

eQuaLearn® Newsletter

WELCOME TO THE EQUALEARN NEWSLETTER.

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Preparing for a Nadcap Audit

FOR THOSE OF US THAT HAVE BEEN THROUGH MANY NADCAP AUDITS, WE HAVE READ THE STAFF ENGINEER RESPONSE “WHY WAS THIS NOT FOUND DURING THE SELF-AUDIT OR ANY INTERNAL AUDIT?”

This is a fair response when one considers any finding obtained during a Nadcap audit should have theoretically been identified during the supplier’s self-audit. In this article we will explore some techniques that may be used to ensure a supplier has a robust internal audit system which will address all Nadcap and industry standard requirements.

Scope Establishment & Verification

As with any internal audit system, it should be designed around the entire quality system and encompass the applicable scope of accreditation. It should be recognized that, including anything out of the scope of accreditation may end up distracting the entire system away from the specific characteristics of conformance that should be accounted for. This methodology can be used within internal audit systems that are either

new to Nadcap or have maintained accreditation for some time. Let’s look at a scenario of an existing supplier attempting to improve the internal audit system regarding Nadcap Coatings accreditation. The supplier would start by examining the existing scope of accreditation. In this case, let’s say the checklists that apply are AC7109 (Audit Criteria for Coatings) & AC7109/3 (Audit Criteria for Diffusion Coatings Process). The inclusion of checklist AC7109/3 indicates that the supplier is accredited for only diffusion coatings. Furthermore, the supplier would then need to verify which section(s) of AC7109/3 apply; Pack Cementation, Above the pack, CVD or slurry spray (see exert from AC7102/3 in Figure 1).

2.1	Process Method	
	Pack Process (In Pack)/Cementation	<input type="checkbox"/>
	Above Pack Process	<input type="checkbox"/>
	Chemical Vapor Deposition (CVD)/Diffusion – applies exclusively to CVD applied aluminide coating	<input type="checkbox"/>
	Slurry Process	
	Dip	<input type="checkbox"/>
	Spray	<input type="checkbox"/>
	Brush	<input type="checkbox"/>

Figure 1

Let’s step back a minute and re-examine the logic behind this process. Some may ask “why perform all this if I already know the answers?”. Those of us closest to a process are usually those that miss the most during internal audits, this is one reason why you should not audit your own process. We assume, when we read a question, that we are “absolutely positive procedure XYZ-109 contains the required information”. That same question one was positive about suddenly becomes confusing when a Nadcap auditor states “Yes, you covered one part of the requirement, but what about this section?”. This is the point of recognizing the details of one’s Nadcap scope of accreditation; an attempt to capture each requirement while maintaining as much objectivity as possible.

Back to our scenario.

Internal Audit Systems

Now that the supplier has re-verified their scope of experience, the next step is to ensure the internal audit procedure requires internal audits to be performed using the checklists which apply to the supplier's Nadcap scope of approval. In my years I have seen this worded many ways within procedures. I would suggest this be accomplished by stating the actual applicable checklists and sections of those checklists; in this case, the less general the better. The logic behind this is to keep the focus on what applies to the supplier and eliminate any ambiguity regarding checklist(s) and checklist sections applicability for a supplier's internal auditors. Let me take this opportunity to stress that, at the minimum, use the most recent revision of the Nadcap checklists to perform the internal audit. In-other-words don't attempt to pull the data/wording/requirements for the checklists into your own checklist. Nadcap/PRI & the task group spend a lot of time on the checklists; I suggest using them as they stand. If you choose to design your own checklists for internal audits regarding Nadcap requirements than by-all-means, but I do not recommend transferring data from a Nadcap checklist to one's own checklists as data can be lost or misinterpreted during the transfer.

Thus far we have established the applicable Nadcap scope and applied that scope of requirements to the internal audit procedure. Now, we need to discuss the frequency of the internal audit using the applicable checklists. At a minimum, internal audits must be performed using the

Nadcap checklists and submitted on eAuditNet prior to the audit. It is suggested that the self-audits be performed 90-120 days prior to the Nadcap audit. Submission of the self-audit is required no less than 30 days prior to the audit start date. Based solely on this as a frequency and depending on one's merit status (or lack of) the internal audit frequency may fluctuate in this sense. Most frequently I see internal audits being performed annually for each commodity. Although, there is no need to limit the system; tailor the system to meet the needs at that moment. In other words, if internal auditors are consistently finding non-conformances, perhaps a semiannual or quarterly internal audit frequency may be better to establish the root cause of the deficiencies and get them addressed. Regardless, the internal audit process must establish scope and frequency.

Performing an Internal Audit

The performance of the internal audit can be the most challenging part of the process. Being that Nadcap audits are primarily process audits, the internal auditor must have a good understanding of the process they are auditing in order to capture and account for each requirement. Although, the internal auditor should not be directly related to the process (i.e. developer, engineer, process owner, etc.). In my experience, this challenges small, minimally staffed facilities more than large organizations that have dedicated internal auditors. There may be several ways to mitigate the issue in this case. One avenue may be hiring a subject matter expert to perform the

internal audit on-site (regardless, the supplier would still be responsible for the results of the audit). Another would be to have the internal process expert, and most likely process owner, examine the audit results closely once the audit is completed. Of course, training for internal auditors in the specific process they audit should be obtained. eQuaLearn offers training for internal audits as well as technical training in multiple commodities which may help a supplier establish a solid foundation for their internal auditors.

For those suppliers who hold current Nadcap accreditation, the audit should not be performed using previously completed checklists. There are several reasons for this. One is that the checklist may have been revised since the last audit. Another is that internal procedures may have also been revised making the previous data incorrect regarding procedure/form revision, page and paragraph reference. Another reason is that the internal audit answers the question as compliant, when in fact they were not.

During the internal audit, there may be times when a specific question is not understood. When this occurs, it is encouraged by Nadcap/PRI to contact the appropriate staff engineer(s) to get clarification or review any available handbook or guidance put forth by the task group. As an example, in our scenario, the Coatings Audit Handbook (Oct. 2018), page 12, paragraph 2.3.5 states "Contact the Staff Engineers if you need clarification regarding interpretation of questions or Task Group expectations.". With this

example, it would be difficult to answer any findings obtained with the statement “we didn’t understand the checklist question”. This methodology applies to any commodity. It is the responsibility of suppliers to ensure comprehension of the requirements, both checklists and specifications.

While performing the internal audit, suppliers should recognize questions which state “Do procedures or other documentation...”. Statements such as these will require the supplier to document the procedure number and section/paragraph where the requirement is accounted for. Within our scenario, lets look at an example.

AC7109/3, page 1 & 2, paragraph 3.1 states “Does the supplier have

detailed work instructions describing each step in the diffusion coating process:”. This question goes on to list nine (9) detailed requirements which apply to this question. This would require the supplier to state the form/procedure and paragraph number for each question as it applies.

It is important to recognize that some checklist questions may contain more than one requirement. As an example, AC7109 paragraph 4.2.1 states “Is there a designated technical authority, and a back-up, documented in the Auditee’s system for each process performed (as defined by each checklist listed in the scope of the audit in eAuditNet on the audit details page)?”. When answering this question, the supplier

would need to state the procedure and section for both the designated technical authority and the backup.

Industry Prime Requirements

It would be disappointing for any supplier to have minimal findings regarding checklist requirements only to find that prime/industry requirements have not been accounted for.

Most Quality Engineers are familiar with the term “Bubbling” as it relates to prints. Bubbling a print is a practice in which each requirement is assigned a sequential number. Once this is done on the print, it is then logged onto a form which contains the designated number, its associated

Specification Characteristic Accountability						
Char. #	Requirement	Zone	Where Accounted For	Meets Req't Y/N	If NO, CA steps taken	Meets Req't Y/N
	Are the following sufficient to ensure that all products will meet specified requirements after aging					
1	Quenchant volume	3.6.3.2				
2	velocity	3.6.3.2				
3	distribution	3.6.3.2				
4	agitation (of quenchant and/or product)	3.6.3.2				
	Are the following supported by analysis of data verifying that the specified properties are achieved after aging (not required for additives/concentrations/temperatures previously valid in accordance with AMS-H-6088, MIL-H-6088, AMS2770 or a previous issue of AMS2772).					
5	Quenchant temperature shall conform to 3.6.3.5	3.6.3.2				
6	The additive	3.6.3.2				
7	concentration	3.6.3.2				
8	specific temperature	3.6.3.2				

Figure 2

requirements, the subsequent result and an accept/reject notice.

Typically, this is done on machined parts that may have an intermediate process (such as Coatings) involved in their manufacture. When an intermediate process is performed, the specification itself is typically listed as the requirement and an accept designation is applied.

The specification itself is not bubbled but read by an engineer and the applicable requirements flowed down. A method to account for prime/industry requirements is to bubble the specification itself. Take each requirement out of the specification and assign it a sequential number. Let's call them "Characteristic Requirements". Some paragraphs may have several requirements within a single paragraph; each would be separated and assigned its own sequential number. Let's look at an example within the braze commodity.

AMS2772, paragraph 3.6.3.2 Quench Conditions states "Quenchant volume, velocity, distribution and agitation (of quenchant and/or product) shall be sufficient to ensure that all products will meet specified requirements after aging. Quenchant temperature shall conform to 3.6.3.5. The additive, concentration and specific temperature used for each load shall be supported by analysis of data verifying that the specified properties are achieved after aging (not required for additives/concentrations/temperatures previously valid in accordance with AMS-H-6088, MIL-H-6088, AMS2770 or a previous issue of AMS2772)."

This form contains a lot of information for one to take in. With the characteristic accountability method, this requirement could be split out as per Figure 2.

With this technique suppliers may be more likely to account for each requirement within the Nadcap/PRI scope of approval. This process does take time, although it may be worth the effort in the end.

Article written by
Jason Schulze
eQuaLearn Instructor



Role Specific Training

ROLE SPECIFIC COURSE CONTENT IS THE FUTURE OF TRAINING IN THE AEROSPACE WORLD. COMPANIES OPTING FOR ROLE SPECIFIC TRAINING ARE COMPANIES SERIOUS ABOUT THEIR INVESTMENT IN THEIR PEOPLE.

eQuaLearn is reimagining Quality training.

Aerospace is a very conservative world where changes are slow and late into introduction, mostly on existing product or services. However, if there is one area where Aerospace should not be lingering, it would be its training approach. Previously, the common training approach consisted of breaking knowledge and competence in sections. Training was focused on these sections individually to ensure the subject is delivered in depth, with every conceivable detail possible.

Is that relevant to you? Do you need to know how to build an internal audit plan if you are in procurement? What about RCCA and Risk Analysis if you are in production, how much do you need to know? Furthermore, if you are a Quality Engineer, do you need to know every detail- of the Contract Review process to perform your tasks? (Unless you are the one writing the procedure, of course!)

To address this, eQuaLearn has re-centered its training focus, not about the subject of the training, but on the subject being trained, you! With that in mind, we know there are specific functions and tasks that need to be performed in your organization. There are topics that specific people and/or functions need to be aware of, that may not be relevant to people in other departments. Time is of the essence for every organization.

eQuaLearn has designed training courses to address the personnel directly affected by a certain task within the company while also addressing the "Need to know"



portion of other responsibilities within the organization.

The topics addressed in each course are listed below. Note that each of these Quality trainings will have a different level of “in-depth knowledge” of the subject depending on the training profile selected:

- Aerospace quality overview: Explains quality requirements and the various functions to be performed to help maintain a healthy quality system.
- What is Nadcap? Covers the various requirements of the Nadcap process and why it is known as the world’s most stringent requirements for Special Processes.
- Contract Review: Provides basic to advanced requirements for Contract Review, as well as how to perform this critical function from the individual performing perspective.
- Outsourcing Overview: Expands your knowledge on what is required for outsourcing and how to control the various requirements from qualification to flow down along with other

required functions.

- Risk Analysis – FMEA: An advanced function in APQP used to evaluate the risks at various stages of your organization operations.
- Internal and Nadcap Audit Preparation: Provides you with the necessary information to create, perform, and maintain an Internal Audit plan based on the 9100 and Nadcap requirements.
- RCCA: The process of determining the various causes of a Non-Conformity including the Root Cause as it is required by most quality systems, especially 9100 and Nadcap.
- Problem Solving Tools: Utilized to help perform the various quality functions mainly RCCA and Risk assessment.

If you are in production, Contract Review, Outsourcing, and Risk Analysis may not be so relevant to you, however, RCCA, Internal Audits and Problem-Solving Tools will certainly be of value. This is how the new eQuaLearn training profiles are designed towards. The training is focused on what is necessary in each

section based on what you need to know to perform your daily tasks. Created by world renowned experts in their fields, these 7 hours specialized training courses will provide you with the knowledge for the various quality roles within your organization. Employees who are aware of what is going on in their organization are valuable. They enable pro-activeness and understanding of the various roles and functions required to maintain a healthy quality system. Role specific training can provide this, while maintaining the employees focus and interest.

Invest your time in something that will provide you all the know-how you need to become the best at what you do.

eQuaLearn will pilot the new Nadcap & Quality for Quality Engineer course on 22 October 2019 at the Pittsburgh Nadcap Meeting. Registration is now open. [Contact the team](#) for more information.

Article written by
Guy Levasseur
eQuaLearn Instructor

Training at the Nadcap Meeting Pittsburgh, October 2019



Only a few seats remaining!

Register today for eQuaLearn training courses being offered at the Pittsburgh, PA Nadcap Meeting 21-24 October 2019. Seats are allocated on first-come, first-served basis, don't miss out. Contact eQuaLearn@p-r-i.org

eQuaLearn is on [LinkedIn](#) - please follow us to keep up-to-date with our news.



Looking Ahead to February 2020 Training Schedule in Beijing, China

Course Title	Course Summary (all taught in English and Chinese)	When	Cost
Nadcap Audit Criteria Review – Non Destructive Testing	<p>This course is designed to provide a complete overview of Nadcap requirements related to the NDT audit and is conducted by experienced instructors. All instructors are experts in Nadcap NDT requirements.</p> <ul style="list-style-type: none"> • Present the structure and format of a Nadcap NDT audit • Assure an understanding of the content and intent of all sections of each AC7114 Audit Criteria series used during a NDT audit 	February 25-26-27 (9:00am- 6:00pm)	\$750 USD
Effective Aerospace Outsourcing	<p>This course will be useful to companies seeking ISO 9001, AC7004, 9100 and Nadcap accreditation. For accredited companies the course will facilitate continual improvement on these subjects. The course content will be applicable to staff involved with quality assurance and control, vendor compliance, purchasing and production planning.</p>	February 25 (8:00am-12:00pm)	\$50 USD
Internal Auditing Systems Overview	<p>Assists in the process of building an internal audit system and how to structure the key elements of the system for success while also explaining the vital relationship between Quality and Management.</p>	February 25 (1:00pm-6:00pm)	\$50 USD
Contract Review	<p>Shows Contract Review as a multi-disciplinary process which should ensure that all potential problems are identified and addressed before any commitment to supply is made. This course describes what must be done. The requirements are explained and illustrated by discussions around common problems and weaknesses. Participants will receive a certificate of completion.</p>	February 26 (9:00am-6:00pm)	\$50 USD
Penetrant Testing and Magnetic Testing Self-Audit Risk Assessment	<p>Designed for reviewing the potential failure modes of some of the most common findings associated with penetrant and magnetic particle audit criteria, and the associated NDT quality system questions in AC7114. This is a dynamic course focusing on predicting the failure modes of common findings starting from AC7114, through AC7114/1 and AC7114/2. The course content will briefly highlight some of the most common findings documented within the past year to eighteen months.</p>	February 27 (10:30am- 6:00pm)	\$50 USD

New Branding!

eQuaLearn becomes PRI Training

WE ARE EXCITED TO ANNOUNCE THAT, FROM OCTOBER 31, WE WILL BE PROUDLY DISPLAYING A NEW IDENTITY.

As part of PRI's broader brand strategy, that reaches across the whole organization, moving forward, eQuaLearn will be known as PRI Training. The decision was taken to bring our training courses closer to the PRI identity and support clarity in our name and branding. This means many changes for us such as:

- New email address PRITraining@p-r-i.org
- New website address www.PRI-Training.com
- New LinkedIn page

With nearly 60 courses available in multiple languages, it will take us a little time to migrate all our material over to the new brand. As a loyal customer, here's a preview of the new identity – we hope you like it!



The key takeaway is that, while our name and visual identity is changing, you can continue to expect from us the same high quality courses, excellent customer service and attention to detail that you have always enjoyed.

If you have any questions, please don't hesitate to [contact us](#).

Onsite Training

ONSITE TRAINING IS A PERFECT OPPORTUNITY TO RECEIVE TRAINING THAT FITS YOUR COMPANY'S SPECIFIC NEEDS AND BUDGET.

Our instructors are subject matter experts who assure your learning experience is a success. All eQuaLearn special process and quality courses are available for onsite training.

Onsite training offers great perks:

- Reduce time out of the office as the training comes to you
- Choose the date that works best for your company
- Ask your questions to an expert instructor in a confidential environment

[Visit our website](#) for a complete list of courses. [Contact a team member](#) to answer any questions or to book your onsite training today.

What do you want to read about?

The intent of the eQuaLearn newsletter is to provide timely, valuable and interesting content to support the Nadcap community to continually improve their operations. If there is a specific topic you would like to read about, please tell us via email to eQuaLearn@p-r-i.org.

2020 Schedule

The 2020 public course schedule will be released in conjunction with the new named PRI Training website on 31 October 2019.

[Request a reminder](#) when registration is open so you can secure your 2020 training using your 2019 budget!

eQuaLearn Membership

[eQuaLearn Membership](#) is a prestigious association with an international organization dedicated to developing quality professionals and improving special process technical skills. Membership is a powerful and efficient way to support the need for continuous staff development and improved productivity. Membership is available for anyone interested in advancing their learning in the quality or special process field. If you are a quality manager, engineer, or employee in any department related to quality or special processes, there is an eQuaLearn membership level to help you and your company meet your educational goals. eQuaLearn Membership provides a way for both companies and individuals to achieve their professional development goals.

Benefits of Membership

- Allow companies to invest in staff development
- Provide customized benefits and options
- Offer increased levels of service
- Generous discounts and preferential rates

[Learn more](#)

Meet the Instructor

Robert Werber

MY NAME IS ROBERT WERBER, BUT I GO BY BOB. I AM AN ENGINEER BY TRAINING AND EXPERIENCE AND HAVE BEEN A REGISTERED PROFESSIONAL ENGINEER IN VARIOUS STATES SINCE THE 1980'S. I STARTED TEACHING CLASSES IN METALLURGY, HEAT TRANSFER AND THERMODYNAMICS ALMOST 20 YEARS AGO.



After graduate school, I worked for companies which made gas turbine engines for military applications. I immediately became involved with AMS, MIL, and internal company specifications dealing with materials and processing. Fortunately, I was able to work with many experienced metallurgists. I learned more about the application of superalloys, high temperature stainless, titanium alloys, etc. than was ever mentioned in college classes.

I later started working for a large investment casting corporation where I was involved in process control of vacuum and air cast components, as well as their heat treatment and finishing. I became involved with heat treat audits as an auditee. I know both what it is like to be audited, and what it is like to conduct Nadcap heat treat audits.

When I became a Nadcap Heat Treat Auditor, PRI was requiring new Heat Treat Auditors to take the Introduction to Pyrometry class. That was my first exposure to eQualLearn classes. Given my interest in teaching, I inquired about opportunities with eQualLearn.

In addition to the Introduction to Pyrometry course, I currently teach classes in Root Cause Corrective Action, Nadcap Audit Preparation- Heat Treat, Heat Treat Owner and Heat Treat Operator. These are subjects which I have been involved with throughout my professional career and I often incorporate examples gleaned from experience. One of the reasons I enjoy teaching is that students can come up with some interesting questions which keep me on my toes.

One fun fact about me is that I met my wife, a teacher, in a small town in Nevada while I was prospecting for minerals. Though I never did strike gold I discovered riches come in many forms.

Our Team

If you are registered to attend the Nadcap meeting in Pittsburgh in October 2019, please visit the eQualLearn Helpdesk to discuss public, hosting or onsite training opportunities with the team.



MICHELE STEFANCHIK
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SPECIALIST

For any additional questions regarding training, please contact an eQualLearn team member at eQualLearn@p-r-i.org or visit our website www.eQualLearn.com.



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