Seminar on

Scheme for approval of IT test Laboratories

for

eGovernance Solutions

Welcome to the Participants

17.01.2014

Bangaluru

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STQC

Standardisation
Testing
Quality
Certification

||गुणोत्कर्षे समृध्दि:||

Standardisation Testing & Quality Certification Directorate
An attached office of DeitY

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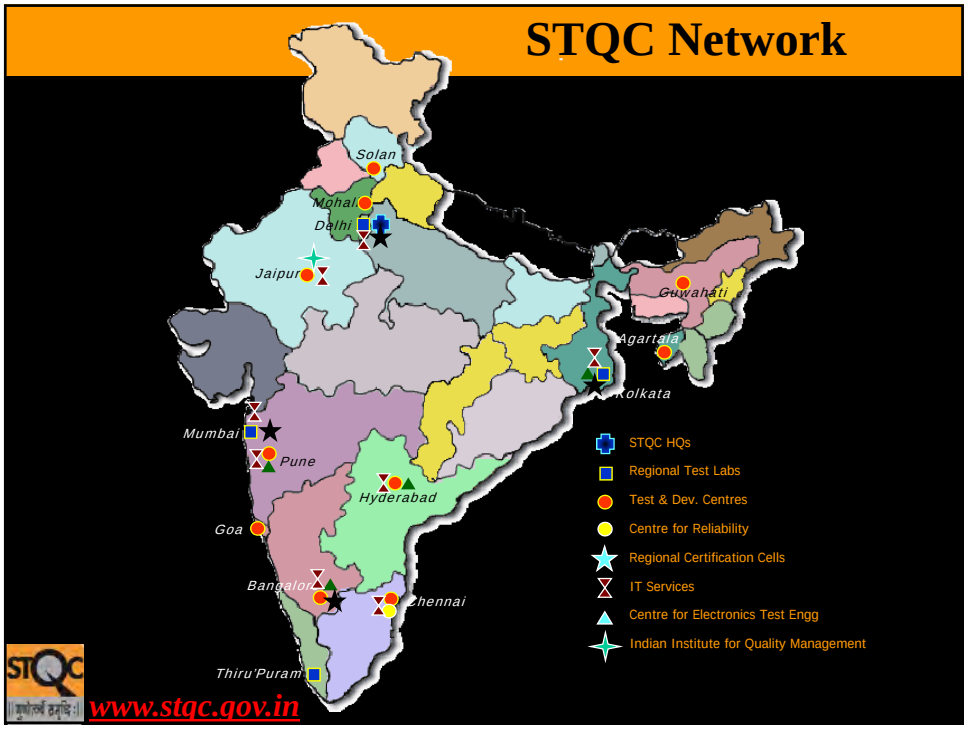
STQC Network



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Our - Objective

STQC was setup under Department of Electronics as a promotional programme 1977. It was upgraded to a level of attached office of DOE 1985 with the following objective :

" To assist small and medium enterprises in electro-technical sector in improving the quality of their products through Testing & Calibration services."

In tune with the current needs when DOE became Department of Electronics & Information Technology , STQC has redefined its objective:

" To be a key enabler in making Indian organisations and IT users achieve compliance to International Quality Standards and compete globally"

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STQC - Shifting Focus

- ❖ STQC is shifting its Focus from Service Provider to Framework Provider
- ❖ This will provide opportunities for private Test Houses to Network with STQC and explore new business opportunities
- ❖ STQC will focus on Certification and use empanelled test laboratories as its resource centres
- ❖ Capacity Building will be priority area for STQC

Following Training Programme in this area will be conducted:

- ➢ Overview of ISO/IEC 17025 for S/W Test Lab
- ➢ Implementation of ISO/IEC 17025 for S/W Test Lab
- ➢ Assessor Programme for ISO/IEC 17025 in association with NABL

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Approval and Accreditation

- ❖ STQC has designed an approval scheme for independent IT Test Labs
- ❖ The scope is Testing of eGovernance Solutions
- ❖ STQC intends to recognize and empanel private test houses by means of approval scheme for Testing eGovernance Software
- ❖ STQC is not an accreditation Body and does not want to have conflict with NABL which is National Accreditation Body for Laboratories and work under DST
- ❖ This Software Test House approval Scheme is designed to meet the objective of DeitY and to have Quality assessed Software for eGovernance

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Agenda

- Conformity Assessment in eGovernance - U K Nandwani
- Introduction to the Approval Scheme for ITTL - U K Nandwani
- Requirements of ISO/IEC 17025 for Software Lab – B. Singh
- Experience sharing in IT Test Laboratory accreditation - B. S. Kumar

Panel Discussion

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Contact us

My team can be contacted for any query in this regard and in case required I am available at –

email: dgstqc@deity.gov.in

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Conformity Assessment in eGovernance

17.01.2014

Bangaluru

eGovernance

eGovernance is transformation of internal and external relationship of Government Sector, by using information and communication technologies. This is by re-engineering government service delivery process and aligning it with IT leading to increase an efficiency, effectiveness and transparency.

e-Governance – Need for Conformity Assessment

Benefits

Reduce service time
Improved customer service through up-to-date, accurate data.
Business intelligence for fact based decision making
Increased Government revenue due to reduction in transmission and distribution losses.

Risk

- **Economic Risk**
  - Huge Investment
  - Cost of Technology and Knowledge is high
- **Technological Risk**
  - High obsolesce Rate
  - Dependability/Reliability of Technology
  - Use of right technology
- **Social Risk and User acceptability Risks**
  - Solutions are citizen & business Centric & touch sensitive service oriented issues
  - High expectation

Concerns

- **Users**
  - whether Government services will be available in a convenient way as promised
- **Policy Makers and Administrators**
  - Whether objectives of eGovernance are being achieved (Transparency, availability of Service, compliance with Govt. Rules, procedures, decisions and Regulations)
- **Solution/Service Provider**
  - That system meets the requirements of RFP.

eGovernance Conformity Assessment-Business of Confidence

To have confidence on the eGovernance solution, Administrators and Funding agencies look for an affirmative indication or judgment by independent agency that a product or service has met the requirements of a contract and applicable regulation. The process for determining the degree of compliance of the solution characteristics (as delivered) with the requirements (as desired) by means of objective evaluation is known as a the conformity assessment.

It provides the information on the fulfillment of the provisions of "Request for Proposal" and "Contract Agreement". The techniques used for Conformity Assessment are sampling, testing, inspection, review, assessment, evaluation and certification.

Conformity Assessment - Purpose

Business of Confidence

- To Administrator
  - Achieving his vision
  - Addressing his concern
  - Strategies handling of complex problems
- To solution providers
  - A well accepted approach based on ISO standards.
  - Common methodology and criteria - fair playground for all solution providers
  - Independent third party
- To Users
  - Solution is usable, secure and meet Service Level Agreements
  - Solution is functional and legally compliant

Benefits and Risks

When applied correctly, conformity assessment can

- **Provide purchaser, a confidence in the suppliers, whose services they purchase**
- **Help to assess the strengths and weaknesses of the initiatives and projects**
- **Reduce Risks by providing inputs for early monitoring and timely corrections**
- **Help funding agencies to get confidence on the outcome of the project**
- **Help businesses to be competitive**
- **Facilitate trust in procurement and supply**
- **Provide a visible link between standards and the market**

However, if applied incorrectly, conformity assessment can also…

- **Be a burden on business by adding cost of demonstrating compliance**
- **Create barriers to procurement and supply**
- **Inhibit innovation**
- **Confuse the market**

Conformity Assessment

e GCA - Objective

Generating Confidence of Citizen and Business
on
e-Government

Through conformity assessment to user-requirements, regulations and Best Practices by Independent Third Party

Rather than

Relying solely on the assertion of the developers and solution providers

eGCA- Quality Gates

eGovernance Conformity Assessment has four Quality Gates

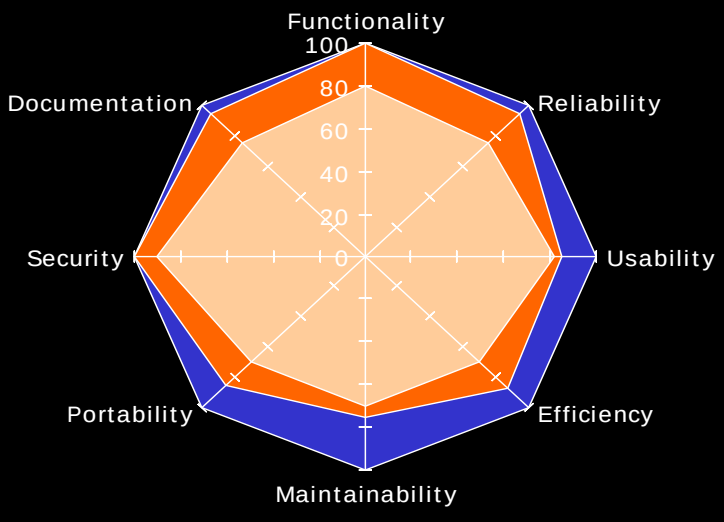
- **Software Application Quality**
- **System and Infrastructure**
- **Service Quality (SLA)**
- **Quality Processes in Government Organisation**

Quality Gate 1 – Software Quality

- Application Quality is basic requirement for successful e-Governance.
- A Quality Model based on International Standards is required.
- Quality model (ISO 25000) describes key Quality Characteristics like Functionality, Security, Reliability, Usability, Performance and Document Quality.
- Testing is done in a controlled laboratory environment and latest test tools to ensure that results are reliable, repeatable & reproducible.
- Test Reports are analysed and Software Quality Evaluation is done to find out Quality score

Distribution of Quality Characteristics

An Illustration



Conformity Assessment

Vision

- **To ensure transparent, cost effective, secure and citizen centric eGovernance services for the common man through evaluation by an independent Body, following global best practices**

Confidence in invisible Government

- **The results of conformity assessment are based on objective evaluation with verifiable evidences. The results are reliable, repeatable and reproducible. Claims based on conformity assessment that solution meets the requirements of "Contract" are expected to inspire greater confidence among stakeholders then claims without such backing**

Viewing Reality

- **Conformity Assessment Framework constitutes a way of viewing reality through a ratio of Compliances and requirements**

Business of Confidence- what is required?

- **Sound Eco-System where buyers (Government Departments), Sellers (Solution Providers) and Conformity Assessment Bodies (Software Test Laboratories) work together in a disciplined way to achieve eGovernance objectives and timelines**
- **This requires Software Test Laboratories are dependable which comes from implementing a domain specific laboratory "Quality Management System"**
- **ISO/IEC 17025 describes requirements for this Quality Management System**

Laboratory Quality Management System (Contd.)

It has two components:

- **Management Requirements**
- **Technical Requirements**

❖ **Management Requirements**

- ❑ Organisation
- ❑ Quality System
- ❑ Document Control
- ❑ Review of Request, Tenders and Contracts
- ❑ Subcontracting of Tests and Calibrations
- ❑ Purchasing Services and Supplies
- ❑ Service to the Clients
- ❑ Complaints
- ❑ Control of Non-conforming Testing
- ❑ Improvements
- ❑ Corrective Actions
- ❑ Preventive Actions
- ❑ Control of Records
- ❑ Internal Audits
- ❑ Management Reviews

Laboratory Quality Management System

❖ **Technical Requirements**

- ❑ Personnel
- ❑ Accommodation and Environmental Conditions
- ❑ Test and Calibration Methods and Method Validation
- ❑ Equipment
- ❑ Measurement Traceability
- ❑ Sampling
- ❑ Handling of Test and Calibration Items
- ❑ Assuring the Quality of Test and Calibration Results
- ❑ Reporting the Results

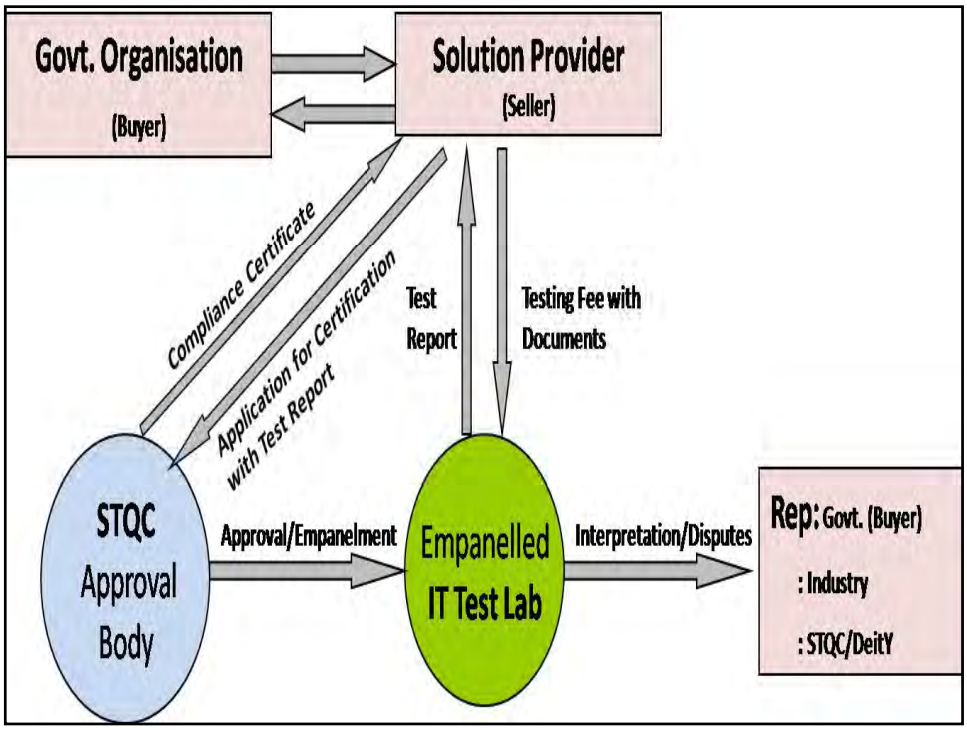
Approval Scheme

For

Information Technology Testing Laboratory

WHY : CONFORMITY ASSESSMENT SCHEME

- No accredited agency for benchmarking & certifications in India
- Solution providers approach STQC labs for evaluation and certification of e Gov products
- Information technology systems and applications are more complex and domain/technology intensive.
- Managing Testing/audit of mission critical e-Governance solutions is very difficult : Collaboration, Churning, Coordination and Cycle
- STQC labs not able to meet growing demand
- Need for “Conformity Assessment Scheme”
- Look for - Model for conformance testing and certification programs

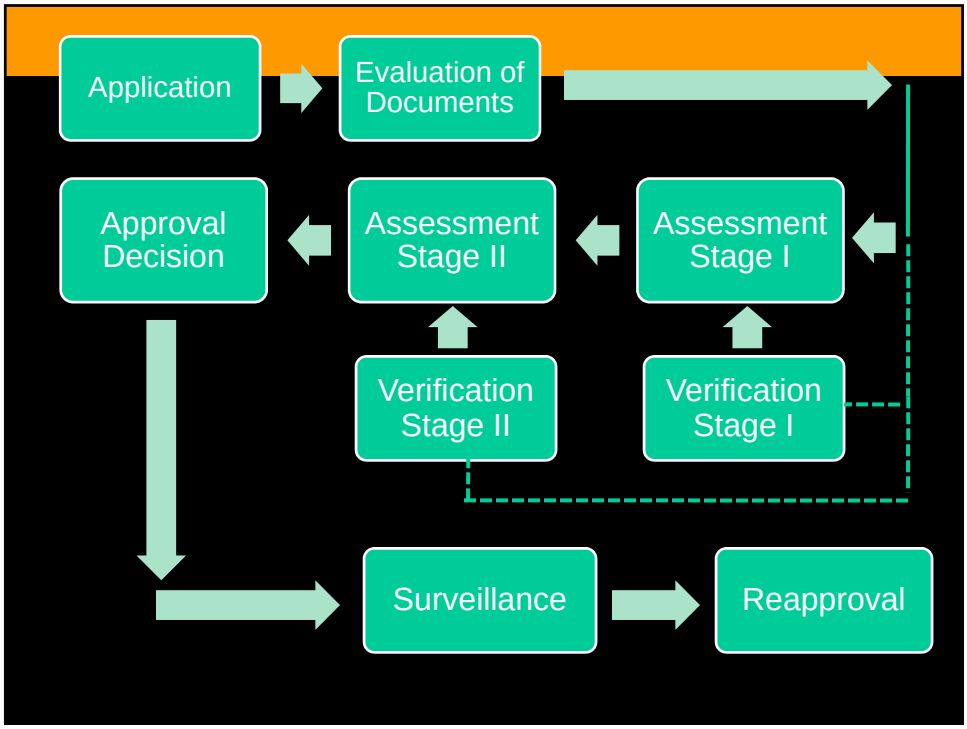


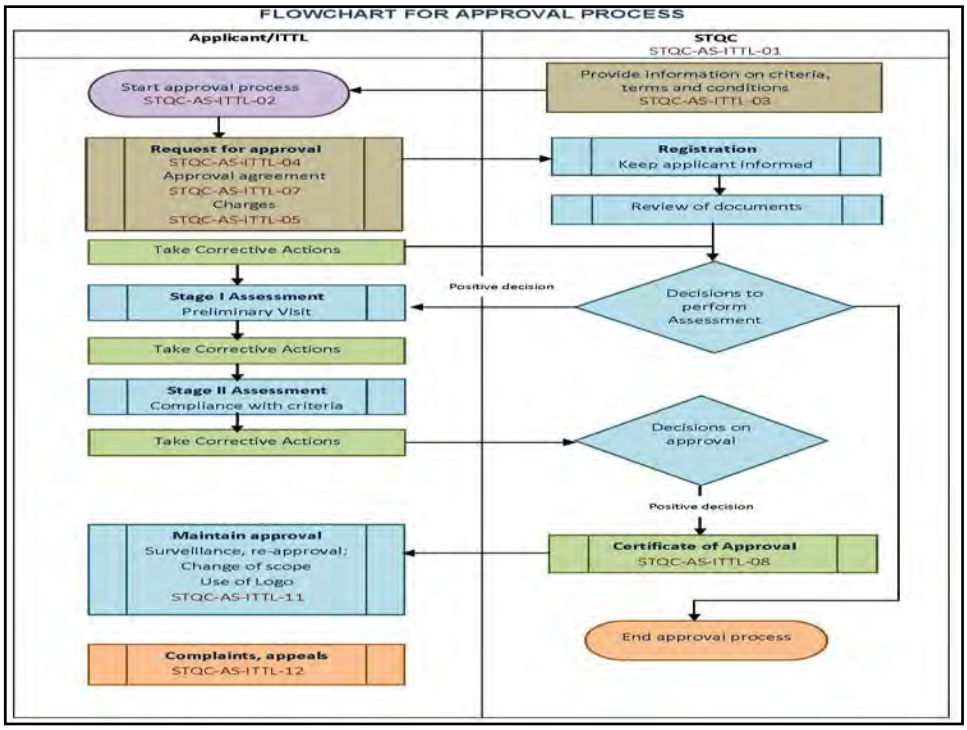
Conformity Assessment

Approval Process for Software Test Houses

PROCESS

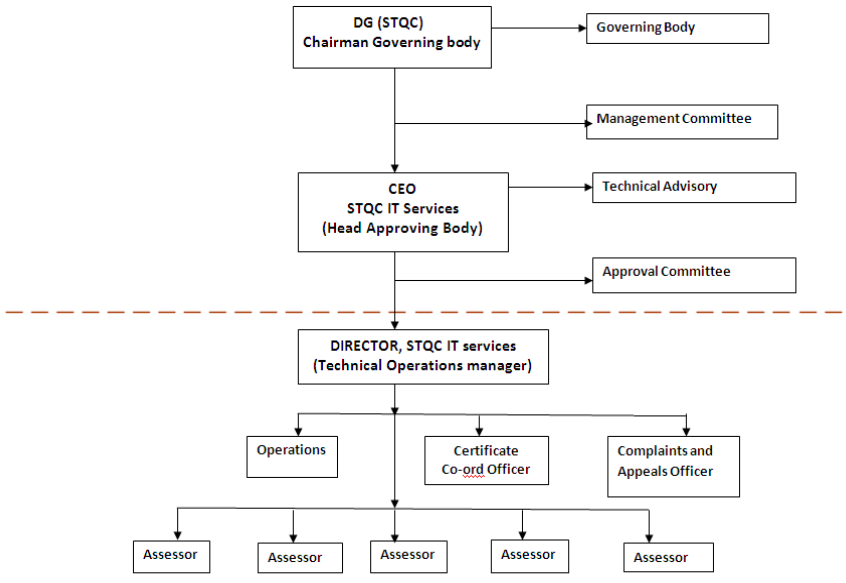
- STQC will be the nodal agency managing the Approval Scheme
- STQC Approval body will operate as per ISO/IEC 17011: 2004 standard " Conformity Assessment-General requirement for accreditation bodies accrediting conformity assessment bodies"
- IT Testing laboratory will be assessed as per ISO/IEC 17025: 2005 General requirements for the competence of testing and calibration laboratories
- Test Management activity will be assessed as per ISO/IEC 25051 (ISO/IEC 29119 under development)
- STQC IT Bangalore as nodal agency for Technical operations of approval scheme


Application
Evaluation of Documents
Approval Decision
Assessment Stage II
Assessment Stage I
Verification Stage II
Verification Stage I
Surveillance
Reapproval


FLOWCHART FOR APPROVAL PROCESS
Applicant/ITTL
STQC
STQC-AS-ITTL-01
Start approval process
STQC-AS-ITTL-02
Provide information on criteria, terms and conditions
STQC-AS-ITTL-03
Request for approval
STQC-AS-ITTL-04
Approval agreement
STQC-AS-ITTL-07
Charges
STQC-AS-ITTL-05
Registration
Keep applicant informed
Review of documents
Take Corrective Actions
Positive decision
Decisions to perform Assessment
Stage I Assessment
Preliminary Visit
Take Corrective Actions
Stage II Assessment
Compliance with criteria
Take Corrective Actions
Decisions on approval
Positive decision
Maintain approval
Surveillance, re-approval;
Change of scope
Use of Logo
STQC-AS-ITTL-11
Certificate of Approval
STQC-AS-ITTL-08
Complaints, appeals
STQC-AS-ITTL-12
End approval process

Conformity Assessment

Certification Body Organisation



SCOPE OF APPROVAL

- **Main disciplines:**
  - Software conformance Testing
  - System conformance Testing
  - Network Testing
- **Types of testing:**

Functional Testing	Interoperability Testing
Application Security Testing	Portability Testing
Performance Testing	Network Testing (Security)
Usability Testing	Network Testing (Performance)
Portability Testing (Application)	Code Review

DOCUMENT STRUCTURE

Sl. No.	Section No.	Version	Control Document Name	Status
1	STQC-AS-ITTL-01	1.0	Master List of Documents	completed
2	STQC-AS-ITTL-02	1.0	Approval Scheme	by 28/2/13
3	STQC-AS-ITTL-03	1.0	Approval Criteria of IT Testing Laboratories	completed
4	STQC-AS-ITTL-04	1.0	Application form for approval of IT Testing Laboratory	completed
5	STQC-AS-ITTL-05	1.0	Schedule of Charges	completed
6	STQC-AS-ITTL-06	1.0	Assessment Forms	completed
7	STQC-AS-ITTL-07	1.0	Approval Agreement	completed
8	STQC-AS-ITTL-08	1.0	Certificate of Approval of IT Test Laboratory	completed
9	STQC-AS-	1.0	Check List for Approval of independent Testing	complete

Tool Kit

- Training Programmes
- Workshops
- Exposure to validated Procedures

STQC

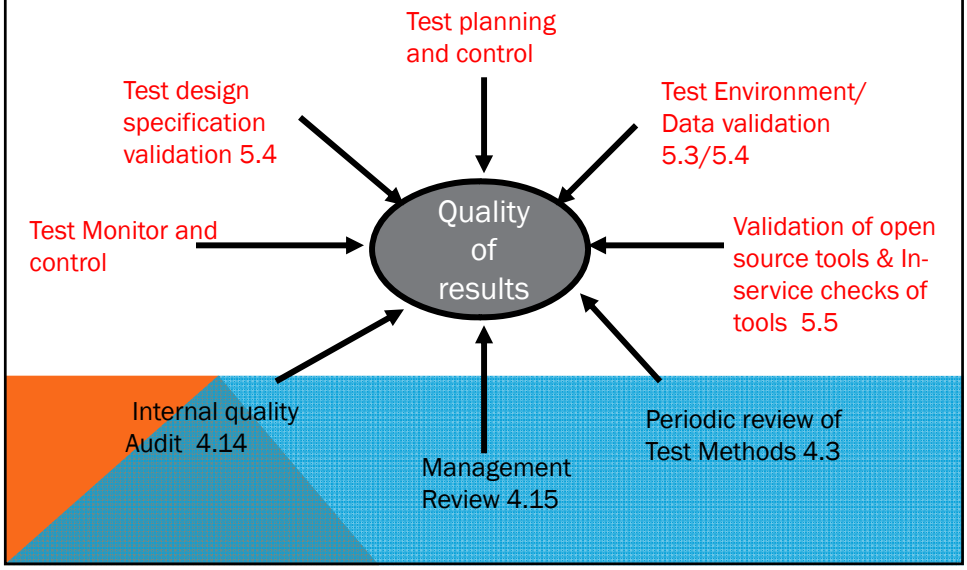
॥ गुणोत्कर्षे समृद्धि : ॥

Thank you

Software Test Laboratory : A2LA Accreditation: Road Map

- **Scope of Operation**
- **Organization structure**
- **Laboratory Infrastructure Development**
- **Capability and Competence Development**
  - Training and Personnel certification
  - Identification of Test processes, Testing techniques, Test methods etc in line with ISO standards
  - Mapping of Test process and Laboratory Good Practices with ISO/IEC 17025
  - Establishment and Implementation of Test processes
  - Identification Test documentation requirements
  - IQA and Management Review
- **Final assessment and Accreditation**

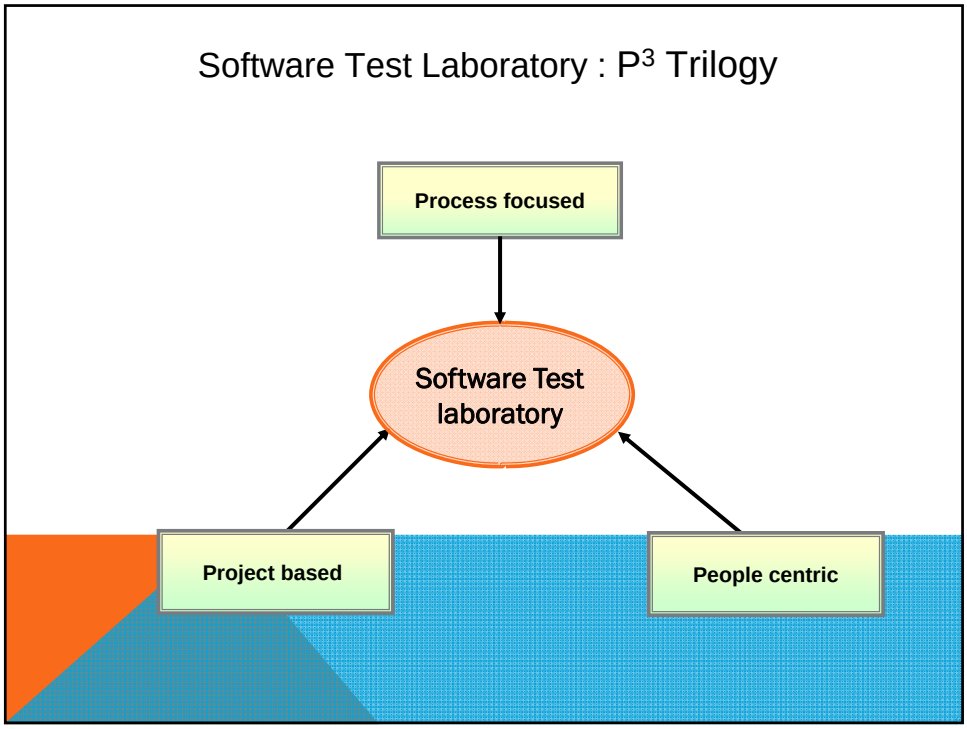
QUALITY ASSURANCE IN SOFTWARE TESTING



SOFTWARE TEST LABORATORY : FEW TIPS

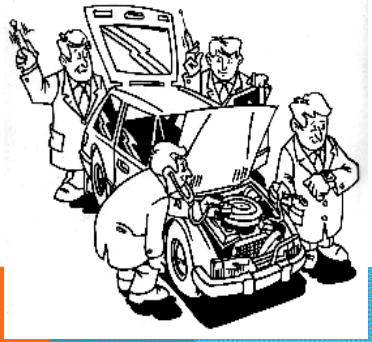
- Generally all Software applications are unique and ridden with complex business rules and algorithms.
- Each software product will entail different types of testing viz Functionality, performance, security, usability, compatibility etc.
- Most of the Technical elements of ISO/IEC 17025 are elaborated and supported with best practices in ISO/IEC Standards
- Technical challenges :
  - Domain and context understanding
  - Test coverage
  - Test environment/data creation
  - Test tool validation
- Other Issues:
  - Schedule demands
  - Customer/ user expectations
  - Availability of Test Environment infrastructure
  - Scope of Project
  - Criticality of the project
  - Adequacy of Requirement document

Software Test Laboratory : P^3 Trilogy



How IT Test laboratory approval scheme is different from other certification ?

Approval scheme
Assessment of Competence

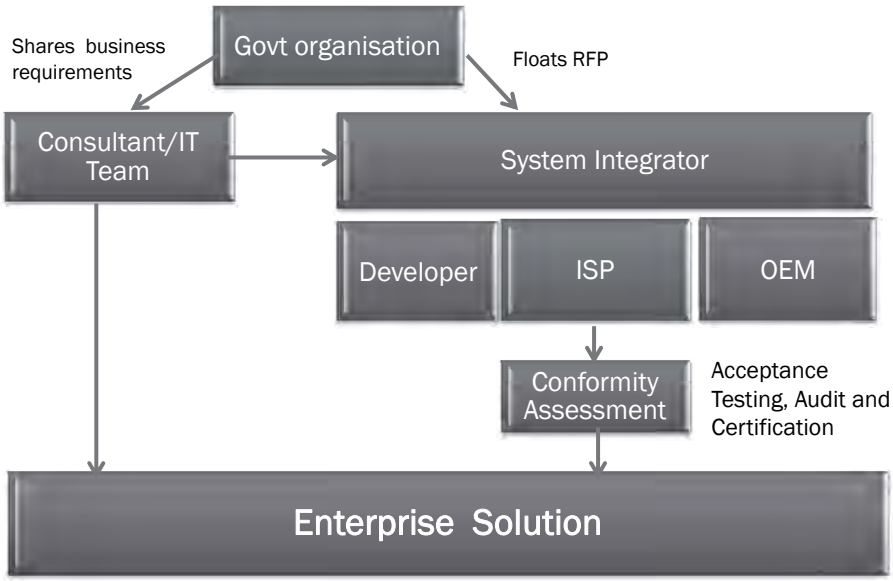


CERTIFICATION
Assessment of Conformity

4

Question ??

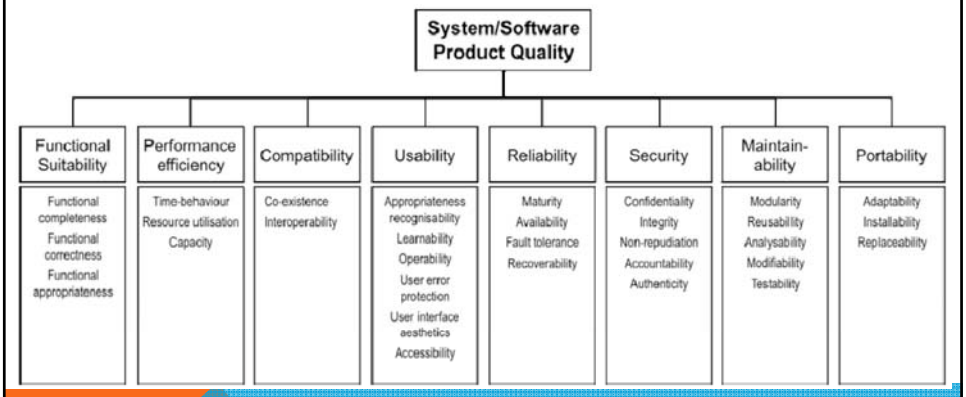
e Governance: IT-Ecosystem



Scope of Conformity Assessment of e Gov System

Audit	Certification
1. Development process Audit (ISO 12207) 2. Infrastructure Audit 3. SLA Reporting system verification & Audit 4. Data Quality Review 5. Manageability Review	ISO 27001 ISO 20000

Software Product Quality Characteristics : ISO/IEC 25010



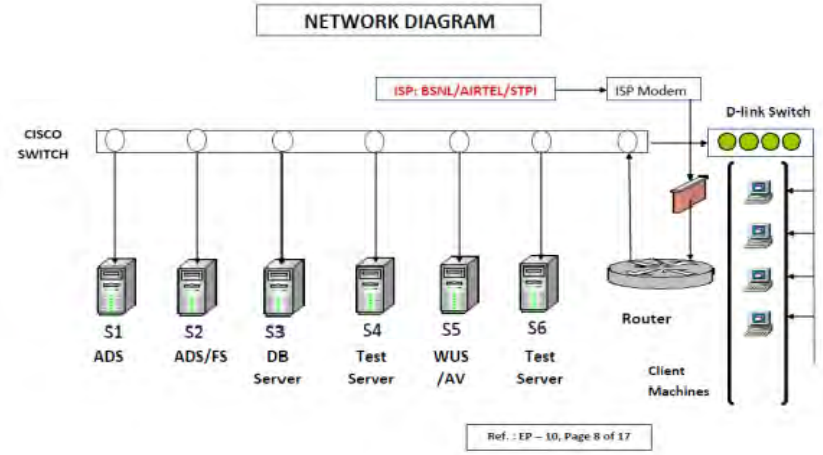
Scope of Software Test laboratory

A2LA Certificate Number: 2686.01

Unit / System Tested	Activity	Reference Standard / Method
Software Applications & Systems*	Conformity Evaluation	ISO/IEC 25051; EP-10
	Functionality Testing	ISO/IEC 25051; EP-11
	Performance / Efficiency Testing	ISO/IEC 25051; EP-12
	Usability Testing & Heuristic Evaluation (Human – System Interaction Analysis)	ISO/IEC 9241, ISO IEC 9126-2; EP-21
	Static Code Review, Inspection & Maintainability Analysis	IEEE 1028, IEEE 1044; ISO/IEC 9126; EP-22
Web Applications & Computer Networks*	Security Testing	OWASP Testing Guide; EP-19
	Vulnerability Assessment, Non-Destructive Penetration Testing	CIS; NIST SP 800-115; EP-24

*This laboratory meets A2LA *R104 – General Requirements: Accreditation of Field Testing and Field Calibration Laboratories* for these tests.

Laboratory Test Environment



Software Testing related ISO/IEC & IEEE standards

- The following ISO/IEC & IEEE International standards are referred that provides a consistent set of definitions, processes, procedures, techniques & best practices for software testing
  - ISO/IEC 29119 : Software and Systems engineering – Software Testing
    Part 1 : Concepts and definitions
    Part 2 : Test process
    Part 3 : Test Documentation
    Part 4 : Test Techniques
    (BS 7925-1:1998, Software testing — Vocabulary
    BS 7925-2:1998, Software testing — Software component testing)
  - IEEE Std 1028-2008, IEEE Standard for Software Reviews and Audits
  - ISO/IEC 25010 : Systems and software engineering —Systems and software Quality Requirements and Evaluation (SQuaRE) — System and software quality models
  - ISO/IEC 25051 : (Software Product Quality Requirements and Evaluation: Requirement for quality of Commercial Off-The-Shelf(COTS) software product and instruction for testing
  - ISO/IEC 12207: Systems and software engineering — Software life cycle processes
  - IEEE Std 1012-2012, IEEE Standard for Software Verification and Validation

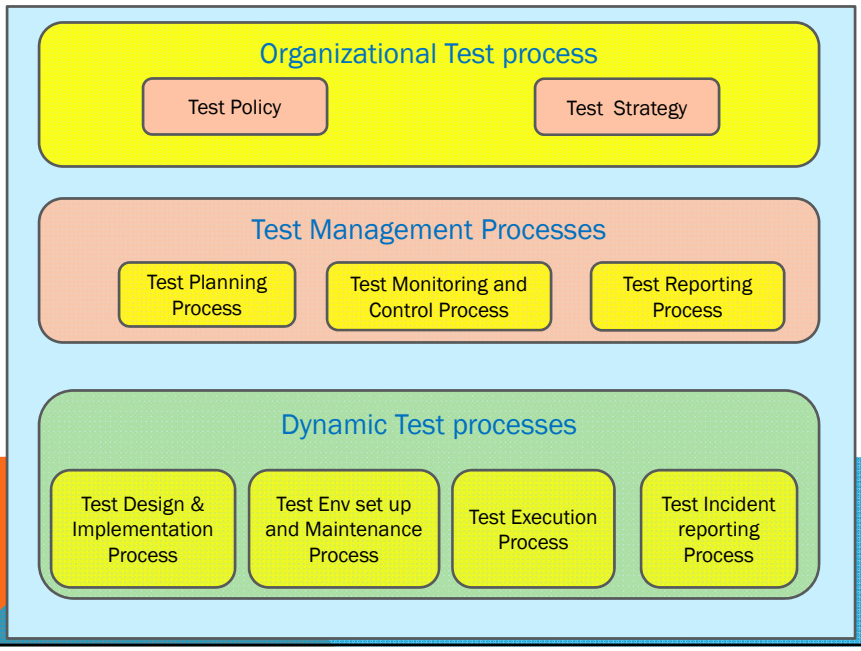
Software Testing related ISO/IEC & IEEE standards

- ISO/IEC 15408: Information technology - Security techniques - Evaluation criteria for IT security
- ISO 9241 : Usability stds Ergonomics of Human system interaction. Usability Testing & Heuristic Evaluation (Human – System Interaction Analysis
- ISO/IEC 23026:2006 Software Engineering – Recommended Practice for the Internet – Website Engineering, Web Site Management, and Web Site Life Cycle
- NIC guidelines on Indian government websites
- OWASP (top 10 issues) for Application security Testing
- CIS standard for Vulnerability Assessment
- NIST 800-115 : Technical guide to Information Security Testing and Assessment

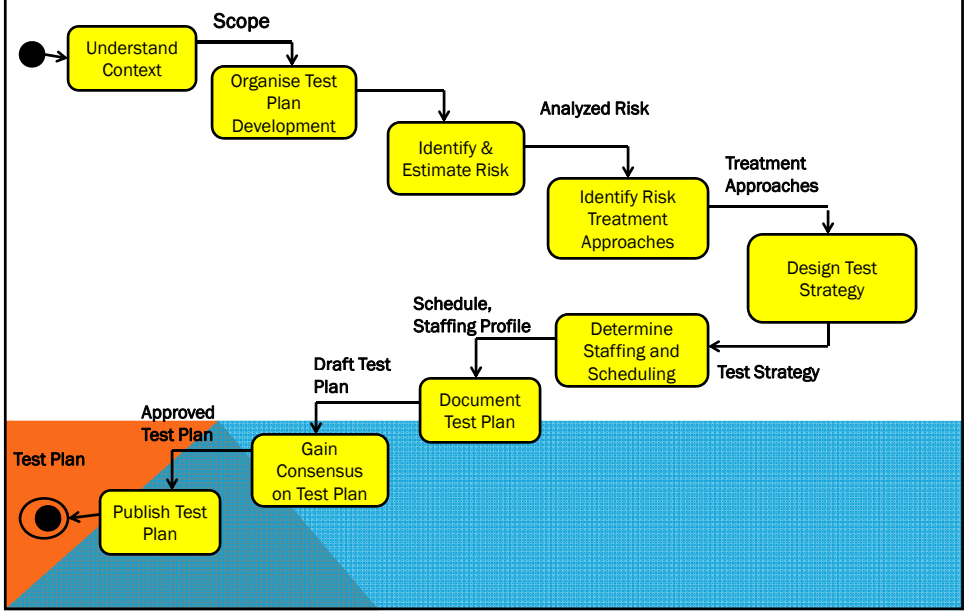
PROCESS MODEL

- Organizational Test process
- Test Management process
- Dynamic Test process

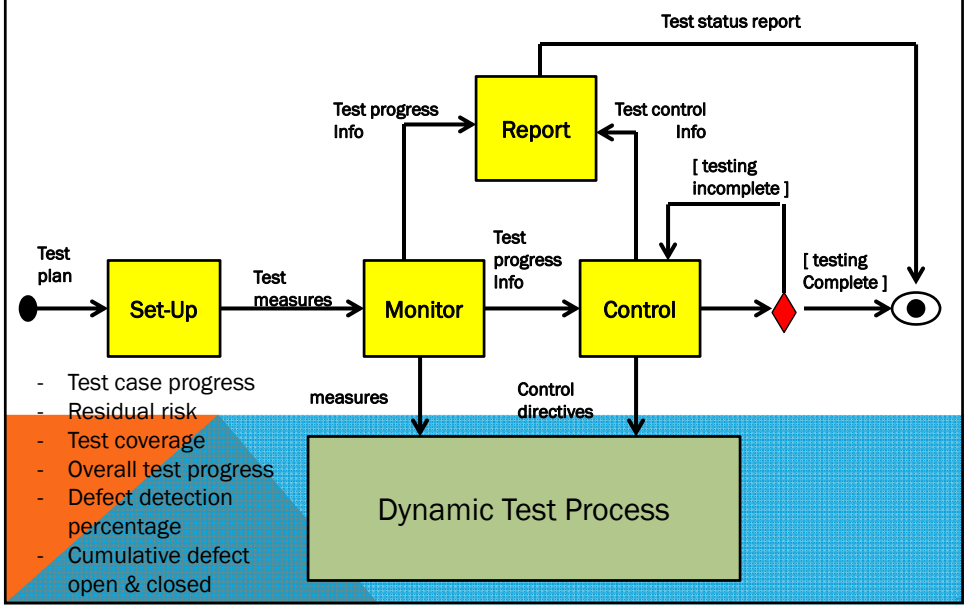
ISO/IEC 29119: MULTI LAYER MODEL TEST PROCESS REQUIREMENTS



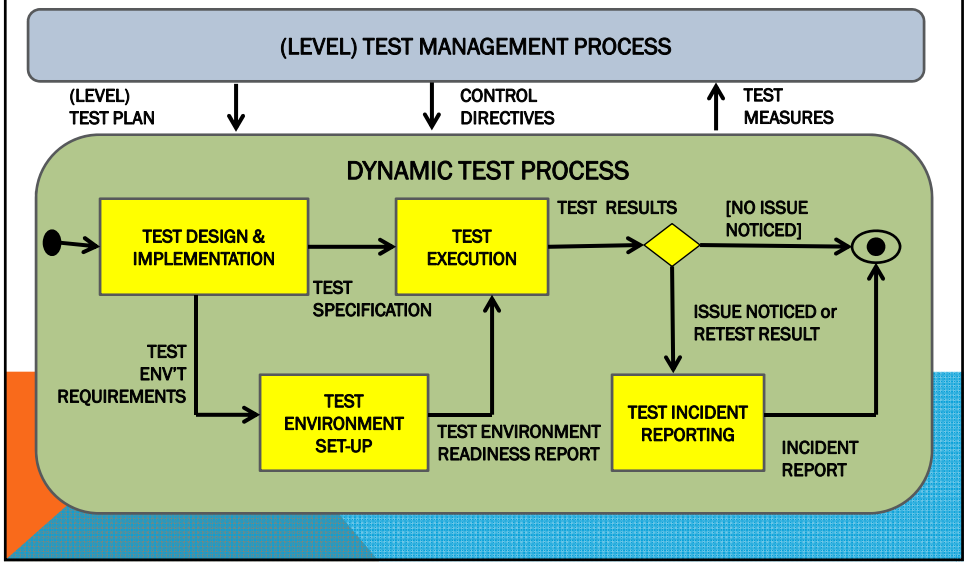
Test Planning Process : ISO/IEC 29119



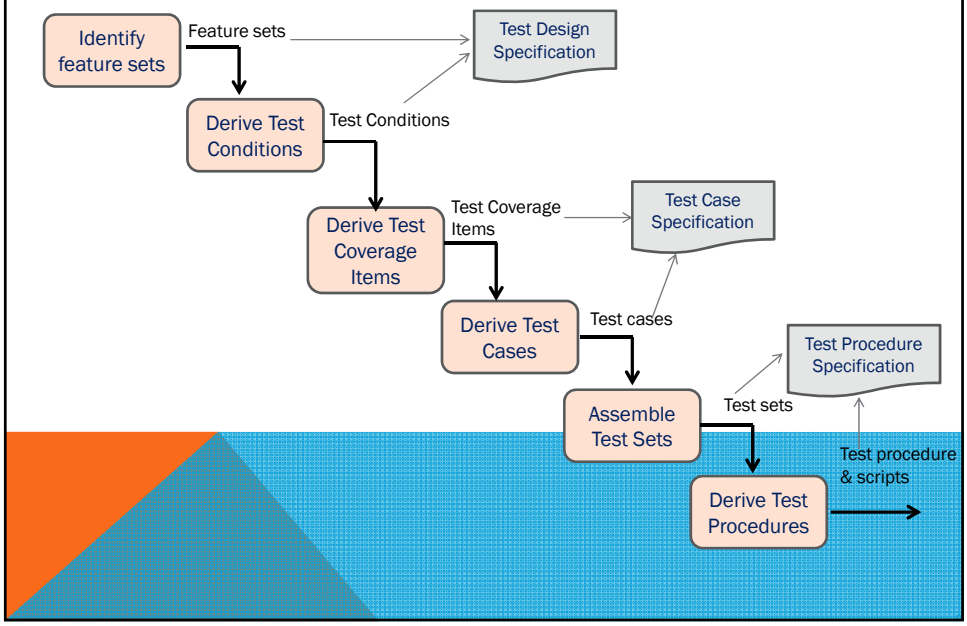
Test Monitoring & Control Process : ISO/IEC 29119

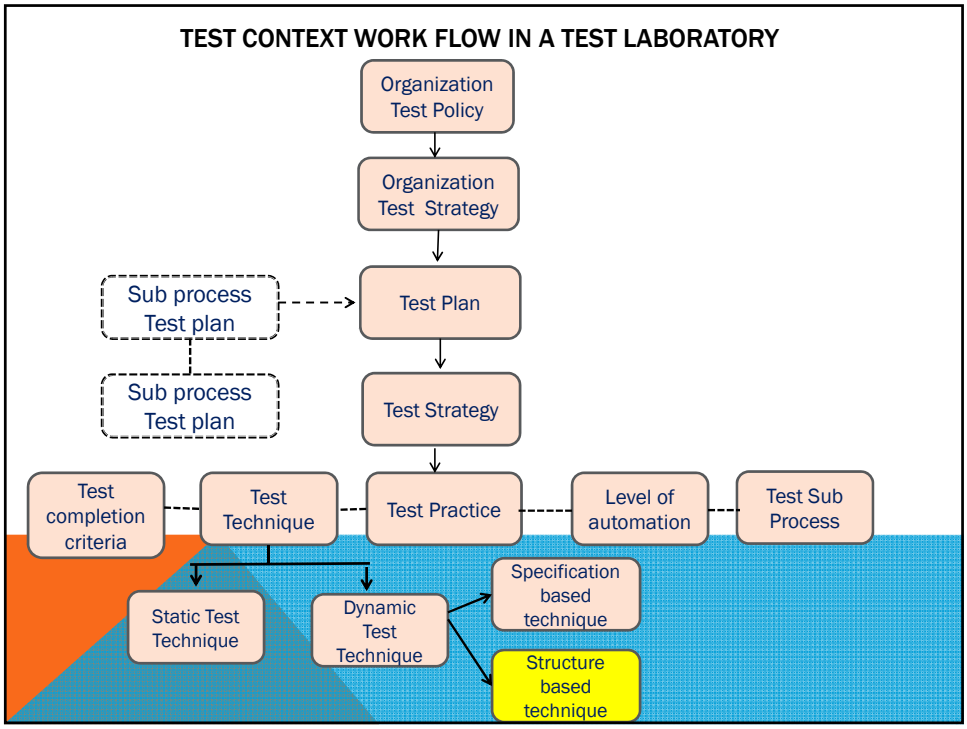


Dynamic Test Process: ISO/IEC 29119



TEST DESIGN & IMPLEMENTATION PROCESS





Executive Procedures

Sl No.	EP NO.	Name of the procedure	ISO/IEC 17025:2005 Applicable Reference
1	EP 01	Placement of Personnel	5.2
2	EP 02	Control of documents	4.3
3	EP 03	Operation of Customer Services	4.4
4	EP 04	Internal Quality Audit	4.14
5	EP 05	Management Review	4.15
6	EP 06	Training	5.2
7	EP 07	Quality Assurance	5.9, 4.10
8	EP 08	Configuration Management	4.3, 4.13,
9	EP 09	Handling Customer Complaint and Feedback	4.7, 4.8
10	EP 10	Operation of Software Test Laboratory	5.3,5.5,5.6, 5.10
11	EP 11	Software Functional Testing	5.4
12	EP 12	Software Performance Testing	5.4
13	EP 13	Software Compatibility Testing	5.4
14	EP 14	Acceptance Testing of Software Application	5.4
15	EP 15	Software Product Evaluation	5.4
16	EP 16	Approval of Sub Contractors	4.5
17	EP 17	Control of non conforming work, and implementation of Corrective actions and preventive action	4.9,4.11,4.12
18	EP 18	Execution of on Site Testing	5.4
19	EP 19	Software Application Security Testing	5.4
20	EP 20	Procedure on Security practices in the Laboratory	5.4.7
21	EP 21	Procedure on Usability Testing	5.4
22	EP 22	Procedure for conduct of software code review	5.4

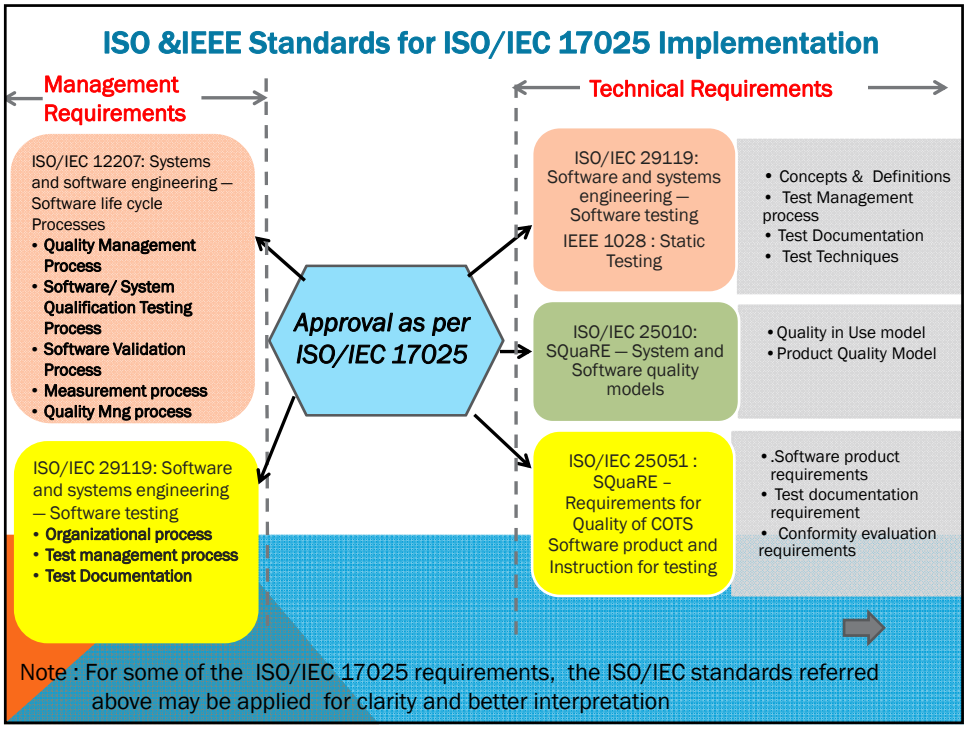
Test Methods

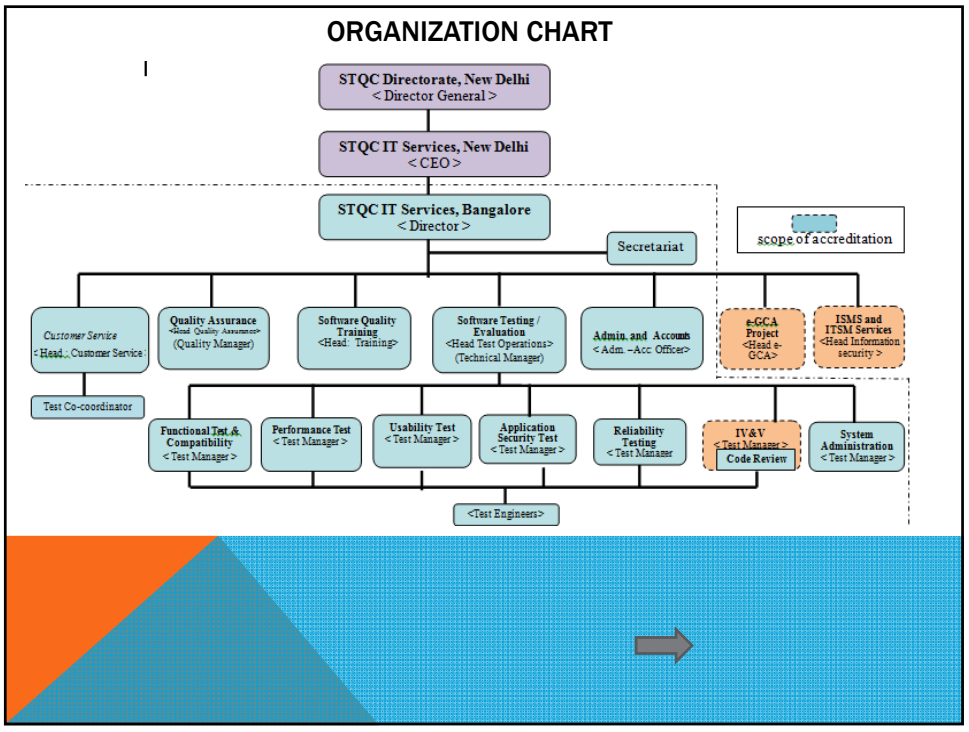
Sl No.	EP NO.	Title of Test Methods
1	TM 01	Designing and Execution of test cases using Equivalence Partitioning
2	TM 02	Designing and Execution of test cases using Boundary Value Analysis
3	TM 03	Designing and Execution of test cases using State Transition Strategy
4	TM 04	Designing and Execution of test cases using Cause Effect Graph
5	TM 05	Designing and Execution of test cases using Orthogonal Array Testing Strategy
6	TM 06	Preparation of Software Test Plan
7	TM 07	Procedure for Anomaly Logging and Reporting
8	TM 08	Procedure for Software Document review
9	TM 09	Procedure for Test Report Preparation
10	TM 10	Preparation of Software Evaluation Plan
11	TM 11	Procedure on Regression Testing

TEST DOCUMENTATION REQUIREMENT: ISO/IEC 29119

- Organizational test documentation
  - Test policy
  - Organizational Test strategy
- Test Management Processes Documentation
  - Test Plan
  - Test Status Report
  - Test Completion Report
- Dynamic Test Processes Documentation
  - Test Design Specification;
  - Test Case Specification;
  - Test Procedure Specification.
  - Test Data Readiness Report
  - Test Environment Readiness Report
  - Test Execution Log.
  - Incident Report

- **Test artifacts are placed under Configuration Management including Requirement document**
- **Access rights to test artifacts is controlled**
- **Test artifacts such as Test Plan, Test cases, test log etc. is periodically reviewed at regular intervals and audit trial is established**
- **Back up of test artifacts are taken at regular intervals**


ISO &IEEE Standards for ISO/IEC 17025 Implementation
Management Requirements
Technical Requirements
ISO/IEC 12207: Systems and software engineering — Software life cycle Processes
• Quality Management Process
• Software/ System Qualification Testing Process
• Software Validation Process
• Measurement process
• Quality Mng process
Approval as per ISO/IEC 17025
ISO/IEC 29119: Software and systems engineering — Software testing
• Organizational process
• Test management process
• Test Documentation
ISO/IEC 29119: Software and systems engineering — Software testing
IEEE 1028 : Static Testing
• Concepts & Definitions
• Test Management process
• Test Documentation
• Test Techniques
ISO/IEC 25010: SQuaRE — System and Software quality models
• Quality in Use model
• Product Quality Model
ISO/IEC 25051 : SQuaRE – Requirements for Quality of COTS Software product and Instruction for testing
• Software product requirements
• Test documentation requirement
• Conformity evaluation requirements
Note : For some of the ISO/IEC 17025 requirements, the ISO/IEC standards referred above may be applied for clarity and better interpretation


ORGANIZATION CHART
STQC Directorate, New Delhi
< Director General >
STQC IT Services, New Delhi
< CEO >
STQC IT Services, Bangalore
< Director >
Secretariat
scope of accreditation
Customer Service
< Head - Customer Service >
Quality Assurance
(Quality Manager)
Software Quality Training
<Head: Training>
Software Testing / Evaluation
<Head Test Operations>
(Technical Manager)
Admin. and Accounts
< Adm. –Acc Officer>
e-GCA Project
<Head e-GCA>
ISMS and ITSM Services
<Head Information security >
Test Co-coordinator
Functional Test & Compatibility
< Test Manager >
Performance Test
< Test Manager >
Usability Test
< Test Manager >
Application Security Test
< Test Manager >
Reliability Testing
< Test Manager
IV&V
< Test Manager >
Code Review
System Administration
< Test Manager >
<Test Engineers>

Personnel: Qualification and Competence

Designation	Job Profile	Academic qualification	Experience in years
Test Engineer	Developing test design specifications, test cases, test suits etc.	B Tech, B E, MCA or equivalent Diploma in IT/CSc/ Electronics /Communication	- min. 2 years;
Test Lead / Test Manager	Developing Test Plan, Test Methods, review of test design specifications, test cases, test suits etc.	B Tech, B E, MCA or equivalent, Diploma in IT/CSc/ Electronics / Communication CSTM/ISTQB certification or equivalent is desirable;	min. 2 years min. 5 years;
Technical Manager/ Test Strategist	Overall Responsibility of Technical operations Establishes, and ensures conformance to, the Organizational Test Process	B Tech, B E, MCA or equivalent, Diploma in IT/CSc/ Electronics /Communication; CSTM/ISTQB certification or equivalent is desirable,	min. 5 years min. 10 years
Quality Manager	Overall Responsibility of QMS activities of laboratory	B Tech, B E, MCA or equivalent, Diploma in IT/CSc/ Electronics /Communication	min. 5 years min. 10 years

ACCREDITATION – A SYMBOL OF TECHNICAL COMPETENCE

Bibin Philip, Quality Officer
NABL, New Delhi
17 jan 2014

OVERVIEW

- Terminologies
- Laboratory Accreditation or ISO 9001 Certification
- Why Use an Accredited Laboratory?
- Why Become an Accredited Laboratory?
- Benefits of Accreditation
- International Scenario of Laboratory Accreditation
- NABL- The National Accreditation Board

CERTIFICATION

Procedure by which a third party gives a written assurance that a product, process or service conforms to specified requirements.

(ISO/ IEC 17000: 2004)

- **Assures the customer that the organisation has in place an effective quality or environmental management system**
- **Does not confer technical credibility of the test result**

ACCREDITATION

Third-party attestation related to a conformity assessment body conveying formal demonstration of its competence to carry out specific conformity assessment tasks

(ISO/ IEC 17000: 2004)

- **Assures the customer that the procedures and test results are technically valid**
- **Recognizes the technical competence of laboratory staff**
- **Endorses that the laboratory operates the management system effectively**

ISO 17025
ACCREDITED LABORATORY

Laboratory Accreditation or ISO 9001 Certification?

- This standard (ISO 9001) is widely used in manufacturing and service organisations to evaluate their system for managing the quality of their product or service.
- Whilst effective as a management evaluation tool, ISO 9001 does not evaluate the technical competence of a supplier. This means that the evaluation of a supplier against ISO 9001 does not assure you or your customers that the test, or calibration data are accurate and reliable.

Accreditation is more desirable for a laboratory

Why use an Accredited Laboratory?

- **What should you consider when choosing a laboratory?**
  When selecting a laboratory to fulfil your testing, calibration or measurement needs, you need to be sure that they can supply you with **accurate and reliable** results.

  The technical competence of a laboratory depends on a number of factors including:
- the qualifications, training and experience of the staff
- the right equipment - properly calibrated and maintained
- adequate quality assurance procedures
- proper sampling practices
- appropriate testing procedures
- valid test methods
- traceability of measurements to national/international standards
- accurate recording and reporting procedures
- suitable testing facilities

WHY IS A LABORATORY'S TECHNICAL COMPETENCE SO CRITICAL TO YOU AS A MANUFACTURER, SUPPLIER, EXPORTER OR CUSTOMER?

- Minimise risk
- Avoid expensive retesting
- Enhance your customers' confidence
- Reduce costs and improve acceptance of your goods overseas

Why become an Accredited Laboratory?

- A recognition of testing competence
- A benchmark for performance
- A marketing advantage?
- International recognition for your laboratory

Why become an Accredited Laboratory?

- Better control of laboratory operations
- Improves staff confidence and enhances business
- Enhanced customer confidence and satisfaction
- Reliability of data for R&D
- Insurance companies can rely on test results
- Ensures better support in the event of legal cases
- Provides traceability in measurements to national standards
- Provides global equivalence
- Saving of time & money due to re-testing

International scenario of Laboratory Accreditation

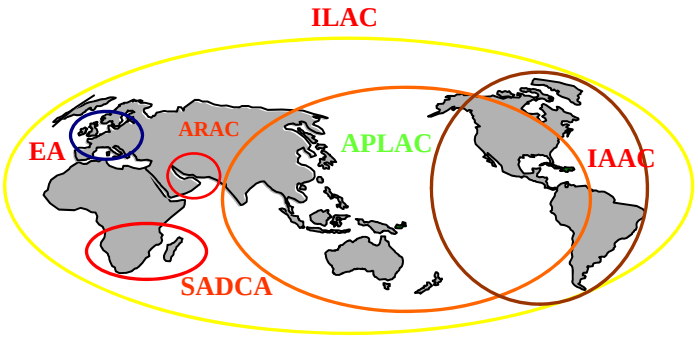
LABORATORY ACCREDITATION- MILESTONES

War time test house scheme	Australia	1943
NATA	Australia	1946
Telarc	New Zealand	1973
STP	Denmark	1973
NVLAP	USA	1976
ILAC – International Conference		1977
A2LA	USA	1978
ISO/IEC Guide 25 - Requirements for Competence		1978
RNE	France	1979
CSCP	Canada	1980
NCTCF	India	1981
NAMAS	UK	1981
HOKLAS	Hong Kong	1985
EA - European Co-operation		1987
APLAC - Asia Pacific Co-operation		1992
NABL	India	1992

MRA DEVELOPMENTS

- Australia - New Zealand Laboratory MRA - 1981
- Australia and New Zealand with UK, Sweden, Netherlands.
- EA multilateral MRAs (Australia, NZ, HK, Singapore, USA)
- ILAC multilateral MRA joining EA and APLAC and other regions – 1996
- APLAC multilateral MRA - 1997

THE INTERNATIONAL PICTURE



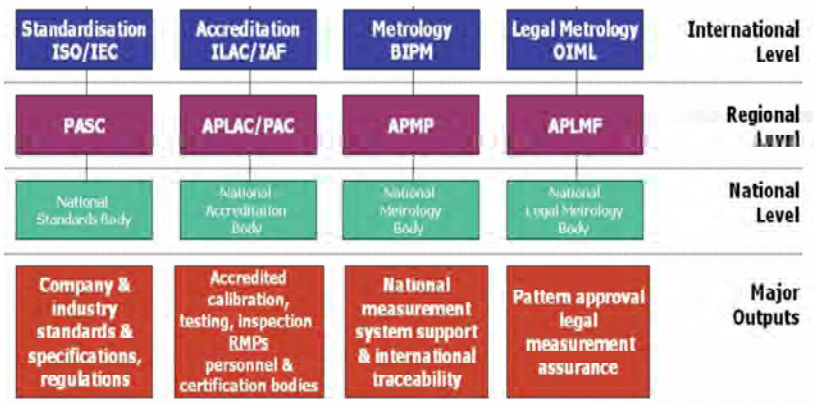
GLOBAL ACCEPTANCE OF REPORTS

**MRA facilitate acceptance of test/ calibration results between economies which MRA partners represent. **

Test reports issued by an NABL accredited laboratory is considered equivalent to those issued by ILAC/APLAC MRA partners.

Global MRA has network of ~40,000 Accredited labs from 60 economies.

STANDARDS AND CONFORMANCE INFRASTRUCTURE



NATIONAL ACCREDITATION BOARD FOR TESTING AND CALIBRATION LABORATORIES (NABL)

NABL

➢NABL is an autonomous body under the Department of Science & Technology (DST), Govt. of India and is registered under the Societies Act, 1860.

➢ NABL has been established with the objective to provide Government, Industry Associations and Industry in general with a scheme for third-party assessment of the quality and technical competence of testing and calibration laboratories.

NABL

OBJECTIVES OF NABL

- Promote & Implement Accreditation system for laboratories
- Provide timely accreditation services to laboratories
- Create awareness on Laboratory Accreditation
- Maintain data-base for Assessors & Monitor Performance
- Undertake training programs for Assessors & NABL Staff
- Operate mechanisms for Complaints and Appeals
- Maintain linkages with ILAC & APLAC through meetings
- Promote MRA with other ABs for acceptance of test reports

NABL

NABL grants accreditation

- to testing & calibration laboratories as per ISO/IEC 17025
- to medical laboratories as per ISO 15189.
- To proficiency testing providers as per ISO/IEC 17043

- NABL operates its own system as per ISO/IEC 17011.

ACCREDITATION SCOPE OF NABL

Testing Laboratories

- Biological
- Chemical
- Electrical
- Electronics
- Fluid-Flow
- Mechanical
- Non-Destructive Testing
- Optical
- Photometry
- Radiological
- Thermal

Calibration Laboratories

- Electro-Technical
- Mechanical
- Radiological
- Thermal
- Optical
- Fluid-Flow

ACCREDITATION SCOPE OF NABL

Medical Laboratories

- Clinical Biochemistry
- Clinical Pathology
- Haematology
- Microbiology
- Serology
- Histopathology
- Cytopathology
- Genetics
- Nuclear Medicine (In-vitro Only)

Proficiency Testing Providers

- Testing
- Calibration
- Medical
- Inspection

NABL

RECOGNITION BY GOVERNMENT & REGULATORS

- *CGHS and Government Hospital Laboratories*
- *Bureau of Energy Efficiency (BEE)*
- *Food Safety and Standards Authority of India*
- *Central Electricity Authority (CEA)*
- *Agricultural & Processed Food Products Export Dev. Authority (APEDA)*
- *Telecom Engineering Centre (TEC)*
- *Central Pollution Control Boards (CPCB)*
- *Export Inspection Agency (EIA)*
- *Tea Board, Coffee Board, Spices Board*
- *Judiciary also relies on accredited forensic laboratories*

INTERNATIONAL RECOGNITION OF NABL

- NABL is signatory to Asia Pacific Laboratory Accreditation Co-operation (APLAC) Mutual Recognition Arrangements (MRA) and International Laboratory Accreditation Co-operation (ILAC) MRA since 2000.
- NABL was evaluated by APLAC in 2000,2004,2008 and 2012 and current MRA valid till 2016

ilac-MRA

INTERNATIONAL RECOGNITION OF NABL

- NABL has been recognized as approved accreditation body by **Environmental Protection Agency (EPA) USA** for it Energy Star labeling scheme
- NABL has also been recognized by **The LED Lighting Facts , USA** as approved accreditation body. NABL is the first Accreditation Body outside USA to get such a recognition.

ENERGY STAR

LED lighting facts® A Program of the U.S. DOE

NABL ACCREDITED LABORATORIES

Govt. Department Laboratories (approx 200)

1. Department of Atomic Energy
2. Ministry of Agriculture
3. Ministry of Chemicals & Fertilizers
4. Ministry of Commerce & Industry
5. Ministry of Communications & Information Technology
6. Ministry of Consumer Affairs & Public Distribution
7. Ministry of Defence
8. Ministry of Environment & Forests
9. Ministry of Heavy Industries & Public Enterprises
10. Ministry of Home Affairs
11. Ministry of Petroleum & Natural Gas
12. Ministry of Power
13. Ministry of Small Scale Industries
14. Ministry of Textiles
15. Council of Scientific and Industrial Research (CSIR)

CUSTOMERS

Private Organization Laboratories

1. SGS India Pvt. Ltd.,
2. TUV Rehinland Pvt Ltd
3. BVCPS India Pvt. Ltd
4. Intertek India Pvt. Ltd,
5. UL India Pvt. Ltd.
6. UltraTech Cement Limited.
7. Birla Cement Works
8. Larsen and Toubro Limited
9. Raymond Limited
10. Godfrey Philips India Limited
11. Sundaram Auto Components Ltd
12. Whirlpool of India Limited
13. Blue Star Limited, Chennai
14. Mahindra & Mahindra Ltd

CUSTOMERS

Private Organization Laboratories

- *Torrent Power Ltd.*
- *Maruti Udyog Ltd.*
- *TATA Power/TISCO/TATA Refractories / TATA Steel*
- *Reliance Industries Ltd.*
- *HCL ltd.*
- *GE India Technology Centre*
- *TUV Sud South Asia Pvt. Ltd.*
- *Hindustan Coca-Cola Beverages Pvt. Ltd.*
- *ITC R&D Centre*
- *Robert Bosch Engineering Solutions Ltd*
- *MICO Application Centre (MICO Bosch Group)*
- *MRF – R&D Corporate Technical*

CUSTOMERS

Private Organization Laboratories

- *SRL Ranbaxy Limited*
- *Dr. Lal Path Labs Pvt., Ltd.*
- *Max Labs 24X7, Max Super Speciality Hospital*
- *Apollo Gleneagles Hospitals*
- *Wockhardt Laboratory Services*
- *TATA Memorial Hospital*
- *B. M. Birla Heart Research Centre*
- *Reliance Life Sciences Pvt. Ltd.*
- *Manipal Acunova – Central Reference Laboratory*
- *Sitaram Bhartia Institute of Science & Research*
- *Sir Ganga Ram Hospital, Clinical Laboratory Services*
- *Metropolis Health Services (India) private Limited*

CUSTOMERS

Cross Border Laboratory Accreditation

1. SGS Bangladesh Ltd, Dhaka, Bangladesh
2. Bureau Veritas Consumer Products Services Ltd., Dhaka, Bangladesh
3. Textile Training & Services Centre – Textile Testing Laboratory, Sri Lanka
4. Bureau Veritas Consumer Products Services (Lanka) Ltd., Sri Lanka
5. SGS Lanka Pvt. Ltd, Colombo, Sri Lanka
6. Zest Laboratories Pvt. Ltd. Nepal
7. TUV SUD Bangladesh Pvt. Ltd., Bangladesh
8. CFL, Department of Food Technology & Quality Control, Nepal
9. TUV Rheinland Bangladesh Pvt. Ltd. Bangladesh

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