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Chris Carnahan

Director, Standardization

Aerospace Industries Association
Brief History of NAS410

• NAS410 Originated from MIL-STD-410.

• Department of Defense specifications and standards were replaced by industry specifications and standards due to DoD acquisition reform in 1994.

• NAS410 original release was May 1996 – MIL-STD-410E was officially cancelled by DoD in December 1997 and adopting NAS410 as a replacement.

• NAS410 Revision 2 (Feb2003) was first revision to be harmonized with Europe’s EN4179.
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John Ellegood

Lockheed Martin Space Systems

AIA NDTSC Chairman
Major Areas of Revision

- Defined Requirements for Non-Film Radiography
- Provides Transition Hours for Film and Non-Film RT
- Added Annual Maintenance For Certification
- Redefines National Aerospace NDT Boards
- Reduced Experience Hours for RT, UT, & ET
- Provides Near Vision Examination Options
- Revised Annex A Requirements for Recertification
- Level 3 Certification – Achieving Level 2 is a prerequisite
Revision 4 Effectivity

• Six (6) Months permitted by left hand margin note.

• Section 1.2.1 - Personnel certified to previous revisions of NAS410 or EN 4179 need not recertify to the requirements of this standard until their current certification expires.

• For personnel previously certified, see “Equivalent” training and experience sections 6.1.3 and 6.3.2
Revision of Definitions

• Added “Formal Education” [3.12]

• Revision of “National Aerospace NDT Board [3.19]

• Added “Non-Film Radiography” [3.20]

• Minor Editorial Changes to Other Definitions
Written Practice

• Added requirement for a process of annual certification maintenance. [4.1]

• Deleted sentence that permitted NAS410 to be used in whole or in part to meet requirement of Written Practice. [4.1]

• Add requirement to define additional training, experience, and examination when an employer adds new techniques for currently certified personnel. [4.1.2]

• For training outlines, deleted requirement to define amount of time in each subject area. [4.1.3]
National Aerospace NDT Board [4.4.2]

• When an NANDTB is used, the employer is responsible for certification and must designate a Responsible Level 3.

• The employer’s Responsible Level 3 may use an NANDTB for the following:
  • Develop training course outlines and training material.
  • Create examination questions and administer examinations.
  • Approve outside and/or internal organizations providing training and/or examination services.
  • Define requirements for qualification of NDT personnel in emerging NDT methods.
  • Retain written and practical examinations.
  • Designate Examiners and/or instructors at outside or internal organizations providing training and examination services.
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Louis Truckley

The Boeing Company,

AIA NDTSC Executive Secretary
Level I-Limited [4.3]

• Each use of Level 1-Limited is a separate certification and shall be approved by the cognizant engineering organization.

• An individual shall not possess more than three Level 1-Limited certifications at any given time.
Table I - Formal Training Hours

<table>
<thead>
<tr>
<th>Method</th>
<th>Level 1</th>
<th>Level 2 with previous Level 1 certification</th>
<th>Level 2 without previous Level 1 certification</th>
</tr>
</thead>
<tbody>
<tr>
<td>PT</td>
<td>16</td>
<td>16</td>
<td>32</td>
</tr>
<tr>
<td>MT</td>
<td>16</td>
<td>16</td>
<td>32</td>
</tr>
<tr>
<td>IRT</td>
<td>20</td>
<td>40</td>
<td>60</td>
</tr>
<tr>
<td>ST</td>
<td>20</td>
<td>40</td>
<td>60</td>
</tr>
<tr>
<td>ET</td>
<td>40</td>
<td>40</td>
<td>80</td>
</tr>
<tr>
<td>UT</td>
<td>40</td>
<td>40</td>
<td>80</td>
</tr>
<tr>
<td>RT Film or NonFilm</td>
<td>40</td>
<td>40</td>
<td>80</td>
</tr>
<tr>
<td>RT Film &amp; NonFilm</td>
<td>60</td>
<td>60</td>
<td>120</td>
</tr>
</tbody>
</table>

New
Table IA – Transition Hours for RT

- 40 Hours Additional Training for RT Level 3’s [6.1]

### TABLE IA – RT FORMAL TRAINING HOURS FOR TRANSITION TO FILM AND NONFILM

<table>
<thead>
<tr>
<th></th>
<th>Current Level 1</th>
<th>Current Level 2</th>
<th>Current Level 1 to Level 2 Film &amp; NonFilm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Additional Hours</td>
<td>20</td>
<td>40</td>
<td>80</td>
</tr>
</tbody>
</table>
### Table II – Experience Hours

<table>
<thead>
<tr>
<th>Method</th>
<th>Level 1 (Trainee experience)</th>
<th>Level 2 with previous Level 1 certification</th>
<th>Level 2 without previous Level 1 certification</th>
</tr>
</thead>
<tbody>
<tr>
<td>PT</td>
<td>130</td>
<td>270</td>
<td>400</td>
</tr>
<tr>
<td>MT</td>
<td>130</td>
<td>400</td>
<td>530</td>
</tr>
<tr>
<td>IRT</td>
<td>200</td>
<td>600</td>
<td>800</td>
</tr>
<tr>
<td>ST</td>
<td>200</td>
<td>600</td>
<td>800</td>
</tr>
<tr>
<td>ET</td>
<td>200</td>
<td>600</td>
<td>800</td>
</tr>
<tr>
<td>UT</td>
<td>200</td>
<td>600</td>
<td>800</td>
</tr>
<tr>
<td>RT Film or NonFilm</td>
<td>200</td>
<td>600</td>
<td>800</td>
</tr>
<tr>
<td>RT Film &amp; NonFilm</td>
<td>220</td>
<td>780</td>
<td>1000</td>
</tr>
</tbody>
</table>

- 50% Reduction Note **Deleted** for Simultaneous Multiple Methods
Table IIA – Transition Hours for RT

- 240 Hrs for RT Level 3’s with guidance or supervision from examiner, instructor, or outside agency. [6.3]

<table>
<thead>
<tr>
<th>Current Level 1</th>
<th>Current Level 2</th>
<th>Current Level 1 to Level 2 Film &amp; NonFilm</th>
</tr>
</thead>
<tbody>
<tr>
<td>20</td>
<td>200</td>
<td>800</td>
</tr>
</tbody>
</table>
Level 3 Certification

• “Individuals cannot certify to Level 3 without prior certification to Level 2 in the method.” [6.1]

• Permitting determination of Level 2 “equivalency” has been removed. [6.1 & Table III]
### Vision Examinations

**TABLE V – VISION REQUIREMENTS**

<table>
<thead>
<tr>
<th>Examination Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Tumbling E in accordance with ISO 18490</td>
</tr>
<tr>
<td>• 20/25 (Snellen) at 16&quot; (40.64 cm) +/- 1&quot; (2.54 cm)*</td>
</tr>
<tr>
<td>• Jaeger No. 1 at not less than 12&quot; (30.48 cm) *</td>
</tr>
</tbody>
</table>

* In at least one eye, natural or corrected

- “Equivalency” determination by Responsible Level 3 has been removed.
Written Examinations

• “An oral or verbal translation of written examinations is not permitted.” [7.1]

• Specific Examinations – Reference material shall be provided. [7.1.3]

• Specific Examinations – “When a wider scope is used by the NANDTB, the employer is responsible for administering a supplemental examination representative of the employer’s processes.” [7.1.3]
Practical Examinations

• “The candidate shall not be familiar with the test sample and the location of the defects located therein.” [7.1.4]

• “When a wider scope is used by the NANDTB, the employer is responsible for administering a supplemental examination representative of the employer’s products.” [7.1.4]

• For Level 2’s, the option to include specimens without discontinuities is allowed in addition to two minimum specimens with discontinuities. [7.1.4.3]
• “For trainees gaining experience, documentation shall be available for review to indicate individual, date, task, hours, and certified personnel providing direct observation.” [6.3]

• “For documentation of previous experience, records other than original records may be accepted if adequacy and equivalency have been determined to be acceptable by the Responsible Level 3 or Examiner.” [6.3.1]
• “If Annex A is used, documentation of credit points used for Level 3 recertification. Last written and practical examinations need not be maintained.” [8.2.d]

• “Suspended or revoked certification(s) shall be documented for reason and date. If applicable, date and action to reinstate certification(s) shall also be documented.” [8.2.e]
Loss of Certification

• **EXPIRATION:** “Certification, annual maintenance, and vision examinations are considered to expire at the end of the corresponding month in which the event began.” [8.3.1]

• **SUSPENSION:** [8.3.2]
  - Vision examination is expired.
  - Individual does not perform in the method certified for at least 12 consecutive months.
  - Individual fails recertification examination. (New)
  - Individual's performance is found to be deficient in any manner.
  - Annual maintenance is expired. (New)
Loss of Certification

REVOCATION: Certification shall be revoked when the individual does not perform in the certified method for the employer for at least 24 consecutive months, when employment has been terminated, or when the individual’s conduct is found to be unethical or incompetent. When an individual is re-hired by the same employer within 24 months, certification may be considered as suspended. [8.3.3]
Reinstatement of Certification

• New Sentence:

“Current NANDTB certificates may be utilized for new employment provided that the new employer administers specific and practical examinations that are representative of their processes and product per 7.1.3 and 7.1.4.” [8.4]
• **New Section:**

8.6 ANNUAL MAINTENANCE: The employer shall develop and implement a documented annual process to verify technical proficiency for each method during the certification cycle for all levels of personnel processing or inspecting hardware. [8.6]
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Jon Voeller

USAF Nondestructive Inspection Office,
Senior Materials Engineer
Annex A

• “Application for recertification of the Responsible Level 3 shall be made directly to the applicable regulatory agency, NANDTB, or employer for review by a designated Level 3.” [A.2.1]

• New Section:

  “Continuity in the method shall be demonstrated. The candidate shall provide a list of 8 verifiable Level 3 tasks in each NDT method for which recertification is sought covering the 5 year period.” [A.2.3]
Annex A

- **New Section:**

  “The approval of Annex A activity documentation shall be determined and documented by the Responsible Level 3 or NANDTB as defined within the employer’s written practice. Annex A recertification for the Responsible Level 3 shall be determined and documented by the employer.” [A.2.5]

- “A single event shall only be used for one award credit activity during a five year period.” [A.2.5]

- Activity point reductions and two new activities added.
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FAQ’s

Is an ASNT Certificate equivalent to NAS410 certification?

No. An ASNT Certificate may be used to fulfill the general examination requirement; however, complete compliance with NAS410 is necessary. [7.1.2]
Is it acceptable to administer a “closed book” specific examination?

No. The specific examination shall be an “open book” examination with reference material provided with 30 minimum questions that demonstrate an understanding of the reference material. [7.1.3]
Can my NAS410 certification for Employer A be transferred to my new Employer B?

No. NAS410 is employer based certification. Previous training and experience may be accepted by the current employer only if documented and approved by the Responsible Level 3 or Examiner. New examinations must be administered by new employer. [4.4]
For penetrant inspection, previous revisions of NAS410 specified 16 hours of formal training and current revisions specify 32 hours. Is it necessary to document additional training hours for a penetrant inspection recertification?

Yes. Previous and equivalent training must be documented to meet the minimum requirements of Table I of the current revision. Additional training may be necessary if determined by Responsible Level 3. [6.1.3]
FAQ’s

Radiographic personnel have been performing Digital Radiography for years prior to the release of NAS410 revision 4. Do these personnel require additional training and experience to revision 4?

Equivalent training per 6.1.3 and equivalent experience per 6.3.1 shall be determined and documented by the Responsible Level 3 to the minimum requirements.

[6.1.3 and 6.3.1]