ISO 17025 Laboratory Instrument Calibration Technique

Introduction

The course begins with a broad overview of the Metrology discipline, and defines some common terms. It next introduces the statistical concepts that form the cornerstones of modern metrology and calibration. The students are then exposed to statistical management concepts such as Statistical Process Control (SPC) and the Measurement Assurance Process (MAP). The course then reviews in considerable depth the requirements imposed by ISO standard 17025. Its impact on all aspects of calibration laboratory management is analyzed clause by clause. The final sections of the course deal with laboratory facilities, equipment and calibration logistics, as well as reporting requirements, ESD control, equipment handing and safety considerations.

Who Should Attend?

Lab Managers and Supervisors, Chemists and Technicians, Health & Safety and Environmental Professionals, staff responsible for managing hazardous wastes, staff responsible for contamination issues, Laboratory Technicians, Analytical Laboratory Professionals, Laboratory Staff, Superintendents, Supervisors, Engineers, Chemists, Analysts, anyone involved in standards and calibration laboratories and for others who want a clear understanding of the special requirements that must be met by managers and other personnel in standards and calibration work

Course Objectives:

By the end of this course delegates will be able to:

- Review the requirements imposed by ISO standard 17025
- Review the impact on all aspects of calibration laboratory management is analyzed clause by clause

Course Outline

Relationship of Metrology and Calibration to Quality System

- Methodologies for a calibration program
- Metrology glossaries
- International definitions
- ISO 9000 quality system
- Error, accuracy, precision
- Measurement uncertainty
- Measurement process
- Calibration control system
- Measurement Assurance Process (MAP)
- Statistical Process Control (SPC)
- Check Standards in SPC
- Standard reference materials
- Quality /reliability goals
- Risk management
- Calibration system-purpose and justification

Calibration System

- Government agencies
- History of calibration requirements
- Conforming to international definitions
- International standards
- ISO standard 17025 requirements: management system
- Laboratory procedures
- Corrective and preventive action
- Management review
- Laboratory personnel job description
- Test and calibration methods
- Estimation of measurement uncertainty
- Measurement traceability
- Sampling
- Reporting of results
- ISO 9000-accreditation, certification, registration
- Proficiency testing

Calibration Program and Metrology Management

- Program manager
- Technical management
- Quality manager
- Quality Systems considerations
- Documentation requirements
- Calibration control system
- Quality / calibration manual

New Concepts in Metrology

- Measurement uncertainty
- Measurement uncertainty evaluation

- Standard uncertainty
- Expanded uncertainty
- Glossary
- Error sources
- Type A and type B error evaluation
- Confidence levels
- Measurement uncertainty summary
- Measurement assurance
- Inter-laboratory testing, calibration
- Inter-laboratory comparison (ILC)

Administrative Considerations in Metrology

- Metrology personnel: technicians, engineers, management and support
- Metrology document types
- Test and calibration-procedures

Tools of the Metrology Trade

- Calibration logistics
- Calibration intervals
- Calibration status
- Exclusions from calibration system
- Tamper proof sealing
- Recall system
- Reverse traceability

Reports, Records, Safety and Equipment Handling

- Calibration reports: requirements
- Calibration records
- ESD control in the calibration laboratory

- Safety considerations
- Precision equipment handling/storage
- Preventive maintenance (PM)
- Ethical considerations