

Summary of the Special Session on Credentialing
TNI Forum on Laboratory Accreditation, San Antonio, TX
Wednesday, January 11, 2023 1:00 pm Central

This special session at the winter conference was designed to inform participants about the Competency Task Force's efforts to develop a framework for a credentialing program, using the Quality Manager role as the initial certification to be offered, and to obtain feedback from the broader environmental laboratory community about the concepts presented and the advisability of proceeding to invest in creating the actual program. Jerry Parr did most of the presentation, with the Task Force Chair, Ken Brown, at his side offering both clarifications and comments throughout the session.

1. Overview of the Credentialing Initiative

The origins of this credentialing initiative were at the Strategic Planning meeting in northern Virginia in November 2019. That plan was approved in final form in mid-2020, stating the objective as follows:

- Establish a Task Force to explore and make recommendations regarding systems to document competencies for Quality Managers, Technical Managers, Laboratory Assessors, Samplers and others as appropriate.
- Note: Such documentation may involve credentialing.

Jerry explained that the initial focus was on the laboratory assessor role, but with the AB operations module in process of revision and a number of comments requiring reconsideration of the originally proposed assessor competency section, that role was set aside, and the Technical Manager role was brought forward. The Technical Manager role has always been problematic, as it doesn't necessarily match some management structures, and for small or rural labs, finding qualified personnel can be extremely difficult. A few months of discussion brought the realization that a technical expert did not necessarily have to exercise supervisory or managerial responsibilities, but only to have expertise in the analytical methods and technologies in use in a lab. After a bit more definition, that role was handed off to Quality Management Systems Expert Committee to revise and finalize in its revision of V2M1, which is underway. Both of these roles will likely be revisited once their respective modules are finalized, but that left the Quality Manager (QM) role as the best candidate for the initial credentialing.

As the Task Force began exploring how to approach the QM role, leadership worked with the Training Committee and formed a Credentialing Subcommittee comprised of both Task Force and Training Committee members. That subcommittee crafted a draft document identifying all of the laboratory operations for which a QM is responsible, and the related requirements for that aspect of operations, identifying the knowledge, skills and abilities (KSAs) needed by a Quality Manager to ensure that those requirements are met. We began to refer to this as "The KSA Document", and copies of it were distributed to all attendees at this conference session. Jerry also provided examples of how a requirement in the Standard has been translated into a KSA.

The Task Force then reviewed and refined the KSA document (and it will continue to be refined as needed) so that it defines twelve different specialties (the operational aspects) within the QM role, and identifies training courses that either exist or will be developed to support laboratorians in learning those specialties, with the intent of offering a digital badge for each specialty. Not everyone will need or want the full QM certification (which would encompass the full spectrum of operations that a QM oversees), so that the individual badges stand alone, but once an individual has all twelve badges, they can request the QM certification with no further examination needed.

The Task Force also identified some research by the US Department of Commerce that shows potential benefits of certification to both individuals and employers:

- Potential Benefits to Individual: increased recognition by peers and respect of colleagues in the profession, improved opportunities for employability and advancement, greater confidence in their professional competence, Increased professional trust from employers or the public, increased autonomy in the workplace, and better compensation and career longevity.
- Potential Benefits to Employers: qualified individuals for employment or advancement; recertification requirements for continued or enhanced competence; reduced risk of errors, accidents and/or legal liability; reduced employee turnover and increased job satisfaction; and justification for potential compensation differential.

2. The Education and Experience Option for Quality Manager

There will be an “Education and Experience Option” for credentialing, where an individual who meets minimum education and experience requirements can take a comprehensive examination based on the KSAs as identified for the twelve specialties but altogether. The Task Force proposes that this credential will be valid for three years, renewable with evidence of continuing professional development (details were provided) and a renewal fee. Holders of this Certified Quality Manager credential will be listed in a TNI database of Certified Professionals, and TNI will provide six months’ notice prior to expiration of the credential, allowing time for the individual to collect evidence of meeting the professional development requirements.

| EDUCATION | EXPERIENCE |
|---|---|
| High School | 5 years working in a laboratory, including at least one year in position |
| Associate’s, in related field | 4 years in working in a laboratory, including at least one year in position |
| Bachelor’s, in related field | 3 years in working in a laboratory, including at least one year in position |
| Master’s or higher degree in related field. | 2 years in working in a laboratory, including at least one year in position |

**Feedback on these proposed combinations of education and experience was as follows:

- The “one year in position” requirement needs clarification to state “one year working as a Quality Manager”; later in conversation, this was refined to be “one year working in a position in Quality Management, however named” or “one year as a QM, however named”
- The time “working in a laboratory” should be clarified to be “working in a laboratory performing analytical tasks”, but further discussion suggested that prior analytical experience ought not to be a requirement for a Quality Manager
- Concerns about any person with only a high school education being eligible were met with explanations that people follow different life paths into the positions and that to eliminate everyone who never completed a college degree could be perceived as racially unjust.
- Should education “in a related field” be specified, or left un-defined? Suggestion was to use the language from the Standard, and also that education in a quality-related field might not be adequate
- The level of experience required for a QM position will depend on the size and scope of the laboratory – a complex lab (full-service, offering many methods/technologies) will likely require a QM with more experience than a small lab with limited scope of accreditation
- Should the credential be “certified environmental laboratory QM professional” as title?

- One year in the position of QM might be too short also, time “in position” could (and should) include roles other than the “top” person with the QM title, if working in the quality department of a large lab
- California’s new program will create many new QA/QM positions – for a person with associate degree and less than four years’ experience, how would that work?

The examination is proposed to take 3 hours, with 150-160 hard, but not “tricky” questions, and must be proctored. A passing score is required, and areas of improvement would be identified for those that fail.

**Feedback on the examination for QM credential -- options considered are complete open book (Jerry’s preference) or else having all necessary reference materials available within the examination materials

- A former high school teacher opposed closed book tests, stating that the ability to look up information is crucial, as is knowing where to look. This individual also opposes true/false questions, preferring multiple choice or possibly “fill-in-the-blank” (with grading based on a thorough list of synonyms)
- Another commenter prefers open book, especially for individuals who might be taking a remotely proctored examination at home
- A passing score of 70% would be acceptable, although 75% should be considered. TNI training courses require a two-thirds (67%) passing score
- Yet another commenter prefers open book exams, but believes that the passing score should be raised for an open book exam, stating that quality experts are expected to answer questions that are rarely simply yes/no, but typically involve a discussion of approach and details
- Passing score should depend on the difficulty of the test, which in turn should be determined by the risk of failure in the actual position (by the credentialed employee).
- Consider asking what factors go into answering a question or what is not relevant to the answer, rather than a specific answer
- Test new questions by including them in a certain number of exams but not actually scoring them for grading purposes
- Consider adding a short interview (~20 minutes) to the exam and also consider including 2-3 questions requiring a description of how to approach the answer – these to be evaluated by QA experts
- How and by whom should references be provided for the exam?
- Another commenter favors open book, as that is a better way to assess whether a person has the baseline knowledge to perform in the position; favors the approach of the assessor training course
- Yet another favors open book, but requests that consideration be given for adults with either disabilities or test anxiety in providing examinations (and for badge tests, as well)
- A person familiar with the Association of Boards of Certification notes that their tests specify the references used to develop the questions; for this credential, the references are noted in the KSA document
- The number of questions proposed (150) for a three hour exam seems like more than a person could reasonably locate answers to, using an “open book” process, but this commenter favors open book.
- Scoring of the exam should be by topical categories, with a passing score on each of the categories (this is already in the plan, using the 12 specialist exams as categories)
- Recommend avoiding questions where there is more than one correct answer among the multiple choice (this is how Virginia’s waste water operator certification test is organized)

- A brief discussion of the proposed fee for the certification exam (\$325) suggested that it might be higher than the industry will bear, and noted that TX's fee is \$145 for testing and listing in database (type of credential not specified)

3. The Digital Badge Option for Quality Manager

For each Digital Badge, a minimum number of hours of TNI training will be required but no education or experience, and an examination (separate from course tests but with its own fee) must be passed. This exam would likely not need to be proctored, and will be shorter than the full credential. Badges will not expire in a fixed time, but if the relevant Expert Committee determines that a revision of the Standard requires refresher training, an updated badge will be awarded after that refresher training is completed. An individual possessing all twelve badges needs only to apply for the QM certification, without further examination (paying a fee yet to be determined), but each badge is a stand-alone credential in its own right. Once an individual possessing all badges is awarded the Certified Quality Manager credential, only the required professional development hours for triennial renewal are required to sustain the QM credential. There is no timeframe established for accumulation of all badges needed to apply for the QM credential.

Digital Badges are proposed as follows:

| Specialist | Minimum Hours of Education |
|---|----------------------------|
| 1. Quality Systems Specialist | 4 |
| 2. Proficiency Testing (PT) Specialist | 4 |
| 3. Data Integrity Specialist | 4 |
| 4. Records and Document Control Specialist | 4 |
| 5. Customer Service Specialist | 4 |
| 6. Measurement Traceability Specialist | 4 |
| 7. Internal Audits and Corrective Action Specialist | 4 |
| 8. Method Selection and Validation Specialist | 4 |
| 9. Laboratory Skills Specialist | 2 |
| 10. Sample Handling Specialist | 4 |
| 11. Quality Control Specialist | 4 |
| 12. Data Handling and Management Specialist | 4 |

With the framework of the credentialing program explained, Jerry proceeded to discussion of the details. An examination (a random selection from a large number of questions, requiring a passing score) would be required for the award of each digital badge, covering the KSAs related to that particular specialty. This test will be separate from whatever tests were part of the training courses, but it is presently expected that the exam questions will be the ones that comprise the collection of questions for that area of the full credential exam.

Courses completed prior to establishment of the credentialing program (legacy training) may be applied to the minimum hours, as TNI retains records of those who have taken all training to date. The badge(s) awarded upon passing each specialist exam will contain metadata specifying the date of award and the Standard in place at the time of testing.

Upon implementation of a new Standard, the relevant expert committee(s) will be asked to determine whether refresher training is needed to upgrade the badge to the latest Standard. If required and once completed, a new badge with updated metadata would then be issued. Otherwise, the digital badges themselves do not have an expiration date.

**Feedback on the digital badges was as follows:

- This route to the QM credential would bypass the education and experience requirements
- For the PT Specialist (and also the QC Specialist), the badge award should specify the field of testing; laboratory skills should also have field of testing specification (especially with relation to support equipment)
- Additional badge combinations could include data integrity with internal audits, measurement traceability with support specialist
- Corrective actions should be separated from internal audits, as they apply to many other activities also
- Information technology would fall within the data handling badge
- Additional aspects for specialist badges should include cause analysis (perhaps with corrective action?), measurement uncertainty, vendor supplied goods, and sampling
- The customer service badge could be discarded
- Every requirement in Module 2 is assigned to one of the badges now
- Courses offered right now do not necessarily match the badges or badge requirements, but additional courses will be planned to train for areas not already offered. 190 hours of training are presently available, with only 46 hours envisioned to be required (total) for all 12 badges (plus there is some overlap, that courses apply to multiple badges)
- Will there be provision for legacy individuals? No, this should not be needed, as badges will not be required by either TNI or the Standard. It is conceivable that employers might at some point require them, however
- The badge titles should match the KSA names
- Ethics and data integrity training should be pre-requisites for everything
- The cost of courses needed as well as the cost of badges (and the full credential) are “non-trivial” – are certificates and credentials useful outside of the laboratory community, and is the cost of these badges/credential comparable to their intrinsic value?
- TNI has no plans and no desire to mandate recertification for badges

4. Recertification for the QM Credential

Recertification for the Certified Quality Management Professional would be required every three years, with payment of a nominal fee plus evidence of completing twenty-four (24) Professional Development Hours (PDH). Six months’ notice would be provided to allow individuals to gather evidence of completing PDH. The following scheme is envisioned, with a proposed fee of \$225 per credential:

| Activity | PDH earned | Maximum Hours |
|--|----------------------------------|---------------|
| Training Course (Attendee) | 0.1/hour for each hour of course | No limit |
| Training Course (Instructor) | 1/hour for each hour of course | No limit |
| Continued Activity | 0.1/month | 3.6 |
| College Course | 1/credit hour | No limit |
| Meetings/Conferences | 1/day | 15 |
| Committee Officer | 2/year | 10 |
| Committee Member (Active Voting or Associate) | 0.5/year | 5 |
| Presentation at Conference | 1/presentation | 6 |

| | | |
|---|------------------|----------|
| Membership in Professional Society | 0.5/year/society | 6 |
| Proctor exam | 4 hours per exam | No limit |

Professional society memberships and conference attendance could include, for example:

| National Societies/Meetings | Regional Societies/Meetings | Local Societies/Meetings |
|---|---------------------------------------|--|
| TNI WEF and state chapters ACIL ACS ASM ASTM Standard Methods | CWEA FSEA OELa PAAEL TCEQ | Bay Area Clean Water Authority North Texas Municipal Water District |

****Feedback on Recertification**

- Fees are estimates for now; final fees will be determined by IT costs. TNI's IT
- Administrator has agreed to design and build the database architecture for a full credentialing program.
- Current fee estimates are for TNI members; non-member fees have not been considered yet
- If an individual holds more than one certificate (as the program grows), can PDH count for all certificates? And would there then be one single fee for the multiple recertifications?
- While only TNI training will be applicable to badges, any provider's training (for professionally relevant courses) will be applicable for PDH

5. Next Steps

Based on the expected favorable response, the next steps are:

- Finalize proposal
- Finalize Business Plan
- Develop any needed policies or SOPs
- Develop exams for each Badge and then the larger exam
- Develop or acquire IT systems for applications and tracking
- Elevate Task Force to Committee
- Continue to monitor pilot and develop KSAs for other Experts.
- Identify staff support, i.e., a "Credentials Coordinator"
- Launch the program for QMS Certified Professional in three phases.
 - Digital Badges only
 - QMS Certified Professional via the Digital Badge option
 - QMS Certified Professional via the education and experience option
- Timeline
 - January 2023 – Discuss plan with staff and select coordinator
 - January – March 2023 – Develop badge exams
 - March 2023 – Seek Board approval of final plan
 - April 2023 – Open Phase 1 for individuals to apply
 - Beyond April 2023 – Develop system for proctored exams and launch Phases 2 & 3
- Repeat for other Groups.

- Technical Experts
- Laboratory Assessors
- Others

6. Final Comments

The proposal presentation should be clarified to explain the intended phased roll-out of credentialing, to begin with digital badges, then progress to offering the full Certified QM Professional credential from badges and also from the experience/education option. Also, the TNI training catalog is being updated to show course content in more detail with consistent format, and also to show which badge requirement(s) a course will satisfy.

Jerry asked for a show of hands from those who favor continuing to develop the credentialing program as proposed, and the results showed considerable support for continuing. Ken asked for additional volunteers to craft the questions for badge exams, and thanked everyone for participating in the conference session.