



2019 NCSL INTERNATIONAL
WORKSHOP & SYMPOSIUM
August 24–29, 2019
Huntington Convention Center, Cleveland, OH
Call for Papers
Abstract Deadline March 31, 2019
Manuscript Deadline May 20, 2019

NCSL INTERNATIONAL
Serving the World of Measurement

Course Catalog Number: Ttq-1
Course Track: Torque Measurements
Course Topic: Calibration
Course Career Level: Beginner

Monday, August 26 | 8:00 AM - 12:00 PM | 1/2-Day AM (4 Hours)

**Course Title: Imagine your Torque Calibrations are not as accurate as you think they are:
Chances are they're not!**

Instructor: Henry Zumbrun, Morehouse Instrument Company, Inc.

Abstract: There are three essential components to making better torque measurements: The technicians must be competent and realize torque is more than force times length; The right equipment must be selected and with torque, it rarely is; The calibration provider must have low enough uncertainties to meet your needs. The course will cover the problems with torque measurements, torque traceability, and the calibration hierarchy, types of torque standards, the sources of measurement error, and torque wrenches and the proper handling techniques. We will have "hands-on" demonstrations of how to use a torque wrench. Anyone participating will have enough information to correct problems and start making better torque measurements. All participants will receive a USB drive with several helpful documents and excel sheets. Included will be a risk calculator and an uncertainty template which will simply calculating calibration and measurement capability (CMC) for both force and torque scopes of accreditation.

Learning Objectives:

1. Understand what torque is and know how uncertainty is calculated in regard to the measurement hierarchy.
2. Identify torque standards and measurement errors.
3. Torque wrench types and proper handling.

Instructor Curriculum Vitae (CV): Henry is President of Morehouse Instrument Company. We create a better, safer world by helping companies improve their force and torque measurements. The key to our success is offering products with the lowest measurement uncertainties available. Ultimately, this helps our customer base make more accurate measurements, which saves on cost, reduces risk, and increases quality. My passion is to help any lab make better force measurements. I want to explain error sources and how to use this knowledge so that you can make better measurements. There are so many labs out there who take short cuts, or do not follow the proper guidelines and they may be calibrating your equipment. This equipment may then be responsible for bridges collapsing, product failures, or satellites exploding. These measurements are serious and we welcome anyone wanting to make better measurements into this, or any other class.