NICB.

The role and responsibilities of each individual member of the audit team shall be defined as :

- i. **Chairperson** : To supervise the assigned audit task.
- ii. **Member 1 (Technical expert)** : To ensure that the product matches with the design details, instrument specification & measurement methodology as per the information provided by client with certification application.
- iii. **Member 2 (Assessor- ISO 9001)** : To ensure that the client quality management system meets the requirements of ISO 9001:2015.

6. Client

To maintain the impartiality, the client (manufacturer) must be independent of the NICB/ Certification Committee/ Audit Committee/ test facility or any other party acting on behalf of these components of NPLI CS.

The following role and responsibilities of client shall be defined to get their product certified by the NICB :

- i. Shall be certified as per ISO 9001:2015
- ii. First approach to the MS-NPLI CS and submit the scope of the testing with the application. The scope includes the type of equipment/instrument, its uses/ installation and range of measurement. The process can be initiated only after signing of an agreement between client & MS-NPLI CS (on behalf of NICB).
- iii. Obtain a pre-certification assessment of the quality management system to demonstrate its compliance with the relevant ISO guidelines.
- iv. Submit two identical equipment/instruments which are identified by the Audit Committee (constituted by the Quality Manager of CSIR-NPL) along with requirements intended in prescribed application form.
- v. Ensure post certification quality assurance and control of manufacturing to meet the qualified performance criteria.
- vi. Contact NICB through MS-NPLI CS and provide details of design change to seek advice for complete or partial re-testing of the product.
- vii. Record all the changes and notify same to NICB.
- viii. Must have in place a complaint handling process and provide required information during investigation of complaint.

7. Management System of NICB

The management system of the proposed NPL-India Certification Body (NICB) comply the requirements of ISO-17065 (section - 8). As per the requirements of ISO 17065, the NICB must have a collection of management system documents, controlled documents and records, and must perform management reviews and internal audits in accordance with defined procedures and schedules. Finally, the NICB is required to address corrective as well as preventive actions. Being a NMI, CSIR-NPL already has a well defined management system which comply all the requirements of ISO-17025. Therefore, certain modification and inclusion in the system will be enough to meets the requirements of ISO-17065.

8. Nodal Agency for Implementation of Certification Scheme

CSIR-National Physical Laboratory will act as nodal agency to implement the proposed certification scheme. The Director, CSIR-NPL will be the head of the NPLI CS and also empowered to designate/nominate chairperson of audit committee, Member Secretary of NPLI CS and Head/In-charge of Testing and Calibration facility.

CSIR-NPL has three distinctive groups namely (i) Quality Manager, (ii) a Centre for Calibration & Testing (CFCT) Section which acts as an interface between all the calibrating & testing groups of CSIR-NPL and (iii) Scientific & Technical staff engaged in testing, calibration

and research activities. In the proposed certification scheme all the three entities will play respective roles to eliminate any conflict of interests.

9. The Time Frame

The process execution time for certification starts from the date of submission of request application the client. The overall time required for proposed certification from submission of application to issue of certificate will be twenty months. The required time for execution of whole process has been summarised above. The whole process is divided into 10 sub-parts and marked the maximum time required to execute the same.

Sr. No.	Process	Months									
		2	4	6	8	10	12	14	16	18	20
1.	Review of application & formation of certification committee	█									
2.	Review of test requirement and preparation of test programme by certification committee		█								
3.	Execution of Laboratory Test programme by Testing and Calibration facility			█	█						
4.	Field Test conducted by Testing and Calibration facility or by the sub-contractor				█	█	█				
5.	Manufacturer's site Audit and preparation Audit Report						█	█			
6.	Generation of Final Test Report by Testing & Calibration Facility							█	█		
7.	Evaluation of Audit and Test Report by Certification Committee and submission of recommendations to NICB								█	█	
8.	Evaluation of Recommendations by NICB and issuance certificate									█	
9.	Representation by manufacturer (if any)										█
10.	Conclusion of the process with final remarks by NICB										█

10. Validity of the Certification

The certificates or product approval issued under this certification scheme will be valid initially for five years, subject to 2 yearly review by NICB and the satisfactory control of manufacturing processes along with the design changes, compliance with the requirements of international norms/standards. The NICB keeps the validity of the certification of the product under continuous appraisal, taking into account that the reports from technical changes to the product, post-certification surveillance as per the international guidelines, any changes in the technical requirements notified by the Regulatory Body (CPCB), and any complaints from users. Any deviation or change in the components (as approved), process (flow sensing or other sensing instruments) affecting the performance may invite re-certification or re-approval. Unauthorized use or transfer of certificates / approval to other manufacturer may invite penal offense.

11. Certification Mark

Holders of NPLI CS certificates are licensed to use the NPLI CS certification mark (figure 7) in prescribed format or as directed by NICB on certified products and on literature or documentation directly associated with the certified product(s).



Figure 7: Certification Mark to be used on the products certified by NICB under NPLI CS framework

NPLI CS certification is for a complete system and not to be implied for individual components used within the product. Use of this certification mark will be verified for compliance with the NPLI CS regulations during audit and surveillance of the manufacturing process. The NICB shall immediately cease the use of certification mark, if any breach of certification regulations or suspension or cancellation of the relevant certificate(s). The certificate holders shall not use this certification mark other than the certified product(s).

12. Certificate Security System

The proposed certification system will also have preventive plan for illegal use of certificates. Figure 8 shows the flow diagram depicted the preventive plan.

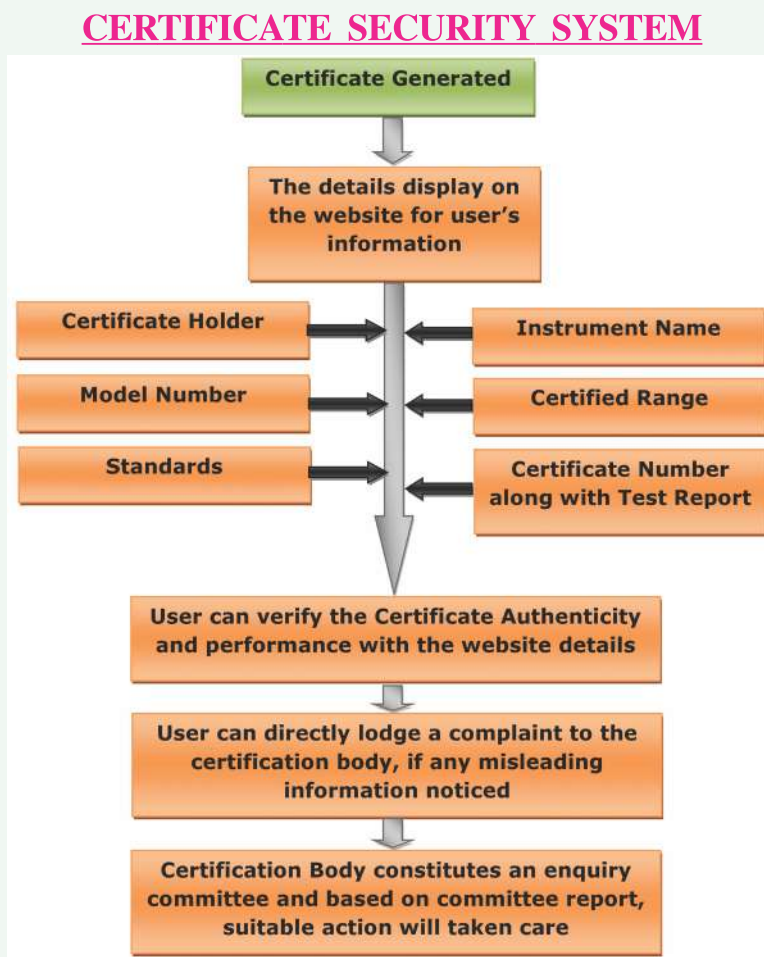


Figure 8: Flow diagram of preventive plan for illegal use of certificate

In the proposed plan, a separate website will be in place under the NICB. The website will have all the information including the list of manufacturers possessing the product certificate issued by NICB. The details of the certified products includes following information

- a. Name of the certificate holder
- b. Instrument name
- c. Model number
- d. Certified range
- e. Standards
- f. Certification number issued by NICB along with the test report

This will also enable the users verify the claimed certificate and the performance of the instrument before placing purchase order. The website will also have complain tracking system from where the user can register lodge a complaint, if any misleading information noticed by him. The NICB will directly access the compliant and immediately form enquire/fact finding committee and ask manufacturer to present in-front of committee. The NICB will take suitable action against the manufacturer and the same will be informed to the regulatory body for further necessary action.

13. Grievance Redress Mechanism

The NPLI CS framework also provided a Grievance Redress Mechanism (GRM) to access to mechanisms that are legitimate, reliable, transparent, and cost-effective to enable the clients to present their grievances and find solutions that satisfy their needs and aspirations. This also enables to clarify misperceptions or resolve confusion among various stakeholders. The NPLI CS GRM complies with the requirements of clause 7.13 of ISO 17065 in which the existing CSIR-NPL's authority will act as an interface between client and NICB. CSIR-NPL has the following process for receiving, evaluating and making decisions on complaints and appeals by which the certification body would be able to track the actions undertaken to resolve the complains and appeals.

The complaint and appeal handling process of NPLI CS is available with Coordinator-Customer Complaints (CCC), CSIR-NPL and is provided to any interested party, if requested. The complaint handling process of CSIR-NPL is as follows:

In this GRM the complaints are received by the designated member secretary of NPLI CS i.e. the head of CFCT, CSIR-NPL in writing duly signed through fax/post/by hand or email and forwarded to CCC. A complaint number is assigned and acknowledged by CCC (whenever possible).

- i.** Upon receipt of a complaint or appeal, the CCC of CSIR-NPL shall confirm whether the complaint or appeal relates to certification activities for which it is responsible. If so it acknowledge the same with a complain number and address it appropriately.
- ii.** After that the complaint or appeal will be forwarded to the apex body of the certification scheme i.e. to NICB
- iii.** The NICB shall be responsible for gathering and verifying all necessary information (as far as possible) to progress the complaint or appeal to a decision.
- iv.** The decision resolving the complaint or appeal shall be made by, or reviewed and approved by an independent committee having members not involved in the certification activities related to the complaint or appeal.
- v.** To ensure that there is no conflict of interest, personnel (including those acting in a

managerial capacity) who have provided consultancy (see 3.2) for a client, or been employed by a client, shall not be used by the certification body to review or approve the resolution of a complaint or appeal for that client within two years following the end of the consultancy or employment.

- vi. The NICB shall give formal notice of the outcome and the end of the complain / appeal process to the complaint/ appellant as applicable whenever possible and also take any subsequent action to resolve the complaint or appeal, if needed.

The time frame for addressing grievances in the Grievance Redress Committees of the NPLI CS will be stipulated as 2-3 weeks from the time of receiving the complaint.

14. Abbreviations

BIPM	:	Bureau International des Poids et Mesures
CAAQMS	:	Continuous Ambient Air Quality Monitoring Systems
OCEMS	:	Online Continuous Emission Monitoring Systems
CFCT	:	Centre for Calibration and Testing
CIPM-MRA	:	International Committee for Weights and Measures - Mutual Recognition Arrangement
CPCB	:	Central Pollution Control Board
CSIR	:	Council of Scientific and Industrial Research
DAHS	:	Data Acquisition & Handling System
EN	:	European Norms
ICS	:	Indian Certification Scheme
IIT	:	Indian Institute of Technology
ISO	:	International Organization for Standardization
MCERTS	:	Monitoring Certification Scheme for Equipment, personnel and organisations
NABL	:	National Accreditation Board for Calibration and Testing Laboratories
NEERI	:	National Environmental Engineering Research Institute
NICB	:	NPL-India Certification Body
NMI	:	National Metrology Institute
NPL	:	National Physical Laboratory
PM_{2.5}	:	Particulate Matters of the size of 2.5 micron
PM₁₀	:	Particulate Matters of the size of 10 micron
QAL	:	Quality Assurance Level
SI	:	The International Systems of Units
TUV	:	Technischer Überwachungsverein
USEPA	:	United States Environmental Protection Agency



CSIR-NPL Wind Tunnel Facility



CSIR-NPL Primary Ozone Standard (SRP 43)

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