



PD3001

REV A

Issued Nov 14, 2003
Revised 31-MAY-05

Superseding PD3001

PROGRAM DOCUMENT

161 Thorn Hill Road
Warrendale, PA 15086-7527

NUCAP AUDITOR SELECTION, APPROVAL AND TRAINING

1. PURPOSE

This document is intended to delineate the selection, personnel training and approval program for individuals conducting technical audits for the NUCAP Organization under the NUCAP Program.

2. SCOPE

This document describes the minimum requirements for qualification, training, examination, and approval of NUCAP Auditors. This document also addresses pertinent responsibilities for procedures, periodic training, performance review, and record keeping requirements.

3. DEFINITIONS

AUDITOR: An "Auditor" is an individual qualified and approved as such in accordance with the NUCAP Organization's Audit Procedure. The Auditor is the individual who carries out an assigned audit in compliance with the applicable standard and prepares and submits a written audit report. Auditors may lead audits on which non-qualified auditors participate for training purposes.

AUDIT PROCEDURE: An "Audit Procedure" is a documented procedure (or set of procedures) prepared and controlled by the NUCAP organization which addresses the organizations special process audit requirements. The Audit Procedure shall address all applicable requirements of this document (either directly or by reference) and shall be in compliance with the applicable requirements stated herein.

PRI operating procedures provide that "This report is published by PRI to advance the state of technical, engineering, and quality sciences. The use of this report is entirely voluntary, and its applicability and suitability for any particular use, including any patent infringement arising therefrom, is the sole responsibility of the user."

PRI invites your written comments and suggestions.

PRI PD3001

NUCAP: Nadcap Users Compliance and Audit Program

NUCAP ORGANIZATION: An approved Nadcap User Member or organization applying for NUCAP Certification or Re-certification.

NOTE: Non-qualified individuals shall not independently conduct audits or audit results.

4. APPROVAL REQUIREMENTS FOR AUDITORS

To be approved as a NUCAP Auditor, candidates must satisfactorily meet the requirements defined by the NUCAP Organization's internal procedure. These requirements at a minimum must meet the following requirements:

Initial qualification combines education, experience, training, and other evidence of professional accomplishment. Each auditor candidate shall document background information per the standard form, "Questionnaire for Potential NUCAP Auditors", which identifies education, training, work experience, and audit experience. Copies of candidate's certificates of training and competency shall be included, as appropriate.

Specific numerical values (credits) are assigned to each of these attributes and shall be documented on each commodity specific auditor candidate questionnaire. The following criterion apply unless specifically addressed in the applicable task group appendices.

To be considered as a NUCAP Auditor Candidate, for any commodity, an individual must accrue at least **8** of the possible **15** credits in the categories 4.1.1 through 4.1.3 and meet the specific point screening criteria applicable to each commodity, as identified in the appendices to this program document listed in Section 4.1.4. As an alternative the individual may qualify under the industry peer recognition requirements of "Qualifying Existing Special Process Auditors" provisions in section 4.1.5.

4.1 Education

(Minimum of high school graduation or graduate equivalency examination required)

- | | |
|---|----------------|
| A) Associate degree from an accredited institution, if the degree is in engineering, physical science, materials science, or quality assurance | • 1 credit, or |
| B) Bachelor's degree from an accredited institution, if the degree is in engineering, physical science, materials science, or quality assurance | • 3 credits |
| C) For a Master's degree in engineering, physical sciences, materials science, business management, or quality assurance from an accredited institution | • add 1 credit |

PRI PD3001

4.2 Experience

- A) Technical aerospace or defense experience
 - 1 credit each
 - 3 full years
 - 3 credits max
- B) Quality Assurance, Quality auditing experience
 - 1 credit each
 - 3 full years
 - 3 credits max
- C) Process control experience
 - 1 credit each
 - 3 full years
 - 3 credits max

4.3 Professional Accomplishment

- A) Certification of competency in engineering, science, or quality assurance specialties issued and approved by a state agency or national professional or technical society, e.g., ASQC Certified Quality Auditor or Registered Professional Engineer
 - 1 credit
- B) Documented participation on pertinent technical committees, e.g., SAE, ASM, ASME, ASNT, MTI
 - 1 credit

4.4 Commodity-Specific Requirements

Specific screening qualification requirements are established by the applicable Nadcap Task Group and are shown in the applicable appendix of this program document.

From Appendix

- Additional Requirements for Nondestructive Testing
 - Appendix I
- Additional Requirements for Materials Testing
 - Appendix II
- Additional Requirements for Welding
 - Appendix III
- Additional Requirements for Chemical Processing
 - Appendix IV
- Additional Requirements for Heat Treating
 - Appendix V
- Additional Requirements for Coatings
 - Appendix VI
- Additional Requirements for Nonconventional Machining and Surface Enhancement
 - Appendix VII
- Additional Requirements for Composites
 - Appendix VIII

PRI PD3001

4.5 Qualifying Existing Special Process Auditors:

Auditors who are:

- Qualified for special process auditing under the requirements established by NUCAP Organization prior to its application for NUCAP accreditation and:
- Are performing internal process audits within their organization for a minimum of one year at the time of the initial NUCAP review for applicable process.

May be qualified for each special process category in one of the following ways:

1) Recognition of Industry Peers as a subject matter expert by:

- a) Active participation in the applicable Nadcap special process task group
- b) Recognition as a subject matter expert by the applicant's NUCAP Review Team.

2) Existing Special Process Auditors not participating in a Nadcap Task Group

- a) Passing a subject matter exam (Content developed by the NUCAP Organization)
- b) Nadcap developed training on the Nadcap Checklist given by NUCAP Organization or by PRI

NOTE: For NDT, qualification to a minimum of Level II, Auditor, or Level III in accordance with NAS-410 or equivalent is required.

4.6 Training

4.6.1 All NUCAP auditors shall be trained on the applicable Nadcap checklists.

4.6.2 Training shall be given to each Auditor on an annual basis. The training shall periodically include an exchange of lessons learned, checklist review/updates and discussion of audit results and trends.

5.0 DOCUMENTATION

Records of auditor qualifications, examinations, training, approvals and activity and performance shall be maintained, in accordance with internal record retention requirements.

Audit reports submitted by each auditor shall be kept on file and be available for review by customers, regulatory agencies, and approved third parties.

PRI PD3001

5.1 The NUCAP Organization shall maintain records

Records shall be maintained in a manner to prevent damage, loss, or deterioration, and shall be identifiable to facilitate retrieval.

Record retention for audit reports shall be a minimum of 5 years. Records of auditor training, examination and other qualification requirements shall be maintained while the auditor's qualification is in effect, plus three years thereafter.

**APPENDIX I: ADDITIONAL REQUIREMENTS FOR AUDITORS OF
NONDESTRUCTIVE TESTING LABORATORIES**

This standard establishes the minimum requirements for the qualification and certification of Nondestructive Testing Auditors.

A.) QUALIFICATION REQUIREMENTS

1) AUDITOR - Must have completed Auditor Candidate requirements and must have satisfied requirements of Section 4.1. In addition, the candidate shall meet the qualification and training requirements as defined below, and as evidenced by a point score of 6 credits minimum, satisfying the education and experience categories as indicated.

a) Education (2 credits maximum)

- Special NDT Training 1 credit for each full year

b) Experience (2 credits minimum, 6 credits maximum)

- Hands-on work experience as an NDT technician or engineer at a minimum Level I certification 1 credit for each full 3 years (2 credits max)
- NDT auditing experience 1 credit for each full 3 years (4 credits max)
- Supervisor of an NDT lab 1 credit for each full 2 years (2 credits max)

PRI PD3001

c) Professional Accomplishment (2 credits minimum, 6 credits maximum)

- | | |
|---|---|
| • Certification as Level II in an NDT method | 1 credit per method for each 3 full years (2 credits max) |
| • Certification by examination as a Level III in an NDT method (SNT-TC-1A, NAS 410/EN 4179, or equivalent system) | 1 credit per method for each 3 full years (2 credits max) |
| • Certification by other means as a Level III in an NDT method | 1 credit per method for each 6 years (2 credits max) |

B) LEVELS OF CERTIFICATION:

- 1) AUDITOR - An auditor must successfully complete a general examination, a specific examination and a practical examination for each NDT method.

a) Exams:

The general exam shall be a closed book examination and shall cover the method specifications, codes and equipment the candidate may review/audit in the performance of his/her duties. A minimum of 40 questions shall be used for each method.

The specific exam shall be a closed book examination consisting of questions, which cover the NUCAP Organization's operations and basic auditing procedures. A minimum of 30 questions shall be used.

The practical examination shall consist of the candidate's participation in an actual audit in each applicable method with a certified Auditor confirming that the audit is being done properly. The certified Auditor shall countersign the Audit Checklist completed by the candidate and shall submit a written evaluation of the candidate's performance of the audit to the audit examiner.

b) Grading:

The candidate for certification must achieve a minimum grade of 70% on the general and specific examination and the practical evaluation. The candidate must have an average score of no less than 80% in order to be eligible for certification. All examination scores shall be of equal weight in determining the average score.

C) CERTIFICATION:

The NUCAP Organization shall certify Auditors based on review of qualifications, exams and requirements as defined in NUCAP participants internal work instructions.

PRI PD3001

B) Experience (2 credits minimum, 6 credits maximum)

- Work experience as technician or engineer in a Testing laboratory 1 credit for each full 3 years (2 credits max)

- Laboratory auditing experience 1 credit for each full 3 years (2 credits max)

- Supervisor of a Materials Testing Laboratory 1 credit for each full 2 years (2 credits max)

C) Professional Accomplishments (2 credits maximum)

- Teaching experience at university level in Mechanical/Metallurgical Engineering/Materials Science/Chemistry/Chemical Engineering 1 credit for each full 3 years (1 credit max)

- Recognized expertise in specific aspects of materials testing, demonstrated by publication of a minimum of three papers in area of interest 1 credit

APPENDIX III: ADDITIONAL REQUIREMENTS FOR AUDITORS OF WELDING FACILITIES

The following commodity specific qualification and training requirements have been established by the Nadcap Welding Task Group. Reference base program document Paragraph 4.1.4.

MINIMUM EXPERIENCE

Auditor Candidate shall have experience in at least two of the following major process areas:

- Gas Shielded Arc Processes
- Resistance
- Electron Beam

TOTAL _____

PRI PD3001

At a minimum, the candidate must be familiar with at least three of the following additional processes:

- Laser
- Friction/Inertia
- Flash/Pressure Butt
- Diffusion Welding
- Stud Welding/Percussion Stud
- Torch Brazing
- Other (Count 1 Credit/Process)

NOTE: Experience must be in a field directly related to welding or welding inspection (i.e., inspection, procedure or technique development, or specification analysis).

TOTAL _____

ADDITIONAL EXPERIENCE

A. Experience (Minimum Credits in this Section - 2)

- One credit for each 3 years above minimum aerospace experience (max credits - 3)
 - 5years experience with 3 in aerospace for BS
 - 7 years experience with 4 in aerospace for AS
 - 10 years experience with 5 in aerospace for HS
- One credit for each additional welding process, above the basic 5 processes the candidate is familiar with (2 major and 3 additional) (max credits - 3)
- One credit for each welding certification held per process (max credits - 2)
- One credit for each 3 years of auditing experience (max credits - 3)

SUBTOTAL A _____

PRI PD3001

B. Education (Minimum Credits in this Section - 2)

- Degree in welding engineering or related field with emphasis in welding (1 credit)
- Successful completion of an Auditor Training Program (1 credit)
- Welding education/training classes (1 credit)
- SPC Training (1 credit)
- Training programs relative to process improvement, total quality, TQM, etc. (1 credit)

SUBTOTAL B _____

C. Professional (Maximum Credits in this Section - 5)

- Professional Engineer (2 credits)
- Certified Welding Inspector (1 credit)
- Certified Quality Engineer/Auditor (1 credit)
- Certified ISO 9000 Auditor (2 credits)
- Certified Welding Educator (1 credit)
- Committee Membership in a professional society related materials joining (1 credit)

SUBTOTAL C _____

TOTAL: A, B & C _____

PRI PD3001

APPENDIX IV: ADDITIONAL REQUIREMENTS FOR AUDITORS OF CHEMICAL PROCESSING

The following commodity specific qualification and training requirements have been established by the Nadcap Chemical Processing Task Group. Reference base program document paragraph 4.1.4.

Prequalification: In addition to meeting the general pre-screen criteria of the base procedure, all NUCAP auditors of chemical processing shall meet the qualification and training requirements as defined below. Meeting the qualification and training requirements shall be evidenced by a point score of 6 credits minimum of a possible 14 credits.

A) Education (3 credits maximum)

- Bachelors of Science Degree in Chemistry or Engineering 2 credits
- Graduate Degree in Chemistry or Engineering 1 credit

B) Experience (2 credits minimum, 6 credits maximum)

- Work Experience as a technician, engineer, operator in a metal finishing shop in a minimum of two processes (1 credit for each 2 full years, 2 credits minimum)
- Anodizing 1 credit
- Conversion Coating 1 credit
- Electroplating 1 credit
- Chemical Milling/Etching 1 credit
- Painting/Dry Film 1 credit
- Passivation 1 credit
- Process/Product Auditing Experience (1 credit for each 2 full years, 2 credits maximum) 1 credit

C) Professional Accomplishment

- ASQ CQA Certification 1 credit
- Lead Assessor ISO 9000 1 credit
- Additional Certifications 1 credit

PRI PD3001

APPENDIX V: ADDITIONAL REQUIREMENTS FOR AUDITORS OF HEAT TREATING

The following commodity specific qualification and training requirements have been established by the Nadcap Heat Treat Task Group. Reference base program document paragraph 4.1.4.

All NUCAP heat treat auditor candidates must have at least one of the following:

- Bachelor's Degree in technical field and five (5) years heat treat or furnace braze experience, 3 of which are in aerospace/defense industry
- Associate Degree in a technical field and seven (7) years heat treat or furnace braze experience, four (4) of which are in aerospace/defense industry
- High School Diploma and ten (10) years heat treat or furnace braze experience, five (5) of which are in aerospace/defense industry

Heat Treat or Furnace Braze Experience = Operator, Supervisor, Technician, or Engineer with direct exposure to heat treat or furnace braze equipment qualification, procedure qualification, or technical problem resolution.

A) Education (1 credit minimum, 4 credits maximum)

- Metallurgical Engineering or Materials Science Degree
Associates Degree 1 credit
Bachelors of Science Degree or Higher 2 credits
- AS9000, ISO 9000, AS9100 or Prime Special Process Auditor Training 1 credit
- Heat Treat/Braze Continuing Education Training 1 credit

B) Experience (2 credits minimum, 9 credits maximum)

- Each three (3) years over minimum (maximum 6 credits) 1 credit
- Each three (3) years of Heat Treat/Furnace Braze Auditee/Audit Experience 1 credit

C) Professional Accomplishment (1 credit minimum, 2 credits maximum)

- Professional Engineer, Certified, Qualified Engineer, Certified Lead Auditor 1 credit
- Leadership in Professional Society (ASM, HTS, AWS) 1 credit

PRI PD3001

- D) General Knowledge (3 credits minimum)
- On a scale of 1 to 5, self-rating of 3 or higher on familiarity with and understanding of AMS 2750 or prime contractor pyrometry specifications 1 credit
 - On a scale of 1 to 5, self-rating of 3 or higher on familiarity with and understanding of aerospace heat treat or furnace braze specifications 1 credit
 - On a scale of 1 to 5, self-rating of 3 or higher on familiarity with heat treat equipment 1 credit
 - On a scale of 1 to 5, self-rating of 3 or higher on familiarity with and understanding of testing of heat treated material or product 1 credit
- E) Heat Treat/Furnace Braze Written Test
- Auditor candidate must complete this test administered by the audit examiner. Candidate must score 50 out of 100 points to be eligible to be an auditor.

APPENDIX VI: ADDITIONAL REQUIREMENTS FOR AUDITORS OF COATINGS

The following commodity-specific qualification and training requirements have been established by the Nadcap Coatings Task Group. Reference base program document paragraph 4.1.4.

Prequalification: In addition to meeting the general pre-screen criteria of the base program document, all NUCAP auditors of coatings shall meet the qualification and training requirements as defined below. Meeting the qualification and training requirements shall be evidenced by a point score of 6 credits minimum of a possible 12 credits.

- A) Education (3 credits maximum)
- Bachelor of Science Degree 1 credit
 - The BS Degree is in Engineering or Materials Science add 1 credit
 - Graduate Degree in Engineering or Materials Science add 1 credit

PRI PD3001

B) Experience (2 credits minimum, 6 credits maximum)

- Work Experience as a technician, engineer, operator in a coating operation in a minimum of two processes (1 credit for each 2 full years, 2 credits minimum)
 - Thermal Spray (Plasma, Flame, HVOF, D-Gun, Arc Spray, LPPS, etc.)
 - Vapor Deposition
 - Cementation
 - Stripping
 - Coating Evaluation
 - Plating of Coated Parts
 - Heat Treatment of Coated Parts
- Process/Product Auditing Experience
(1 credit for each 2 full years, 2 credits maximum)

C) Professional Accomplishment (3 credits maximum)

- ASQ CQA Certification 1 credit
- Lead Assessor ISO 9000 1 credit
- Additional Professional Certifications 1 credit

**APPENDIX VII: ADDITIONAL REQUIREMENTS FOR AUDITORS OF
NONCONVENTIONAL MACHINING AND SURFACE ENHANCEMENT**

The following commodity specific qualification and training requirements have been established by the Nadcap Nonconventional Machining and Surface Enhancement (NMSE) Task Group. Reference base program document Paragraph 4.1.4.

PRI PD3001

NONCONVENTIONAL MACHINING MINIMUM PROCESS EXPERIENCE

NUCAP Auditor Candidate shall have experience in at least two of the following major process areas:

- Electrochemical Machining (ECM) _____
 - Electrochemical Grinding (ECG) _____
 - Electrical Discharge Machining (EDM) _____
 - Laser Beam Machining (LBM) _____
- TOTAL _____

NOTE: Experience must be in a field directly related to nonconventional machining or nonconventional machining inspection (i.e., inspection, procedure or technique development, or specification analysis)

NONCONVENTIONAL MACHINING ADDITIONAL EXPERIENCE

Auditor Candidate shall have field auditing experience related to the processes. One credit for each 3 years of auditing experience. (Minimum **1** credit required, Maximum **3** credits) _____

SHOT PEENING MINIMUM PROCESS EXPERIENCE

Auditor Candidate shall have experience in at least two of the following major process areas:

- Automated _____
 - Computer Controlled _____
 - Flapper _____
 - Manual _____
 - Peen Forming _____
- TOTAL _____

NOTE: Experience must be in a field directly related to shot peening or shot peening inspection (i.e., inspection, procedure or technique development, or specification analysis)

PRI PD3001

SHOT PEENING ADDITIONAL EXPERIENCE

Auditor Candidate shall have auditing experience related to the processes. One credit for each 3 years of auditing experience. (Minimum 1 credit required, Maximum 3 credits) _____

APPENDIX VIII: ADDITIONAL REQUIREMENTS FOR AUDITORS OF COMPOSITES

The following commodity specific qualification and training requirements have been established by the Nadcap Composites Task Group. Reference base program document Paragraph 4.1.4.

To be considered for an Auditor the applicant must satisfy the requirements of Section 4.1, 4.2 and 4.3 of the base program document. To ascertain the level of composites/auditing experience, the auditor must meet the following requirements.

COMPOSITES TECHNICAL EXPERIENCE - GENERAL

Auditor shall have a minimum of three years direct experience (Aerospace Industry preferred) in the following aspects of composites:

- Basic physical, mechanical, and chemical properties of composite materials _____
 - Basic raw material testing methods _____
 - Storage, handling and environmental control of composites _____
 - Facilities experience related to composites (i.e. autoclaves, laser projectors, ply cutters) _____
 - Processing of various composite materials (i.e. BMI, Polyimide, adhesives and honeycomb core) _____
 - Bagging procedures and tooling requirements (i.e. tool repair, and maintenance for composite and metallic tooling) _____
 - Nondestructive testing of composites (optional) _____
 - Composite properties testing (optional) _____
 - Chemical processing (i.e. anodizing, priming) of metallic structures used in composites fabrications (optional) _____
- TOTAL (Minimum 6 credits, Maximum 9 credits) _____

PRI PD3001

Auditor shall have experience (Aerospace Industry preferred) in at least two of the following major composite fabrication processes:

- Prepreg/Adhesive Bonding _____
- Metal Bonding _____
- Core Processing _____

TOTAL (Minimum 2 credits, Maximum 3 credits) _____

COMPOSITES TECHNICAL EXPERIENCE – PREPREG/ADHESIVE BONDING

Auditor shall have a minimum of three years experience related to prepreg/adhesive bonding. One credit for each three years, three credits maximum.

TOTAL (Minimum 1 credit, Maximum 3 credits) _____

COMPOSITES TECHNICAL EXPERIENCE – METAL BONDING

Auditor shall have a minimum of three years experience related to metal bonding. One credit for each three years, three credits maximum.

TOTAL (Minimum 1 credit, Maximum 3 credits) _____

COMPOSITES TECHNICAL EXPERIENCE – CORE PROCESSING

Auditor shall have a minimum of three years experience related to core processing. One credit for each three years, three credits maximum.

TOTAL (Minimum 1 credit, Maximum 3 credits) _____

AUDITING AND QUALITY ASSURANCE EXPERIENCE

Auditor shall have second or third party auditing experience (Aerospace Industry preferred) related to the processes. One credit for each 3 years of auditing experience. (Minimum 1 credit required, Maximum 3 credits) _____

Registrar Accreditation Board (RAB) approved and/or International Auditor and Training Certification Accreditation (IATCA), or completed a certified Lead Auditor Training course. (preferred). One credit. _____

TOTAL (Minimum 1 credit, Maximum 4 credits) _____