

Advanced Laboratory Solutions Consulting, LLC

Laboratory Manager Concerns

Budget – personnel is top!

Data Integrity

Customer Satisfaction

New Markets/Capabilities

Did You Know?

Personnel replacement
can cost 20-30% of a
job's total salary!

Training Helps Retain Your Valuable Employees!

Inadequate training
accounts for 40% of
resignations.

94% of employees state they
would stick with an
organization longer if it
invested in their training.



this issue

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The Importance of Training

As a former Laboratory Manager, I understand the difficulties in providing training to laboratory personnel while still covering the daily responsibilities of the laboratory and many times, working with limited training and travel budgets, both of which are routinely the first to be cut in any budgetary constrictions implemented.

Similarly, I understand the importance of training and development of existing personnel's skills to not only advance laboratory capabilities by improving proficiency but to introduce personnel to new/alternative methodologies and instrumentation. Advances are routinely made in analytical techniques and a laboratory can soon become lacking in capabilities that may be required for new standards and/or client methods and specifications.

Beyond the benefits of training personnel to advance laboratory operations, laboratory management must consider the importance employees put on training for their own career advancement. According to [TeamStage](#), 68% of workers consider training and development opportunities an organization's most important policy, with inadequate training accounting for 40% of resignations. For Millennials, 87% state training and development is a primary concern, with 59% claiming it is an important aspect to consider before applying for a position and for overall job satisfaction. And with almost 3 billion people, or around 30% of the world population, being Gen Zs and Millennials, their concerns certainly influence the market ([Talentvis](#)).

Of course, budget constraints tempt management to dramatically reduce and/or eliminate personnel training, but the importance to both employee and employer cannot be overstated. Personnel replacement can cost 20-30% of a job's total salary, and with today's phenomenon of the "Great Resignation" and swapping jobs for increased benefits ([Psychology Today](#)) it is important more than ever to retain valuable employees, 94% of whom state they would stick with an organization longer if it invested in their training ([TeamStage](#)).

[Medusa Analytical](#) provides advanced analytical training options for laboratory management to maximize the training available to employees at minimal costs. By providing training at or near a client site, the time taken for travel by the employee is reduced or eliminated and the time from the laboratory is minimized. Custom tailoring a training program to directly meet the current and future needs of the lab reduces the generality of training and maximizes the effectiveness of advancing laboratory capabilities and expanding personnel skills.

[Advanced Laboratory Solutions Consulting, LLC \(ALSC\)](#) is proud to partner with Medusa Analytical.

[Medusa General Training \(website-editor.net\)](#)

Consistent Measurement Results

The International Vocabulary of Metrology (VIM) defines metrological traceability as "property of a measurement result whereby that result can be related to a reference through a documented unbroken chain of calibrations, each contributing to the measurement uncertainty."

What does this mean in layman's terms? An instrument cannot be "traced", only the result from the instrument can be. But traceability of the measurement result requires a reference with a stated measurement uncertainty that extends the hierarchy of standards used in calibration of the instrument.

Further, analyses must be completed using documented and accepted procedures and proof of competence of the laboratory, usually given as accreditation, is required.

Following these guidelines, metrological traceability results in an unbroken chain of calibrations and measurements referring to the reference with uncertainty calculated at each step and ending at a measurement result as being "traceable".



Metrological Traceability

Required by standards including ISO 9001, ISO 17025 and more.

Whether providing production/process support or completing final product analysis, it is important for a laboratory to follow quality control protocols, i.e., good laboratory practices of standard procedures and reference materials. Laboratories often use In-House reference materials prepared by a member of the laboratory with one or more property value(s) intended for internal laboratory quality control. However, In-House reference materials can prove difficult for establishing traceability or uncertainty of a material, as records are primarily internal.

According to EuraChem, "As regulatory standards continue to increase, additional responsibility is being placed on laboratories to ensure the quality and safety of finished products. Now more than ever, traceability is a major concern. Laboratories are required to provide evidence that the reference materials being used for method validation and process controls are fit-for-purpose, homogeneous, and stable."

For industries such as oil and gas which are further guided by ASTM specifications and methods, it is required good reference materials are used when data is reported to a client but also important when analyses are completed for process/production support to ensure quality product is being produced.

DCG Partnership I, LTD. (DCG) includes this list in the production of RMs:

- Property value of interest for intended use.
- Expiry date
- Certificate listing properties of RM
- Accuracy and reliability in assigned property value.
- Confidence in measurements

A Certified Reference Material (CRM) is "a reference material characterized by a metrologically valid procedure for one or more specified properties, accompanied by a certificate that states the value of the specified property, its associated uncertainty, and a statement of metrological traceability".

DCG's CRMs are blended to the highest quality standards utilizing high quality feed stock and experienced chemists performing the blending and analysis. All Certified Reference Materials are **generally** produced at $\leq 1\%$ gravimetric uncertainty per component at the 95% confidence interval and are NIST Traceable by weight, with the gravimetric values validated by one or more accredited analytical techniques.

All DCG Certified Reference Materials include:

- Property and/or property value of interest for intended use.
- Expiry date Certificate listing properties of CRM and reliability in assigned property
- Higher level of accuracy value.
- Greater confidence in measurements
- Expanded uncertainties of the components are listed on the Certificate of Analytes
- Metrological traceability
- Accreditation logo
- Adopting the highest standards to address sources of uncertainty:

$$\sigma_{tot} = \sqrt{(\sigma_g)^2 + (\sigma_h)^2 + (\sigma_{st})^2 + (\sigma_{lt})^2}$$

σ_{tot} = total uncertainty
 σ_g = gravimetric uncertainty
 σ_h = uncertainty due to homogeneity
 σ_{st} = uncertainty due to short-term stability
 σ_{lt} = uncertainty due to long-term stability

ALSC provides sales and marketing support for DCG Partnership I, LTD for reference materials and certified reference materials.

[DCG & ALSC rev 3 \(website-editor.net\)](#)

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