### **Estimation of Measurement Uncertainty in Test and Calibration**

# FQF BETHEBEST

### Organized by

### FICCI QUALITY FORUM

Apr 21-23, 2014





### 1. Introduction

The purpose of measurement is to determine a value of quantity of interest or the measurand. However, when any measurement is made, the measurement process involves the use of standards, work piece, instruments, persons, procedure and environment.

For reliable measurement process, it is necessary to quantify this inherent variation, which is known as the uncertainty of measurement. It is, thus, necessary to not only to understand what measurement uncertainty is, but to learn how to estimate the same and consider its implication in decision based on measurement.

According to clause 5.4.6.2 of ISO/IEC 17025, "Testing laboratories shall have and shall apply procedures for estimating uncertainty of measurement". Further, as per cl. 5.5.1.4 of ISO 15189:2012 Standard on accreditation of medical laboratories, "The laboratory shall determine measurement uncertainty for each measurement procedure in the examination phase used to report measured quantity values on patients' samples. The laboratory shall define the performance requirements for the measurement uncertainty of each measurement procedure and regularly review estimates of measurement uncertainty".

### 2. Course Objectives

The main objective of this course is:

- ✓ To understand the concept of measurement uncertainty and its implication in measurement
- ✓ To learn how to estimate the uncertainty associated with measurement results of tests & calibration.
- ✓ To practice the estimation techniques through a workshop with live examples so that a participant can perform the calculation at his/her work station.

### 3. You should attend this course if,

- ✓ You want to understand the concept of measurement uncertainty.
- √ You want to implement concept of measurement uncertainty in measurement procedures exercise in your testing and calibration laboratories.
- ✓ You want to learn to estimate uncertainty associated with measurement results of test and calibration.
- ✓ You want to practice estimation techniques for improving efficiency of your laboratory processes
- ✓ You are looking to expand your skills in the area of good laboratory practices.

### 4. Course Material

Course kit comprising detailed course material with several worked out examples which will help participants in estimation of Measurement Uncertainty in their tests.

### 5. Methodology & Certification

A judicious mix of class room presentations, exercises, group discussion, case studies and hands-on practice will be used. Participants will be encouraged to relate the learning to live situations.

Participants who successfully complete the continuous assessment during the course and also the written examination conducted on 3<sup>rd</sup> day of the course will be issued a certificate by FICCI.

### 6. Course organisation, schedule & registration procedure

The course is of non-residential nature. It is of 3 days duration and is conducted from 0900 hrs to 1730 hrs daily for the first three days & on the third day the course finishes at 1700 hrs after the written examination. Tea/Coffee and working lunch is provided by the organizers.



## The fee for the course is Rs 11,850/- per participant plus 12.36% Service Tax (Total Rs 13,315/-)

For joining the course, participants are required to send their full particulars (name, designation, email, postal address, and phone number) along with fee by RTGS or cheque payable at Delhi in favour of "FICCI QUALITY FORUM" at the address mentioned under Course Venue.

### 7. About our Lead Faculty

Our Lead faculty of this course Mr. Basudev Bhattacharya has rich experience of 43 years in the field of designing, functioning, & managing testing laboratories. He was one of the founder members of Pilot Test House of the Government of India, Ministry of Commerce, a premier test and calibration centre for testing export product from the country.

Mr Bhattacharya was trained on Laboratory Management in UK in 1988 under the Indo-EEC Co-operation. He has been an International consultant in the field of laboratory accreditation on behalf of International Trade Centre; a Geneva based UN Agency. He was Chairman of Technical Committee on Photometry of NABL and member of the NABL technical committees on Clinical & Food Testing Laboratories.

He has presented and published more than 30 papers on a variety of technical subjects in National and International Journals, seminars and conferences. He has conducted more than 150 in-house workshops and training programmes on LMS in India, Bangladesh, Mauritius, Dubai, Abu Dhabi & Kuwait, and has trained more than 2000 persons. He has been providing auditing services to accredited laboratories and certified organizations as per ISO/IEC 17025, ISO 15189 & ISO 9001 Standards. and has conducted more than 75 such audits.

He has also provided LMS implementation support to 13 laboratories in different disciplines (viz. Chemical, Clinical, Mechanical, Electrical testing etc and Calibration of Mass-Dimension-Thermal-Pressure which have successfully achieved NABL accreditation.

### 8. About FICCI Quality Forum

FICCI Quality Forum (FQF) is a specialized division of Federation of Indian Chambers of Commerce and Industry (FICCI) set up with objective to sharpen the competitive edge of Indian Industry. FQF provides training, consultancy and research services focused on enhancing the quality quotient of clients and partner organization.

For the past 20 years, FQF is providing training on various ISO management systems and has a pool of highly competent & experienced trainers to conduct training courses.

FQF has collaboration arrangements with Nigel Bauer and Associates, UK for providing IRCA, UK approved Auditor/Lead Auditor training courses on ISO 9001 Quality Management System (QMS) ISO 14001 Environment Management System (EMS), ISO 22000 Food Safety Management System (FSMS) and Occupational Health and Safety Management System (OHSAS) 18001 standards. A summary of feedback given by past participants of these courses is included in this brochure.

In addition we also provide training on Six Sigma Green and Black belt certification, and Project Management. We also provide consultancy support on effective implementation of above management systems including LMS leading to certification/accreditation.

### 9. Course Dates

Apr 21-23, 2014

### 10. Course Venue

Federation of Indian Chambers of Commerce & Industry (FICCI),

Federation House,
1 Tansen Marg, Near Mandi House
New Delhi –110001, India

For further details & to reserve your seat, please contact:

Mritunjay Kumar **T: +**91-11-2348 7356 M: +91 - 99111 64501

E: fqf@ficci.com; mritunjay.kumar@ficci.com



### 11. Course Content

- Fundamentals of Measurement
- Concept of Measurement Uncertainty
- Method of Estimation of Measurement Uncertainty as per ISO Guide of 1995
- Basics of Statistics as applicable to estimation of measurement uncertainty
- Syndicated Exercise on estimation of type-A & type-B evaluations
- Case Studies involving Test situations
- Case Studies involving Calibration situations
- Model for estimation of measurement uncertainty in testing
- Model for estimation of measurement uncertainty in calibration
- Workshop on estimation of measurement uncertainty in physical and chemical measurements
- Workshop on estimation of measurement uncertainty in Calibration of common parameters
- Method of estimation of Measurement Uncertainty in Microbiology as per ISO 19036
- Syndicated Exercise on estimation uncertainty associated with quantitative microbiological measurements
- Application of Measurement Uncertainty in testing & calibration
- Asia Pacific Laboratory Accreditation Cooperation (APLAC)'s interpretation of estimation of MU in calibration & testing
- Development of a Standard Operating Procedure (SOP) for the estimation of measurement uncertainty
- Workshop on estimation of medical examination

## Some Comments from participants of previous Training Program conducted by FICCI

- The course and the manner in which it was delivered certainly deserve high grades on the scale. It has gone beyond what I had actually expected before being part of it
- After training I am able to know the basic knowledge of uncertainty. More knowledge will be with the practice. Overall experience is good
- An interesting and educative program. Got to know many parameters for the calculation of uncertainty. Would certainly try to implement in our measurement process
- I came to understand concept of uncertainty and now, I am at a level where I can do uncertainty measurement
- Learned a lot during training program via training session, group exercises, group discussion etc.
- This is the best experience for me because measurement of uncertainty training is beneficiary for me and my company. That is the wonderful job and experience of my life
- The friendly and tension free environment created by the trainers
- The training program was very effective and now I have come to know about uncertainty measurement and how and where it can be used
- Very beneficial for me. Now I am able to understand all other things which are associated with the testing, equipments and reports as an analyst
- Calmness of trainers in answering all the queries.
- The learning that comes with each course is always good but the way it is given is really important. The Course material/learning were very well disseminated and the ease with which I could learn was good. I enjoyed learning.
- I had wonderful experience which is full of knowledge and information which will not only help in my professional life but also personal life.
- Programme was very good especially both faculties were extremely good having full knowledge about the concept



### **List of Participants of Previous Courses**

Manager – Laboratory Mineral Services SS India Private Limited Mumbai Bhubaneswar Odhisa M: 078944 02743 E: Padmanava.Panda@sgs.com Mr. Suhas Salunkhe Manager – QA Tata Steel – Wire Division Mr. Suhas Salunkhe Manager – QA Tata Steel – Wire Division Mumbai Mumbai Mumbai Mumbai Maharashtra E: suhas salunke@tatasteel.com Mr. Vivek Sharma Chief Inspector Air India Ltd. Mr. Pajedra Kumar Kalra Chief Inspector Air India Ltd. Mr. 99100 22240 E: vivek.sharma1@airindia.in Mr. S. A. Salvi Lab Officer HPCL Mumbai Maharashtra Mumbai Maharashtra Mumbai Maharashtra Minerashtra	·	or Previous Courses
Mineral Services SGS India Private Limited Bhubaneswar Odhisa M: 078944 02743 E: Padmanava,Panda@sgs.com  Mr. Suhas Salunkhe Manager — QA Tata Steel — Wire Division Mumbai Maharashtra Clinical Labs Mumbai Maharashtra E: suhas. Salunke@tatasteel.com  Mr. Vivek Sharma Mr. Vivek Sharma Chief Inspector Ch	Mr. Padmanava Panda	Mr. S. G. Mahajan
SGS India Private Limited Bhubaneswar Odhisa E: Suresh.Mahajan@wires.tatasteel.com M: 078944 02743 E: Padmanava.Panda@sgs.com  Mr. Suhas Salunkhe Manager — QA Technical Manager Tata Steel — Wire Division Mumbai Maharashtra Maharashtra E: suhas.Salunke@tatasteel.com Mr. Vivek Sharma Chief Inspector Air India Ltd. New Delhi N: 093100 22240 E: yivek.sharma1@airindia.in Mr. S. A. Salvi Lab Officer HPCL Mumbai Maharashtra Myn. S. A. Salvi Lab Officer Unumbai Maharashtra Myn. S. A. Salvi Myn. S. A. Salvi Myn.	Manager –Laboratory	Head – QA
Bhubaneswar Odhisa E: Suresh.Mahajan@wires.tatasteel.com M: 078944 02743 E: Padmanava.Panda@sgs.com  Mr. Suhas Salunkhe Manager – QA Technical Manager Tata Steel – Wire Division Mumbai Maharashtra E: suhas.salunke@tatasteel.com Mr. Vivek Sharma Chief Inspector Air India Ltd. New Delhi M: 093100 22240 E: vivek.sharma1@airindia.in Mr. S. A. Salvi Lab Officer HPCL HPCL HPCL HPCL HPCL HPCL HPCL HPCL	Mineral Services	Tata Steel – Wire Division
Odhisa M: 078944 02743 E: Padmanava.Panda@sgs.com  Mr. Suhas Salunkhe Manager — QA Tata Steel — Wire Division Mumbai Maharashtra E: suhas.salunke@tatasteel.com  Mr. Vivek Sharma Mr. Vivek Sharma Mr. Oshiba Hill Mey Ogs100 22240 E: yivek.sharma1@airindia.in Mr. S. A. Salvi Lab Officer Mymbai Mr. S. A. Salvi Mr. Chief Lab Analyst HPCL Mumbai Mr. S. A. Salvi Mr. S. A. Salvi Mr. Saqib Kapadia Maharashtra Mr. Oyo2-25076138 Mr. Maharashtra Maharashtra Maharashtra Maharashtra Maharashtra Maharashtra Mindia Ldd. Mindia Maharashtra Maharashtra Maharashtra Mindia Mindia Maharashtra Mindia Maharashtra Mindia Maharashtra Mindia Mindia Maharashtra Mindia Maharashtra Mindia Mindia Maharashtra Mindia Min	SGS India Private Limited	Mumbai
M: 078944 02743 E: Padmanava Panda@sgs.com  Mr. Suhas Salunkhe  Manager – QA  Technical Manager  Tata Steel – Wire Division  Mumbai  Mahararshtra  E: suhas.salunke@tatasteel.com  Mr. Vivek Sharma  Chief Inspector  Air India Ltd.  New Delhi  New Delhi  New Delhi  New Joelin  Mr. 93200 231918 E: aittoop@its.ini.com  Mr. Air India Ltd.  New Delhi  New Delhi  New Delhi  Mr. 993100 22240 E: vivek.sharma1@airindia.in  Mr. S. A. Salvi  Lab Officer  Chief Lab Analyst  HPCL  Mumbai  Maharashtra  Maharashtra  Maharashtra  Maharashtra  Maharashtra  Maharashtra  Maharashtra  Maharashtra  Maharashtra  Ms. Manisha Dhumne  DiagnoSearch Life Sciences Pvt. Ltd  Mumbai  Maharashtra  Mumbai  Mumbai  Maharashtra  Mumbai  Mumbai  Mumbai  Maharashtra  Mumbai	Bhubaneswar	Maharashtra
E: Padmanava.Panda@sgs.com  Mr. Suhas Salunkhe Manager – QA Technical Manager Clinical Labs Mumbai Mumbai Mumbai Maharashtra E: suhas.salunke@tatasteel.com Mr. Vivek Sharma Chief Inspector Air India Ltd. New Delhi M: 093100 22240 E: vivek.sharma1@airindia.in Mr. S. A. Salvi Lab Officer HPCL Mumbai Maharashtra  Mr. R. D. Vartak Maharashtra HPCL Mumbai Maharashtra Maharashtra Maharashtra Maharashtra Maharashtra Maharashtra Maharashtra Maharashtra Maharashtra T: 022 - 25076138 Ms. Manisha Dhume DiagnoSearch Life Sciences Pvt. Ltd Mumbai Maharashtra T: 022 - 25076138 Ms. Manisha Dhume DiagnoSearch Life Sciences Pvt. Ltd Mumbai Maharashtra T: 022 - 62776300 E: manisha.ginde@diagnosearch.com Mr. R. K. Gandhi Scientific Officer Gujarat M: 9924388669 M: 9879399501	Odhisa	E: Suresh.Mahajan@wires.tatasteel.com
Mr. Suhas Salunkhe Manager – QA Technical Manager Clinical Labs Mumbai Maharashtra E: suhas.salunke@tatasteel.com Mr. Vivek Sharma Mindia Ltd. Mew Delhi M: 098200 13555 E: wivek.sharma1@airindia.in Mr. S. A. Salvi Lab Officer HPCL HPCL HPCL HPCL HPCL HPCL HPCL HPCL	M: 078944 02743	
Manager – QA Technical Manager Tata Steel – Wire Division Mumbai Maharashtra E: suhas.salunke@tatasteel.com Mr. Vivek Sharma Chief Inspector Air India Ltd. New Delhi N: 093400 23240 E: wivek.sharma1@airindia.in Mr. S. A. Salvi Lab Officer HPCL Mumbai Mumbai Maharashtra T: 022 - 25076138 Ms. Manisha Dhumne DiagnoSearch Life Sciences Pvt. Ltd Mumbai Maharashtra T: 022 - 67776300 E: manisha.ginde@diagnosearch.com Mr. R. K. Gandhi Scientific Officer Gujarat M: 9924388669 M: 9924388669 Mr. S973999501 Minosa Nanashtra Gujarat Minosa Qujarat Minosa Qujarat Minosa Quisarshipa Quisarshipa Qujarat Minosa Qujarat Minosa Quisarshipa Quisarshipa Qujarat Minosa Qujarat Minosa Qujarat Minosa Quisarshipa Quisarshipa Qujarat Minosa Qujarat Minosa Quisarshipa Quisarship	E: Padmanava.Panda@sgs.com	
Tata Steel – Wire Division  Mumbai  Maharashtra  E: suhas.salunke@tatasteel.com  Mr. Vivek Sharma  Chief Inspector  Air India Ltd.  New Delhi  M: 095400 13555  E: vivek.sharma1@airindia.in  Mr. S. A. Salvi  Ab Ohificer  HPCL  Mumbai  Maharashtra  Maharashtra  Maharashtra  T: 022 - 25076138  Ms. Manisha Dhumne  DiagnoSearch Life Sciences Pvt. Ltd  Mumbai  Maharashtra  T: 022-67776300  E: manisha.ginde@diagnosearch.com  Dr. A.H. Sharma  Scientific Officer  Gujarat  Minessons Ltd.  Mumbai  Mar. R. C. Gujarat  Mr. R. C. Gujarat  Mr. R. Gandhi  Scientific Officer  Gujarat  Minessons Ltd.  Manarashtra  Gujarat  Minessons Ltd.  Minessons	Mr. Suhas Salunkhe	Dr. Anita Ittoop
Mumbai       Mumbai         Maharashtra       Maharashtra         E: suhas.salunke@tatasteel.com       M: 098202 31918         E: aittoop@its.inj.com         Mr. Vivek Sharma       Mr. Rajendra Kumar Kalra         Chief Inspector       Chief Inspector         Air India Ltd.       Air India Ltd.         New Delhi       New Delhi         M: 093100 22240       M: 095400 13555         E: vivek.sharma1@airindia.in       E: kalra.rajinder@rediffmail.com         Mr. R. D. Vartak       Chief Lab Analyst         Lab Officer       Chief Lab Analyst         HPCL       HPCL         Mumbai       Mumbai         Maharashtra       Maharashtra         T: 022 - 25076138       T: 022 - 25076138         Ms. Manisha Dhumne       Mr. Saqib Kapadia         DiagnoSearch Life Sciences Pvt. Ltd       Corporate QA Manager         Mumbai       Allanasons Ltd.         Mumbai       Mumbai         Maharashtra       Mumbai         T: 022-67776300       Maharashtra         E: manisha.ginde@diagnosearch.com       M: 099308 11695         Dr. A.H. Sharma       Mr. R. K. Gandhi         Scientific Officer       Gigarat Pollution Control Board         Gandhinagar	Manager – QA	Technical Manager
Maharashtra E: suhas.salunke@tatasteel.com M: 098202 31918 E: aittoop@its.ini.com  Mr. Vivek Sharma Mr. Rajendra Kumar Kalra Chief Inspector Air India Ltd. New Delhi New Delhi New Delhi Ney Delhi M: 093100 22240 E: vivek.sharma1@airindia.in Mr. S. A. Salvi Lab Officer HPCL HPCL HPCL HPCL HPCL Mumbai Maharashtra T: 022 - 25076138 T: 022 - 25076138 T: 022 - 25076138 Mr. Saqib Kapadia DiagnoSearch Life Sciences Pvt. Ltd Mumbai Maharashtra T: 022 - 67776300 E: maisha.ginde@diagnosearch.com Mr. R. K. Gandhi Scientific Officer Gujarat Gujarat M: 9924388669 M: 9879399501	Tata Steel – Wire Division	Clinical Labs
E: suhas.salunke@tatasteel.com  Mr. Vivek Sharma  Chief Inspector Air India Ltd. New Delhi Mr. 093100 22240 E: vivek.sharma1@airindia.in  Mr. R. D. Vartak Lab Officer HPCL Mumbai Maharashtra T: 022 - 25076138  Mr. Saqib Kapadia DiagnoSearch Life Sciences Pvt. Ltd Maharashtra T: 022 - 67776300 E: manisha.ginde@diagnosearch.com Mr. R. K. Gandhi Scientific Officer Gujarat Pollution Control Board Gandhinagar Gujarat Mr. 9879399501  Mr. S979399501	Mumbai	Mumbai
E: aittoop@its.jnj.com  Mr. Vivek Sharma Chief Inspector Air India Ltd. New Delhi New Delhi New Delhi New Delhi New Delhi Mr. Sayou 13555 E: vivek.sharma1@airindia.in Mr. S. A. Salvi Lab Officer HPCL HPCL HPCL Mumbai Maharashtra T: 022 - 25076138 T: 022 - 25076138 T: 022 - 25076138 Mr. Saqib Kapadia DiagnoSearch Life Sciences Pvt. Ltd Maharashtra T: 022 - 27076300 E: manisha.ginde@diagnosearch.com Mr. S. A. Salvi Ms. Manisha Dhumne Mr. Saqib Kapadia Corporate QA Manager Mumbai Maharashtra T: 022 - 25076138 T: 022 - 25076138 Ms. Manisha Dhumne Mr. Saqib Kapadia Corporate QA Manager Mumbai Maharashtra Mumbai Msharashtra T: 022 - 67776300 Msharashtra T: 022 - 67776300 Scientific Officer Gujarat Pollution Control Board Gandhinagar Gujarat M: 9924388669 M: 9879399501	Maharashtra	Maharashtra
Mr. Nivek Sharma Chief Inspector Air India Ltd. New Delhi M: 093100 22240 E: vivek.sharma1@airindia.in Mr. S. A. Salvi Lab Officer HPCL Mumbai Maharashtra T: 022 - 25076138 Ms. Manisha Dhumne DiagnoSearch Life Sciences Pvt. Ltd Maharashtra T: 022-67776300 E: manisha.ginde@diagnosearch.com Mr. R. K. Gandhi Scientific Officer Gujarat Pollution Control Board Gandhinagar Gujarat M: 9924388669 Mr. Rajendra Kumar Kalra Mr. Rajendra Kumar Kalra Chief Inspector Air India Ltd. Air India Ltd	E: suhas.salunke@tatasteel.com	M: 098202 31918
Chief Inspector Air India Ltd. Air India Ltd. New Delhi New Delhi M: 093100 22240 B: vivek.sharma1@airindia.in Mr. S. A. Salvi Lab Officer HPCL HPCL HPCL Mumbai Maharashtra T: 022 - 25076138 T: 022 - 25076138 Mr. Sanshab Dhumne DiagnoSearch Life Sciences Pvt. Ltd Mumbai Maharashtra T: 022-67776300 B: manisha.ginde@diagnosearch.com Mr. R. Ghief Inspector Mire R. D. Vartak Mire Sanjoha Mire R. Sanjoha Mire R. Sanjoha Mire R. Mir		E: aittoop@its.jnj.com
Air India Ltd.  New Delhi  New Delhi  M: 093100 22240  E: vivek.sharma1@airindia.in  Mr. S. A. Salvi  Lab Officer  HPCL  Mumbai  Maharashtra  T: 022 - 25076138  Mr. Saqib Kapadia  DiagnoSearch Life Sciences Pvt. Ltd  Maharashtra  T: 022-67776300  E: manisha.ginde@diagnosearch.com  Mr. R. K. Gandhi Scientific Officer  Gujarat  Gujarat  M: 9924388669  M: 095400 13555  E: kalra.rajinder@rediffmail.com  Mr. R. D. Vartak  Chief Lab Analyst  HPCL  HPCL  HPCL  Mumbai  Mumbai  Maharashtra  T: 022 - 25076138  Mr. Saqib Kapadia  Corporate QA Manager  Allanasons Ltd.  Mumbai  Maharashtra  Mumbai  Min 099308 11695  Mr. R. K. Gandhi  Scientific Officer  Gujarat  Gujarat  Mi. 9924388669  M: 9879399501	Mr. Vivek Sharma	Mr. Rajendra Kumar Kalra
New Delhi M: 093100 22240 E: vivek.sharma1@airindia.in  Mr. S. A. Salvi Lab Officer HPCL HPCL Mumbai Maharashtra T: 022 - 25076138  Ms. Manisha Dhumne DiagnoSearch Life Sciences Pvt. Ltd Maharashtra T: 022-67776300 E: manisha.ginde@diagnosearch.com Mr. S. A. Salvi Mr. R. D. Vartak Corporate QA Manager Maharashtra T: 022-67776300 G: manisha.ginde@diagnosearch.com Mr. Saqib Kapadia Scientific Officer Gujarat Pollution Control Board Gandhinagar Gujarat M: 9924388669 M: 9879399501	Chief Inspector	Chief Inspector
M: 093100 22240 E: vivek.sharma1@airindia.in E: kalra.rajinder@rediffmail.com  Mr. S. A. Salvi Mr. R. D. Vartak  Lab Officer Chief Lab Analyst HPCL HPCL Mumbai Maharashtra T: 022 - 25076138 T: 022 - 25076138 T: 022 - 25076138 Ms. Manisha Dhumne DiagnoSearch Life Sciences Pvt. Ltd Corporate QA Manager Mumbai Maharashtra Minabai Maharashtra Mumbai Maharashtra Mumbai Maharashtra Mumbai Minabai Maharashtra Mumbai Minabai M	Air India Ltd.	Air India Ltd.
E: vivek.sharma1@airindia.in  Mr. S. A. Salvi  Lab Officer  Chief Lab Analyst  HPCL  Mumbai  Maharashtra  T: 022 - 25076138  Ms. Manisha Dhumne  DiagnoSearch Life Sciences Pvt. Ltd  Mumbai  Maharashtra  T: 022-67776300  E: manisha.ginde@diagnosearch.com  Mr. R. K. Gandhi  Scientific Officer  Gujarat Pollution Control Board  Gandhinagar  Gujarat  Mr. Saqvis Kapadia  Corporate QA Manager  Mumbai  Mlanasons Ltd.  Mumbai  Maharashtra  Mumbai  Minesai  M	New Delhi	New Delhi
Mr. S. A. Salvi Lab Officer Chief Lab Analyst HPCL HPCL Mumbai Maharashtra T: 022 - 25076138 T: 022 - 25076138 T: 022 - 25076138 Ms. Manisha Dhumne DiagnoSearch Life Sciences Pvt. Ltd Corporate QA Manager Mumbai Maharashtra T: 022-67776300 Maharashtra Mimbai Mi	M: 093100 22240	M: 095400 13555
Lab Officer  HPCL  Mumbai  Maharashtra  T: 022 - 25076138  Ms. Manisha Dhumne  DiagnoSearch Life Sciences Pvt. Ltd  Maharashtra  T: 022-67776300  E: manisha.ginde@diagnosearch.com  Dr. A.H. Sharma  Scientific Officer  Gujarat Pollution Control Board  Gandhinagar  Gujarat  M: 9924388669  Chief Lab Analyst  HPCL  HACH  HACH  HACH  HACH  HACH  HACH  HACH  HISTAR  Gujarat  Gujarat  M: 9879399501	E: vivek.sharma1@airindia.in	E: kalra.rajinder@rediffmail.com
HPCL Mumbai Maharashtra T: 022 - 25076138 Ms. Manisha Dhumne DiagnoSearch Life Sciences Pvt. Ltd Corporate QA Manager Mumbai Maharashtra T: 022-67776300 E: manisha.ginde@diagnosearch.com Mr. R. K. Gandhi Scientific Officer Gujarat Pollution Control Board Gandhinagar Gujarat M: 9924388669  HAdarashtra HPCL Mumbai Maharashtra Corporate QA Manager Allanasons Ltd. Mumbai Mumbai Maharashtra Mumbai Maharashtra Min Bei Min R. K. Gandhi Gandhinagar Gujarat Pollution Control Board Min 9924388669 M: 9879399501	Mr. S. A. Salvi	Mr. R. D. Vartak
MumbaiMumbaiMaharashtraMaharashtraT: 022 - 25076138T: 022 - 25076138Ms. Manisha DhumneMr. Saqib KapadiaDiagnoSearch Life Sciences Pvt. LtdCorporate QA ManagerMumbaiAllanasons Ltd.MaharashtraMumbaiT: 022-67776300MaharashtraE: manisha.ginde@diagnosearch.comM: 099308 11695Dr. A.H. SharmaMr. R. K. GandhiScientific OfficerScientific OfficerGujarat Pollution Control BoardGujarat Pollution Control BoardGandhinagarGandhinagarGujaratM: 9879399501	Lab Officer	Chief Lab Analyst
Maharashtra T: 022 - 25076138 T: 022 - 25076138 T: 022 - 25076138  Ms. Manisha Dhumne DiagnoSearch Life Sciences Pvt. Ltd Corporate QA Manager Mumbai Allanasons Ltd. Maharashtra Mumbai T: 022-67776300 E: manisha.ginde@diagnosearch.com Mr. R. K. Gandhi Scientific Officer Gujarat Pollution Control Board Gandhinagar Gujarat M: 9924388669 Maharashtra Gigarat Minagar Gujarat M: 9879399501	HPCL	HPCL
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DiagnoSearch Life Sciences Pvt. Ltd  Mumbai Allanasons Ltd.  Mumbai T: 022-67776300 Maharashtra E: manisha.ginde@diagnosearch.com Mr. R. K. Gandhi Scientific Officer Gujarat Pollution Control Board Gandhinagar Gujarat M: 9924388669 Corporate QA Manager Allanasons Ltd.  Mumbai Mumba	T: 022 - 25076138	T: 022 - 25076138
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MaharashtraMumbaiT: 022-67776300MaharashtraE: manisha.ginde@diagnosearch.comM: 099308 11695Dr. A.H. SharmaMr. R. K. GandhiScientific OfficerScientific OfficerGujarat Pollution Control BoardGujarat Pollution Control BoardGandhinagarGandhinagarGujaratGujaratM: 9924388669M: 9879399501	DiagnoSearch Life Sciences Pvt. Ltd	Corporate QA Manager
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E: manisha.ginde@diagnosearch.com  M: 099308 11695  Dr. A.H. Sharma  Mr. R. K. Gandhi  Scientific Officer  Gujarat Pollution Control Board  Gandhinagar  Gujarat  M: 9924388669  M: 099308 11695  Mr. R. K. Gandhi  Scientific Officer  Gujarat Pollution Control Board  Gujarat Pollution Control Board  Gandhinagar  Gujarat  M: 9879399501	Maharashtra	Mumbai
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Gujarat Pollution Control Board Gandhinagar Gujarat M: 9924388669  Gujarat Pollution Control Board Gandhinagar Gujarat M: 9879399501	Dr. A.H. Sharma	Mr. R. K. Gandhi
Gandhinagar Gujarat M: 9924388669 Gandhinagar Gujarat M: 9879399501	Scientific Officer	Scientific Officer
Gujarat       Gujarat         M: 9924388669       M: 9879399501	Gujarat Pollution Control Board	Gujarat Pollution Control Board
M: 9924388669 M: 9879399501	Gandhinagar	Gandhinagar
	Gujarat	Gujarat
	M: 9924388669	M: 9879399501
E: dr_avnesh@rediffmail.com E: rkgandhi88@rediffmail.com	E: dr_avnesh@rediffmail.com	E: rkgandhi88@rediffmail.com



Mr. Viral Brahmbhatt	Mr. Swetesh John
Sen. Scientist	Sen. Scientist
Gujarat Environment Management Institute	Gujarat Environment Management Institute
Gandhinagar	Gandhinagar
Gujarat	Gujarat
M: 090990 69897	M: 8000693533
E: viral_feb15@ymail.com	E: swetesh1988@gmail.com
Mr. P. N. Wasnik	Mr. Ajay Kumar Garg
QA Officer	Q.A.Deptt
Textile Committee	Minda Industries Ltd.
Mumbai	Gurgaon
Maharashtra	Haryana - 122004
	T: 0124-2290693
	M: 09810665917
	E: ajaygarg@mindagroup.com
Mr. Samresh Kumar	Mr. Vijay Kumar Bhalwal
Sr. Testing Engineer	Technical Officer
Atharva Laboratories Pvt. Ltd.	Isolloyd Engineering Technologies Ltd
Greater Noida	Solan -174101
Uttar Pradesh	Himachal Pradesh
M:09990363651	M: 094187 33897
E: samresh@live.com	
Mr. Nek Mohammad	Ms. Akanksha Srivastava
Technical Officer	Manager – Quality Assurance
Isolloyd Engineering Technologies Ltd	FICCI Research and Analysis Centre
Solan -174101	New Delhi-110077
Himachal Pradesh	T: 011 45333500 Ext. 510
M: 094592 97168	E: akanksha.srivastava@fraclabs.org
Mr. Prabhat Soni	Ms. Shalini Tyagi
Section In charge (Microbiology)	Quality Manager – Food Labs
Advance Research & Analytical Services	Intertek India Ltd.
Ghaziabad	Gurgaon
Uttar Pradesh - 201009	Haryana
M: 099905 20980	T: 0124 4840600 Ext. 611
E: prabhatsoni29@yahoo.in	M: 096506 01103
	E: shalini.tyagi@intertek.com
Ms. Rashmi Gupta	Mr. Anshul Sharma
FICCI Research and Analysis Centre	Food & Drug Lab
New Delhi 110077	Spectro Analytical labs Ltd.
M: 098735 68817	New Delhi
E: rashmilaharia@gmail.com	M: 083759 50184



Ms. Renu Singh	Ms. Aruna Singh
Section In charge – Microbiology Lab	Section In Charge – Wet Chemical Lab
Intertek Pvt. Ltd.	Intertek Pvt. Ltd.
Gurgaon 122016	Gurgaon 122016
Haryana	Haryana
M: 098916 56255	M: 099719 04389
E: renu.singh@intertek.com	E: aruna.singh@intertek.com
Mr. Abhimanyu Kumar	Mr. Puneet Bhardwaj
Dy. Manager – Polymer & Rubber Lab	Head – BV Plus Services
Spectro Analytical labs Ltd.	Bureau Veritas India
New Delhi	Noida -201301
M: 098717 12161	Uttar Pradesh
E: abhimanyu_sharma53@rediffmail.com	M: 9999812138
	E: <u>puneet.bhardwaj@in.bureauveritas.com</u>
Ms. Shipra Jain	Mr. V. R. Anand
Head – QA & HSE	Asst. Dir. (Ballistics) & DQM
Bureau Veritas India	Forensic Science Laboratory
Noida -201301	Delhi-110085
Uttar Pradesh	M: 090133 00038
M: 088001 98061	E: vijay1973anand@gmail.com
E: shipra.jain@in.bureauveritas.com	
Mr. Anirban Ghosh	Dr. Sandeep Kumar Mourya
Cairn India Ltd.	SSA (Physics)
Gurgaon	Forensic Science Laboratory,
Haryana - 122054	Delhi-110085
M: 088263 92072	M: 088008 23387
E: anirban.ghosh@cairnindia.com	E: sandeepmourya07@rediffmail.com
Mrs. Kavita Goyal	Mr. Libin Kumar K.V.
SSO (Chemistry)	Section In charge – RSTS Lab
Forensic Science Laboratory,	SGS India (P) Ltd.
Delhi-110085	Gurgaon- 122015
M: 099680 93569	Haryana
E: kavita goyal74@yahoo.co.in	M: 099992 63650
	E: itslibin@gmail.com

FACULTY	For any query or reserving your seat for other	
	programs, please contact	
Mr. B. Bhattacharya	Mr. Mritunjay Kumar	
Consultant - FQF	Deputy Director – FICCI Quality Forum	
M:+91-9869354407	M: +91 – 9911164501	
	T: +91 11 2348 7356	
E: basudev44@gmail.com	E: Mritunjay.kumar@ficci.com	

