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Staff Exhibit 4

U.S. NUCLEAR REGULATORY COMMISSION
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RULEMAKINGS AND
ADJUDICATIONS STAFF

Exelon Procedure TQ-AA-122, Rev 3; "Qualification and Certification of Nondestructive (NDE) Personnel"

Template = SECY-027

SECY-02

QUALIFICATION AND CERTIFICATION OF NONDESTRUCTIVE (NDE) PERSONNEL

1. PURPOSE

1.1. To establish requirements and administrative controls for the qualification and certification of Exelon Nuclear, Amergen Energy and PSEG (as applicable) personnel in nondestructive examination (NDE).

1.2. This procedure applies to all Exelon Nuclear, Amergen Energy and PSEG (as applicable) personnel certified or recertified in NDE. It shall also apply when Exelon Nuclear certifies Exelon personnel of other business units outside of Exelon Nuclear, or when Exelon Nuclear certifies contractor personnel who are in the temporary employ of Exelon Nuclear.

1.3. Certifications issued in accordance with earlier Exelon Nuclear, Amergen Energy, PSEG or their predecessor companies' certification procedures, shall remain valid until such time as recertification is required or they are revoked or terminated.

2. TERMS AND DEFINITIONS

2.1. **Certification** – Written testimony of qualification.

2.2. **Eddy Current Analyst (ET-A)** – An advanced progression of Eddy Current Testing (ET), which specializes in the evaluation of non-ferromagnetic heat exchanger tubing utilizing conventional and advanced techniques such as multiple frequency probes, motorized rotating pancake coils (MRPC), etc. Current certification in eddy current (ET) is a prerequisite to certification as an eddy current Analyst (ET-A).

2.2.1. **Eddy Current Testing (ET)** – A method of examination in which an alternating electrical (Eddy) current is induced in the part to be examined. Variations in the part such as a flaw or a change in thickness, cause a disruption in the induced current field and are displayed on a meter or cathode ray tube. Evaluation of displayed or recorded eddy current data, with the exception of ASME Section XI examination of steam generator tubing, is included in eddy current testing. Evaluation of steam generator examination data requires an additional Eddy Current Analyst (ET-A) certification.

2.3. **Magnetic Particle Testing (MT)** – A method of examination of ferromagnetic materials in which the part to be examined is magnetized and a fine metallic powder applied to the part accumulates at magnetic field disruptions caused by surface or slightly subsurface discontinuities.

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2.3.1. **Magnetic Particle Testing – Limited (MT-L)** – A limited sub-division of magnetic particle testing (MT), defined above. Restricted to the dry powder, color contrast, electromagnetic yoke technique only.

2.4. **Outside Agency** – An outside agency is an organization or individual that provides NDE Level III or NDE Instructor services and whose qualifications to provide these services have been reviewed and accepted by the organization that engages the outside agency.

2.5. **Penetrant Testing (PT)** – A method of examination utilizing the principle of capillary action of a liquid to draw a dye into discontinuities open to the surface of a part or component enhancing the appearance and detectability of a discontinuity.

2.5.1. **Penetrant Testing – Limited (PT-L)** – A limited sub-division of penetrant testing (PT), defined above. Restricted to the solvent removable, color contrast technique only.

2.6. **Procedure** – In nondestructive examination (NDE) a procedure is an orderly sequence of rules that describes how a specific technique shall be applied.

2.7. **Qualification** – The skill, training, knowledge, and experience required for personnel to properly perform the duties of a specific job, as demonstrated by compliance with Exelon Nuclear requirements for certification.

2.8. **Radiographic Testing (RT)** – An examination method that uses radiation to penetrate through the object being examined in order to record density contrasts on special film or other recording medium. Radiographic testing also includes the development of exposed film and the evaluation of developed film including all attributes of radiographic interpretation as defined below.

2.8.1. **Radiographic Interpretation (RT-I)** – A Limited sub-division of Radiographic Testing (RT) defined above, which is restricted to the examination of exposed and developed radiographic images to verify film quality, including densities, artifacts, penetrameters, geometric unsharpness, component ID, etc., and to evaluate radiographic images to determine the acceptability of examined components with respect to specified codes and standards.

2.9. **Technique** – A technique or category is a specific way of utilizing a particular nondestructive examination (NDE) method. Each technique or category is identified by at least one particular important variable from another technique or category within the method.

2.9.1. Applicable nondestructive examination (NDE) methods with associated techniques:

1. ET Method – Bobbin or Surface Techniques;
2. MT Method – Dry or Wet Techniques;
3. PT Method – Visible or Fluorescent Techniques;
4. RT Method – Single-Wall or Double-Wall;
5. UT Method – Angled or Straight Techniques;
6. VT Method – Direct or Remote Techniques;

2.10. **Ultrasonic Testing (UT)** - A method of examination in which high frequency sound waves are introduced into the component to be examined. Sound waves, which are reflected from discontinuities, or other interfaces, are displayed as indications, usually on a cathode ray tube.

2.10.1. **Ultrasonic Testing Longitudinal (UT-L)** – A limited sub-division of ultrasonic testing (UT), defined above, which is restricted to the use of 0 degree, straight beam transducers for thickness measurements or flaw detection.

2.10.2. **Ultrasonic Thickness Measurements (UT-M)** – A limited sub-division of ultrasonic testing (UT), defined above, which is restricted to the use of 0 degree, straight beam transducers for the sole purpose of determining thickness of materials and components.

2.11. **Visual Testing-1 (VT-1)** – A limited visual examination specific to ASME Section XI which is the observation of exposed surfaces of a part, component, or weld to determine its physical condition including such irregularities as cracks, wear, erosion, corrosion, or physical damage.

Note: Detailed Visual as the applicable requirements of ASME Section XI, 2001 Edition, Subsections IWE and IWL shall be contained in the VT-1 Method. The examiner certified to VT-1 shall also be certified to examine components specified to Detailed Visual. Detailed Visual shall be applied to Class MC containment surfaces; and Class CC concrete surfaces and anchorage hardware.

2.11.1. **Visual Testing – 1 Bolting (VT-1B)** – A limited sub-division of Visual Testing – 1 (VT-1) defined above, which is restricted to the examination of bolting components including bolts, studs, nuts, washers, etc., 2 inches and less in diameter.

2.11.2. **Visual Testing – 1 Concrete (VT-1C)** – A limited sub-division of Visual Testing – 1 (VT-1) defined above, which is restricted to the direct or remote examination of selected suspect areas of containment concrete surfaces.

2.12. **Visual Testing – Invessel Visual Inspection (VT-IVVI)**– A limited sub-division of Visual Testing – 1 (VT-1) defined above, and Visual Testing – 3 (VT-3) defined below, which is restricted to the remote or direct examination of reactor pressure vessel internal surfaces and components to determine their physical condition

including such irregularities as cracks, wear, loose parts, debris, and the loss of integrity at bolted or welded connections.

2.13. **Visual Testing – 2 (VT-2)** – A limited visual examination specific to ASME Section XI which is the observation to locate evidence of leakage from pressure retaining components, or abnormal leakage from components with or without leakage collection systems during a system pressure or functional test.

2.14. **Visual Testing – 3 (VT-3)** – A limited visual examination specific to ASME Section XI which is the observation to determine the general mechanical and structural condition of components and their supports, such as the verification of clearances, settings, physical displacements, loose or missing parts, debris, corrosion, wear, erosion, or the loss of integrity at bolted or welded connections. The VT-3 examinations shall include examinations for conditions that could affect operability of functional adequacy of snubbers, and constant load and spring type supports.

Note: General Visual as the applicable requirements of ASME Section XI, 1992 Edition, 1992 Addenda, Subsection IWE shall be contained in the VT-3 Method. The examiner certified to VT-3 shall also be certified to examine components specified to General Visual. General Visual shall be applied to Class MC pressure retaining components and their integral attachments; and Class CC metallic shell, penetration liners and their integral attachments.

2.14.1. **Visual Testing – 3 Concrete (VT-3C)** – A limited sub-division of Visual Testing-3 (VT-3) defined above, which is restricted to the direct or remote observation of coated and uncoated concrete containment structure and surfaces for evidence of conditions indicative of damage or degradation.

2.14.2. **Visual Testing – 3 Snubbers (VT-3S)** – A limited sub-division of VT-3 defined above, which is restricted to the examination of snubbers and their attachments.

3. RESPONSIBILITIES

3.1. Outage Services

3.1.1. Responsible for development, approval and implementation of this procedure.

3.1.2. Responsible for appointment of designated persons/positions to this procedure.

3.2. NDE Services Manager

3.2.1. Maintains certification records for each currently certified NDE Level III examiner.

3.2.2. Provides assistance to the Principal Level III in the administration of the NDE Program.

3.2.3. May perform the duties of the Principal Level III when designated.

3.2.4. Responsible for appointment of NDE Principal Level III.

3.2.5. Responsible for appointment of NDE Instructor.

3.2.6. Approves the use of contracted services for training and testing of NDE personnel.

3.2.7. Selects suitable NDE Level III candidates, evaluates their performance, training history and qualifies/certifies suitable individuals.

3.3. Principal Level III

3.3.1. A qualified individual appointed by NDE Services Manager.

3.3.2. This position is equivalent to the Principal Level III Examiner as specified in ASME Section XI, 1992 Edition with 1992 Addenda and later Editions.

3.3.3. May designate the Principal Level III position in an absence.

3.4. Responsible Individual

3.4.1. A qualified individual appointed by Corporate Asset Management to approve the applicable Visual Testing portions of this procedure ensuring the qualification/certification requirements of ASME Section XI, Subsection IWE, 1998 Edition are met for the Station(s) with an approved Relief Request through an authorized NRC SER.

3.5. Responsible Engineer

3.5.1. A qualified individual (Registered Professional Engineer experienced in evaluating in-service conditions of structural concrete) appointed by Corporate Asset Management to approve the applicable Visual Testing portions of this procedure to ensure the qualification/certification requirements of ASME Section XI are met.

3.6. NDE Level III Examiners

3.6.1. Develops, approves, administers, and grades, NDE qualification examinations for Level I and Level II personnel.

3.6.2. Evaluates NDE performance, training, and job experience of Level I and Level II candidates, and certifies suitable candidates.

3.6.3. May perform the duties of the Principal Level III when designated.

3.6.4. NDE Level III Examiners assigned to and responsible for the NDE program activities at a station shall maintain certification records for each currently certified NDE Level I and Level II examiner at the respective station.

3.7. NDE Instructors

3.7.1. Develops appropriate classroom and laboratory materials for initial and supplemental training of NDE Level I, II, and III personnel.

3.7.2. Conducts classroom and laboratory training sessions for all levels of NDE personnel.

3.7.3. Conducts classroom and laboratory testing sessions for all levels of NDE personnel.

3.7.4. Conducts qualification testing for all levels of NDE personnel.

4. MAIN BODY

4.1. Personnel Qualification

4.1.1 Personnel certified in nondestructive examination to this procedure are qualified in accordance with ASNT SNT-TC-1A, through 1984 Edition; ANSI/ASNT CP-189, 1991 and 1995 Editions; and ASME Section XI, 1986 Edition through 2001 Edition, 2003 Addenda, as applicable. 4.1.2. Personnel performing ultrasonic examinations to fulfill the requirements of ASME Section XI must also meet the requirements of the Appendix VII (Attachment 5 to this procedure).

4.1.3. As an alternative to the certification requirements contained in the main body of this III Examiner shall be qualified to, and be responsible for: procedure, personnel may be qualified to perform VT-2 examinations in accordance with Code Case N-546 and Attachment 6 to this procedure.

4.1.4. Other requirements, beyond those contained herein, may apply to specific examinations or certain examination types. Examples of this include the requirement to be Performance Demonstration Initiative (PDI) qualified to perform Section XI, Appendix VIII ultrasonic examinations, the NRC requirement for radiographers to be third party certified in radiation safety, or the requirement to be a Qualified Data Analyst (QDA) to perform evaluation of eddy current data of steam generator tubing.

4.1.4.1. Certification to this procedure is a prerequisite to the additional, supplemental qualifications described above.

4.1.5 There are four levels of qualification, which are defined in terms of the skills, knowledge, and experience required in a given method or methods to perform specified NDE activities.

4.1.5.1. NDE Level I – An NDE Level I Examiner shall be qualified to:

- **PERFORM** specific equipment set-ups

- **PERFORM** specific calibrations and examinations
- **RECORD** data to written instructions
- **IMPLEMENT** written NDE instructions under the guidance of a certified NDE Level II or III.

A. NDE Level I Examiners shall **not** independently **EVALUATE or INTERPRET** the results of a nondestructive examination.

4.1.5.2. NDE Level II – An NDE Level II Examiner shall be qualified to:

- **PERFORM** examinations
- **SET-UP and CALIBRATE** equipment
- **INTERPRET and EVALUATE** results with respect to applicable codes, standards, and specifications
- **REPORT** NDE results.

A. NDE Level II Examiners shall **BE** thoroughly **FAMILIAR** with the scope and limitations of the test method **and EXERCISE** assigned responsibility for the on-the-job training of trainees and NDE Level I examiners.

4.1.5.3. NDE Level III – An NDE Level

- **ESTABLISHING** examination techniques and procedures
- **INTERPRETING** codes, standards, specifications, and procedures
- **DESIGNATING** the particular test methods, techniques, and procedures to be used
- **RESPONSIBLE** for NDE operations for which qualified and to which assigned
- **INTERPRETING and EVALUATING** NDE results in terms of existing codes, standards, and specifications
- **QUALIFYING and CERTIFYING** Level I and Level II personnel for NDE certification.

A. NDE Level III Examiners shall have sufficient practical background in applicable materials, fabrication, and product technology to **ESTABLISH** techniques **and** to **ASSIST** in establishing acceptance criteria.

B. NDE Level III Examiners shall **EVALUATE** the adequacy of specific programs used to train and test inspection, examination, and testing personnel.

C. NDE Level III Examiners shall **EVALUATE** the experience history of lower level personnel and make recommendations for NDE certifications.

D. NDE Level III Examiners shall have a general **FAMILIARITY** with other appropriate NDE methods for which they are **not** certified.

4.1.5.4. NDE Instructor – An NDE Instructor shall have the skills and knowledge to **PLAN, ORGANIZE, and PRESENT** classroom, laboratory, demonstration, and/or on-the-job NDE instruction, training, and/or education programs in accordance with approved course outlines.

A. An NDE Instructor may administer qualification examinations, written and practical.

4.1.5.5 Trainee – While in the process of being qualified and certified to Level I, II or III, an individual shall be considered a Trainee. This is not a certification level, and a Trainee shall **WORK** at all times under the direction of a certified individual (NDE Level II or NDE Level III) and shall **not** independently **CONDUCT** examinations, **INTERPRET or EVALUATE** the results of an examination, **or REPORT** examination results.

4.2 Education, Training and Experience

4.2.1 All candidates for initial certification as an NDE Level I, Level II or Level III shall possess as a minimum, a High School Diploma or equivalent (GED).

4.2.2 Candidates for certification as NDE Level I, Level II or Level III shall complete sufficient organized training. This training shall be as follows:

- Training shall be conducted in accordance with a course outline approved by an NDE Level III. Additional training guidance is discussed in ER-AA-335-1002, NDE Training.
- Course shall include topics as listed in Appendix B of CP-189, SNT-TC-1A or ASME Section XI Appendix VII Supplement 1 for the appropriate NDE method, plus additional topics as deemed necessary by the NDE Level III.
- Sequence, content, amount of time spent, and depth of coverage for each topic shall be approved by an NDE Level III.
- Training programs shall include sufficient examinations to demonstrate necessary information comprehension. To receive credit for the training, the individual shall pass a final examination covering the topics contained in the training program.
- An NDE Instructor shall present the training, however, the NDE Instructor may delegate personnel with specialized expertise (metallurgists, engineers, NDE Level III and etc.) who are not certified to this procedure, but are subject matter experts (SME) in presentation of specific information. An NDE Level III shall in all cases be responsible for the content of the completed course.

4.2.3. NDE Level I and II personnel shall meet the minimum training and experience requirements listed for the method and level;

4.2.3.1. Attachment 1, Tables 1T, 2T, & 3T **LIST** the minimum training requirements for each NDE method and level.

4.2.3.2. Attachment 2, Tables 1E, 2E, & 3E **LIST** the minimum experience requirements for each NDE Method and level.

NOTE: Reference ATTACHMENT 6 for Station specific training/experience requirements for personnel certified VT-2 in accordance with Code Case N-546.

4.2.4. Candidates for initial certification to NDE Level I, Level II and Level III shall document sufficient experience in accordance with Attachment 8 – Documentation of Initial NDE Experience and Training.

4.2.5. Exelon may accept a candidate's previous training and experience, if verified and documented. Any claimed training or experience, which cannot be verified and documented, should be considered invalid. The NDE Level III responsible for certifying the candidate shall verify and validate the documentation for the minimum required training and experience in each method. This verification and validation may be documented on Attachment 8 – Experience Verification / Validation Record.

4.2.6. NDE Level III examiners shall **FULFILL** one of the following minimum criteria for education and experience:

4.2.6.1. **GRADUATED** from a 4-year accredited engineering science college or university with a degree in engineering or science, plus 1 year experience in nondestructive examination in an assignment comparable to that of an NDE Level II Examiner in examination method(s),

Or:

4.2.6.2. **COMPLETED** with passing grades at least the equivalent of 2 full years of engineering or science study at a university, college, or technical school, plus 2 years experience in an assignment comparable to that of a Level II Examiner in the examination method(s),

Or;

4.2.6.3. Have four years **EXPERIENCE** in an assignment comparable to that of a Level II examiner in the examination method(s).

Or:

4.2.6.4. POSSESSION of a valid, current, ASNT Level III certificate in a particular NDE method satisfies all of the above Level III Education, Training, and Experience requirements.

4.2.7. NDE Instructors shall **FULFILL** the following minimum criteria to be considered for appointment as an NDE Instructor:

4.2.7.1. **HOLD** a current Level III certification in the applicable NDE method, or have fulfilled the NDE Level III Basic and Method requirements of the applicable NDE Method;

and

4.2.7.2. **POSSESS** a current teacher or vocational instructor certificate issued by a state, municipal, provincial, or federal authority or have completed a minimum of 40 hours instruction in training and teaching techniques.

4.3. *Visual Acuity Examination*

4.3.1. All Examiners certified to NDE Level I, Level II, or Level III, shall be tested to assure minimum requirements for near vision acuity, far vision acuity, and color contrast differentiation, as described below.

1. ADMINISTER tests prior to certification and annually thereafter.

2. An NDE Level III or registered professional medical personnel shall ADMINISTER acuity examinations; or other qualified individuals designated and documented by the NDE Level III Examiner.

4.3.2. Minimum acceptable requirements for each vision test, natural or corrected, are:

1. Near Vision - The ability, in at least one eye, to read Jaeger number 1 on a standard Jaeger test at a nominal minimum distance of not less than 12 inches. **ADJUST** the actual test distance based on the results of measurements of the average lower case height of the test chart **and** shall **MEET** Figure 1 below:

FIGURE 1

Near Distance Acuity Test Distances And Character Heights

Test Distance Inches	Maximum Lower Case Character Height Inches
12	0.022
13	0.024
14	0.025
15	0.027
16	0.029

Note: The test distance (eye to chart) and corresponding character heights provide a visual angle of 6.25 minutes which is equivalent to a Snellen fraction of 20/25.

2. Far Vision – The ability, in at least one eye, to **DISCERN** Snellen fraction 20/30 symbols at a distance of 20 feet.

3. Color Contrast Differentiation – the ability to **DISTINGUISH** colors and

differentiate contrast between colors normally encountered in NDE shall be demonstrated by the capability of distinguishing various numerals and patterns on standard Ishihara Color Contrast Plates at a distance of less than 30 inches or equivalent (e.g. colored wire, colored yarn, etc.).

4.3.3. Attachment 7 to this procedure **PROVIDES** additional details and specific requirements in the administration of a vision examination.

4.4. NDE Qualification Examinations

4.4.1. **ADMINISTER** the written examinations without access to reference material (closed book), except that necessary data such as graphs, tables, specifications, procedures, and codes essential for test implementation, may be provided by the NDE Level III responsible for the administration of the test.

4.4.2. Randomly **SELECT** the required number of questions for each written examination from a question bank, which represents a cross section of the body of knowledge applicable to each method and NDE level.

4.4.2.1. INCLUDE the minimum number of questions listed in Attachment 3 in the written examinations for certifying NDE Level I and Level II personnel.

NOTE: Reference 'ATTACHMENT 6' for Station specific examination requirements for personnel certified VT-2 in accordance with Code Case N-546.

4.4.3 The format and content of the examinations for NDE Level I and II shall **CONSIST** of each of the following:

1. General (Written) examination **COVERS** the basic test principles relative to the applicable testing method, and to the extent commensurate with the NDE Level for which the examination is given.

2. Specific (Written) examination shall **COVER** the equipment, operating procedures, and testing techniques that the candidate may encounter in their specific assignment. The examination shall also **COVER** the codes, specifications, and acceptance criteria used by Exelon Nuclear in its NDE examinations.

3. Practical examination **REQUIRES** the candidate to demonstrate to the satisfaction of the Level III examiner that the candidate is familiar with and can calibrate and operate the necessary test equipment and record and analyze the resultant information to the degree required.

   Level I – The candidate shall **DEMONSTRATE** proficiency using the applicable NDE method to **EXAMINE** at least one test sample for each technique to be used in the candidate's job. The test samples shall be representative of the products that the candidate will encounter in performing the job function.

Level II – The candidate shall **DEMONSTRATE** proficiency by **PERFORMING** the applicable NDE method in examining at least one sample for each technique to be used in the candidates job, and a minimum of two samples per method and by interpreting, evaluating, and documenting the results of the examination. The test samples shall be representative of the product that the candidate will encounter in performing the job functions.

4.4.4 The format and content of the examinations for NDE Level III shall **CONSIST** of each of the following;

4.4.4.1. ***Basic (Written) examination*** shall **VERIFY** the candidates' knowledge of such diverse topics as materials processing and fabrication, administration of a Written Practice, and general knowledge of other NDE methods. This examination shall consist of at least 75 questions:

A. Minimum 10 (twenty to thirty percent of 50 for ASME Section XI) of the questions shall **COVER** ANSI/ASNT CP-189 and minimum 20 questions shall be related to the understanding the SNT-TC-1A document. The quantity of questions for understanding these two documents shall be a minimum of 30.

B. Minimum 15 (thirty to fifty percent of 50 for ASME Section XI) of the questions shall **COVER** other NDE methods and be similar to the Level II questions published by ASNT for the NDE methods referenced in ANSI/ASNT CP-189 and SNT-TC-1A. The quantity of questions for understanding these other methods shall be a minimum of 15.

C. Minimum 30 (twenty to thirty percent of 50 for ASME Section XI) of the questions shall **COVER** applicable materials, products, and fabrication technology for ASME Section XI and SNT-TC-1A requirements. The quantity for understanding these topics shall be a minimum of 30.

Note: The Basic is required only once if certification is sought in more than one method and/or the re-qualification method examination is successfully completed prior to the expiration (five years) of the initial qualification method examination.

4.4.4.2 ***Method (Written) examination*** shall **VERIFY** the candidate's knowledge of the basic fundamentals and principles of the method, and the use of applicable codes and procedures. It shall consist of at least 70 questions:

A. Minimum 13 (twenty to forty percent of 65 for ASME Section XI) of the questions shall **COVER** fundamentals and principles of the method and shall be similar to published ASNT Level III questions for ASME Section XI requirements and a minimum 30 shall cover the same for SNT-TC-1A/CP-189. The quantity for understanding these topics shall be a minimum of 30.

B. Minimum 20 (thirty to fifty percent of 65 for ASME Section XI) of the questions shall **COVER** applications and establishment of procedures and techniques

and shall be similar to published ASNT Level III questions for ASME Section XI requirements and a minimum 15 shall cover the same for SNT-TC-1A/CP-189. The quantity for understanding these topics shall be a minimum of 20.

C. Minimum 13 (twenty to thirty percent of 65 for ASME Section XI) of the questions shall **COVER** the capability to interpret codes standards and specifications for the method for ASME Section XI requirements and a minimum 20 shall cover the same for SNT-TC-1A/CP-189. The quantity for understanding these topics shall be a minimum of 20.

4.4.4.3. ***Specific (Written) examination*** shall **VERIFY** the candidate's knowledge of equipment, techniques, procedures, the NDE requirements of ASME Section XI, and administration of Exelon's written practice. It shall consist of at least 30 questions.

4.4.4.4. ***Practical examination*** shall **VERIFY** the candidate's ability to develop NDE procedures. The candidate shall **PREPARE** an NDE procedure appropriate to Exelon's needs; however if documented experience demonstrates that the candidate has previously prepared acceptable NDE procedures in the method using specifications codes, and standards that are applicable to Exelon, a practical examination is not required. If experience is substituted for the practical examination the pertinent practical experience shall be documented in the individuals' certification records file.

4.4.4.5. ***Demonstration examination*** shall **MEASURE** the candidates' ability to **PERFORM** examinations and evaluate examination results. The candidate shall **DEMONSTRATE** proficiency by performing the applicable NDE method in examining at least one sample for each technique to be used in the candidates' job, and a minimum of two samples per method and by interpreting, evaluating, and documenting the results of the examination. The test samples shall be representative of the product that the candidate will encounter in performing the job functions.

4.4.5. Controls to assure confidentiality of qualification test materials shall be **ESTABLISHED** to prevent unauthorized access to these materials. These controls shall include, as a minimum, locked file cabinets for hardcopy test questions banks, password requirements for computer based test question databanks, and locked cabinets for all practical test samples. Additional controls may be established as necessary to assure security of qualification test materials.

4.5. Administration and Grading

4.5.1. In <u>no</u> case shall any examination be **PREPARED or ADMINISTERED** by one's self or by one's subordinate.

4.5.2. An NDE Level III certified in the applicable method or an NDE Instructor shall be responsible for the **ADMINISTRATION and GRADING** of Level I and Level II qualification examinations. The administration and grading of examinations may be delegated.

4.5.3. The Principal NDE Level III or NDE Instructor is responsible for the **ADMINISTRATION and GRADING** of NDE Level III qualification examinations. This responsibility may be delegated by the Principal NDE Level III to an NDE Level III who is certified in the applicable method.

4.5.3.1. **BASE** initial certification on the Basic, Method, Specific, Practical, and Demonstration examinations. **If** the practical examination is waived based on documented experience, as described in 4.4.4(4), **then ASSIGN** an 80% for the examination **and USE** the 80% to calculate the composite grade.

4.5.3.2. **BASE** recertification of NDE Level III on Method, Specific, Practical, and Demonstration examinations. Alternatively, Level III personnel may be recertified using only the Method and Specific Examinations, provided the candidate was previously certified or recertified as an NDE Level III using the Written Examinations and Demonstration Examination (If a candidate has evidence of completing Level II Practical examinations, this satisfies the Demonstration examination), and further, that the candidate is not being recertified due to interrupted service as defined in 4.9.1.2.

4.5.3.3. An ASNT Level III certificate with a current endorsement for the applicable method satisfies the Basic and Method examination requirements.

4.5.4. **ADMINISTER** the Level I, II, III Practical examinations and the Level III Demonstration examination using a written checklist. The checklist shall address at least the following items:

4.5.4.1. The Level I Practical examination checklist shall **ADDRESS** proficiency in the use of techniques and equipment, proper adherence to procedure, test sequence, calibrations, materials, documentation, and extent of examination.

4.5.4.2. The Level II Practical examination checklist shall **ADDRESS** proficiency in the use of techniques and equipment, proper adherence to procedure, test sequence, calibration, and materials; satisfactory detection and location of discontinuities; proper extent of examination; and the accuracy and completeness of the activities and test results.

4.5.4.3. The Level III Practical examination checklist shall **ADDRESS** items relating to the technical and practical adequacy of the NDE procedure(s) prepared by the candidate.

4.5.4.4. The Level III Demonstration examination checklist shall **ADDRESS** proficiency in the use of techniques and equipment, proper adherence to procedure, test sequence, calibration, and materials; satisfactory detection and location of discontinuities; proper extent of examination; and the accuracy and completeness of the activities and test results.

4.5.5. **DETERMINE** the final grade for initial NDE certification by simple averaging of each applicable grade i.e.; General, Specific, and Practical for Level I and Level II, and

Basic Method, Specific, Practical, and Demonstration for Level III. The average grade must be at least 80%, and each individual exam grade must be at least 70%. For recertification, the grades of applicable examinations administered shall be averaged to determine the overall grade.

4.5.6. Outside agencies may be used to **ADMINISTER and GRADE** examinations.

4.5.6.1. When an outside agency administers an examination and only issues a pass or fail grade, **ASSIGN** an 80% for each pass grade issued.

4.5.6.2. **If** the outside agency requires a passing grade other than 70% for any individual examination, **then APPLY** the higher requirement.

Note: Each outside agency shall maintain a written practice that specifies the documentation to be maintained in the agency's qualification records. This documentation shall include such information as the qualification examinations, candidate's name and certification level, date of examination, overall course grade and formal qualification examination grade.

4.6. **Re-examination**

4.6.1. Candidates who fail to **ATTAIN** the required passing grade on a qualifying or re-qualifying examination must **RECEIVE** additional documented training, **or WAIT** at least thirty days for re-examination. This training shall **ADDRESS** the deficiencies, which caused failure. A candidate shall **not** be re-examined using the examination or specimen previously failed or both.

4.7. **Expiration**

4.7.1. Individual certifications shall **EXPIRE**;

4.7.1.1. When employment with the employer is terminated.

4.7.1.2. At the end of three years, for NDE Level I and NDE Level II individuals.

4.7.1.3. At the end of five years, for NDE Level III individuals.

4.7.2. **If** multiple test dates are utilized for any certification, **then DETERMINE** the expiration date from the date of the earliest individual examination used to support that certification.

4.7.3. An individual's NDE certification expiration shall be documented on Attachment 4 – NDE Certification Records, Continued Certification Record.

4.8. **Re-certification**

4.8.1. Re-certification of all Levels of NDE personnel shall be by **EXAMINATION**, as described in Section 4.4 of this procedure.

4.8.2. The re-qualification activities (i.e. general, method, basic, practical and demonstration examinations, as applicable) are intended to begin and be completed prior to the expiration date of the current certification period. When all re-qualification examinations are not completed prior to the previous certification period expiring, the new recertification period begins when the NDE Certification Record is completed and signed. No NDE examinations are to be performed between the dates of the expired certification and the new date of recertification.

4.9. **Suspension**

4.9.1. Exelon shall **SUSPEND** any individual's NDE certification if;

4.9.1.1. The vision examination interval exceeds one year. Certification is reinstated concurrently with passing the vision reexamination; **or**

4.9.1.2. The individual has interrupted service – meaning the individual has not performed examinations, or related duties (reviewed or generated procedures, drawings, work scope or participated in the review or supervision of the examinations), in the certified method(s) during any consecutive twelve month period; **or**

4.9.1.3. The individual's performance is determined to be deficient in the required method or technique for specific documented reasons.

4.9.2. An individual's NDE certification suspension shall be documented on Attachment 4 – NDE Certification Records, Continued Certification Record.

4.10. **Revocation**

4.10.1. Exelon shall **REVOKE** an individual's certification when;

4.10.1.1. The individual has **not PERFORMED** examinations, or related duties (reviewed or generated procedures, drawings, work scope or participated in the review or supervision of the examinations), in the method(s) for which certified during any consecutive twenty-four month period; **or**

4.10.1.2. The individual's conduct is deemed by Exelon to be or have been unethical or incompetent.

4.10.2. An individual's NDE certification revocation shall be documented on Attachment 4 – NDE Certification Records, Continued Certification Record.

4.11. **Reinstatement**

4.11.1. **DETERMINE** reinstatement of suspended NDE Level I or NDE Level II certifications by an NDE Level III. **DETERMINE** reinstatement of suspended NDE Level III certifications by the NDE Manager / Principal NDE Level III.

4.11.2. Reinstatement of expired or revoked NDE certifications shall only be through complying with the examination requirements of Section 4.4 of this procedure.

4.11.3. An individual's NDE certification reinstatement shall be documented on Attachment 4 – NDE Certification Records, Continued Certification Record.

4.12. **Continued Certification**

4.12.1. Continued certification documentation shall be prepared by the NDE certified individual and submitted to an NDE Level III or prepared by the station Level III prior to the Annual Review Due Date (Vision Acuity Verification expiration date). Upon acceptance, the certification shall be continued for one-year, which may be used to establish the new Annual Review Due Date.

4.12.2. The individual shall have continual satisfactory service – meaning the individual has performed examinations, or related duties (reviewed or generated procedures, drawings, work scope or participated in the review or supervision of the examinations), in the certified method(s) during the recent past twelve month period.

4.12.3. A suggested method of the Annual Review Due Date is that it may coincide with the date of the required vision acuity expiration date for the purpose of continued certification. The exception will be when the certification expiration date arrives prior to the vision acuity expiration date; hence, the Annual Review Due Date will coincide with the certification expiration date.

4.12.4. Continued Certification and the Annual Review Due Date shall be documented on Attachment 4 – NDE Certification Records, Continued Certification Record.

Note: This record and evidence of continuing performance is not applicable to VT-2 certifications acquired in accordance to ASME Code Case N-546.

5. DOCUMENTATION

5.1. **MAINTAIN** a qualification and certification file for each currently certified NDE examiner at each station. This file is a living (in-progress) file and shall **CONTAIN** as a minimum;

5.1.1. Certification Records

5.1.1.1. NDE Certification Record – Levels I & II or III from Attachment 4 – NDE Certification Records;

5.1.1.2. Name and Social Security Number (optional) of certified individual;

5.1.1.3. Educational background (verified during Initial Qualification and Certification);

5.1.1.4. NDE Method and Level of Certification, including applicable techniques and restrictions for limited certifications;

5.1.1.5. Test grades for each applicable qualification examination; results of all, and copies of the most recent employer examinations that the individual has taken or evidence

of successful completion of the examinations; (written examinations are maintained by the NDE Level III or NDE Instructor who administered the exams)

5.1.1.6. Other suitable evidence of satisfactory qualifications when such qualifications are used in lieu of examinations;

5.1.1.7. For Level III personnel, a copy of the candidate's ASNT Level III Certificate (if applicable).

5.1.1.8. Composite grade (simple average of all applicable exam scores);

5.1.1.9. Dates of certification and expiration along with dates of assignment to NDE;

5.1.1.10. Printed name and signature of Exelon authorized certifying individual;

5.1.1.11. Satisfactory continuing performance (documented on Attachment 4).

5.1.2. Training Documentation

5.1.2.1. Evidence of satisfactory completion of required NDE training. This may include course certificates, attendance sheets, etc., but must include dates and duration of applicable training, identification of organization providing training, name of instructor, and evidence of satisfactory completion.

5.1.3. Experience Documentation

5.1.3.1. Evidence of sufficient applicable NDE experience to support certification. This may include verified experience from previous employers, previous Exelon certification, experience logs, etc.

5.1.4. Visual Acuity Results

5.1.4.1. Copies of all applicable documentation of visual acuity examinations for the duration of the certification period.

5.2. Transmittal of NDE Certification Records

5.2.1. **Transmit** NDE certification records, paragraph 5.1.1 above, to Records Management when personnel have terminated employment, no longer active in any NDE method/technique, and when their three year or five year certification has expired. NDE certification records are transmitted to the Records Management in accordance with Records Management Program, RM-AA-101 and retained in accordance with the Standard Records Retention Schedule under Record Identification 3D.127.

6. REFERENCES

6.1. American Society for Nondestructive Testing, Recommended Practice, SNT-TC-1A, "Personnel Qualification and Certification in Nondestructive Testing" (through 1984

Edition).

6.2. ANSI/ASNT CP-189, "Standard for Qualification and Certification of Nondestructive Testing Personnel" (1991 and 1995 Edition).

6.3. ASME Boiler and Pressure Vessel Code, Section XI, 1986 Edition through 2001 Edition, 2003 Addenda, as applicable.

6.4. ER-AA-335-1002, Nondestructive Examination Training

6.5. RM-AA-101, Records Management Program

6.6. Standard Records Retention Schedule

7. ATTACHMENTS

7.1. Attachment 1 – Minimum Training Requirements for NDE Levels I & II:

Table 1T – Visual Methods;

Table 2T – Surface Methods;

Table 3T – Volumetric Methods.

7.2. Attachment 2 - Minimum Experience Requirements for NDE Levels I & II:

Table 1E – Visual Methods;

Table 2E – Surface Methods;

Table 3E – Volumetric Methods.

7.3. Attachment 3 – Minimum number Examination Questions for NDE Levels I & II.

7.4. Attachment 4 – NDE Certification Records:

Certification Record – Levels I & II;

Certification Record - Level III;

Continued Certification Record.

7.5. Attachment 5 - Supplemental Qualification Requirements for ASME Section XI, Ultrasonic Examination Personnel.

7.6. Attachment 6 – Alternate Qualification of VT-2 Examination Personnel.

7.7. Attachment 7 – Administration of a Vision Examination.

7.8. Attachment 8 – Documentation of Initial NDE Experience and Training.

ATTACHMENT 1
Minimum Training Requirements for NDE Levels I & II
Page 1 of 3

Table 1T – Visual Methods

NDE	Level I	Level II
VT-1, 2, & 3*	8 Hours	12 Hours
VT-1	3 Hours	4 Hours
VT-1B	1 Hour	1 Hour
VT-1C	2 Hours	2 Hours
VT-IVVI	2 Hours	2 Hours
VT-2	2 Hours	2 Hours
VT-3	5 Hours	6 Hours
VT-3C	2 Hours	2 hours
VT-3S	2 Hours	2 Hours

Individuals being certified directly to Level II, with no time at Level I, are required to meet the sum of the training time for Level I and Level II for the method.

* NOTE - VT-1, 2, & 3 are contained in a comprehensive course covering all aspects of Visual Examination. It includes all topics covered by each of the limited Visual Examination subdivisions listed above.

ATTACHMENT 1
Minimum Training Requirements for NDE Levels I & II
Page 2 of 3

Table 2T – Surface Methods

NDE	Level I	Level II
PT	8 Hours	8 Hours
PT-L	4 Hours	4 Hours
MT	12 Hours	8 Hours
MT-L	8 Hours	8 hours

Individuals being certified directly to Level II, with no time at Level I, are required to meet the sum of the training time for Level I and Level II for the method.

ATTACHMENT 1
Minimum Training Requirements for NDE Levels I & II
Page 3 of 3

Table 3T – Volumetric Methods

NDE	Level I	Level II
UT	40 Hours	40 Hours
UT-L	20 Hours	20 Hours
UT-M	8 Hours	8 Hours
RT	40 Hours	40 Hours
RT-I	8 Hours	24 Hours
ET	12 Hours	40 Hours
ET-A	10 Hours	24 hours

Individuals being certified directly to level II, with not time at Level I, are required to meet the sum of the training time for Level I and Level II for the method.

ATTACHMENT 2
Minimum Experience Requirements for NDE Levels I & II
Page 1 of 3

Table 1E – Visual Methods

NDE	Method Hours / NDE Hours Level I	Method Hours / NDE Hours Level II
VT-1, 2, & 3*	65 / 130	130 / 270
VT-1	25 / 50	50 / 100
VT-1B	10 / 20	20 / 40
VT-1C	10 / 20	20 / 40
VT-IVVI	10 / 20	20 / 40
VT-2	15 / 30	30 / 70
VT-3	25 / 50	50 / 100
VT-3C	10 / 20	20 / 40
VT-3S	10 / 20	20 / 40

Notes: 1) Individuals being certified directly to Level II, with no time at level I, are required to meet the sum of the experience time for Level I and Level II for the method.

2) While fulfilling total NDE experience requirement, experience may be gained in more than one method. Minimum experience hours must be met for each method.

3) * - Experience for simultaneous certification in VT-1, 2, & 3 includes all aspects of visual examination, and is not limited by specific minimums for any particular VT technique.

ATTACHMENT 2
Minimum Experience Requirements for NDE Levels I & II
Page 2 of 3

Table 2E – Surface Methods

NDE	Method Hours / NDE Hours Level I	Method Hours / NDE Hours Level II
PT	65 / 130	135 / 270
PT-L	20 / 65	65 / 130
MT	65 / 130	200 / 400
MT-L	35 / 65	75 / 150

Notes: 1) Individuals being certified directly to Level II, with no time at level I, are required to meet the sum of the experience time for Level I and Level II for the method.

2) While fulfilling total NDE experience requirement, experience may be gained in more than one method. Minimum experience hours must be met for each method.

ATTACHMENT 2
Minimum Experience Requirements for NDE Levels I & II
Page 3 of 3

Table 3E – Volumetric Methods

NDE	Method Hours / NDE Hours Level I	Method Hours / NDE Hours Level II
UT	200 / 400	600 / 1200
UT-L	50 / 100	100 / 400
UT-M	20 / 50	50 / 100
RT	200 / 400	600 / 1200
RT-I	25 / 50	75 / 200
ET	65 / 130	600 / 1200
ET-A	N/A	300 / 600

Notes: 1) Individuals being certified directly to Level II, with no time at level I, are required to meet the sum of the experience time for Level I and Level II for the method.

2) While fulfilling total NDE experience requirement, experience may be gained in more than one method. Minimum experience hours must be met for each method.

ATTACHMENT 3
Minimum Number of Examination Questions
Page 1 of 1

NDE	LEVEL I General	LEVEL I Specific	LEVEL II General	LEVEL II Specific
VT-1, 2, & 3*	30	20	40	25
VT-1	20	10	10	10
VT-1B	10	10	10	10
VT-1C	10	10	10	10
VT-IVVI	20	20	20	20
VT-2	10	10	10	10
VT-3	20	10	20	20
VT-3C	10	10	10	10
VT-3S	15	15	15	15
PT	30	20	30	15
PT-L	15	10	15	10
MT	30	20	30	15
MT-L	15	10	15	10
UT	40	20	40	20
UT-L	15	15	15	15
UT-M	10	10	10	10
RT	40	20	40	20
RT-I	20	20	20	20
ET	40	30	40	20

Note: * - Examinations for simultaneous certification in VT-1, 2, & 3 shall cover all aspects of visual examination technology. Questions shall be randomly selected from a data-bank, and shall include questions covering VT-1, VT-2, and VT-3.

ATTACHMENT 4
Certification Record – Level I & Level II
Page 1 of 3

Exelon Nuclear

NDE CERTIFICATION

NAME:

_____

METHOD and LEVEL:

_____

EXPERIENCE
PREVIOUS NDE EXPERIENCE:

_____

TRAINING

HOURS:	PROVIDED BY or INSTRUCTOR:	GRADE:
_____	_____	_____

EXAMINATION GRADES

GENERAL:	SPECIFIC:	PRACTICAL:	AVERAGE:
_____	_____	_____	_____

CERTIFICATION [ ] Initial or [ ] Requal.

DATE of CERTIFCATION:	EXPIRATION DATE:
_____	_____

The candidate has successfully completed training, experience and testing for certification to the employer's written practice, TQ-AA-122, latest revision.

CERTIFIED BY:

_____

Print / Sign / Date **Exelon Principal NDE Level III**

ATTACHMENT 4
Certification Record – Level III
Page 2 of 3

Exelon Nuclear

NDE CERTIFICATION

NAME: _____

METHOD and LEVEL: _____

EXPERIENCE

PREVIOUS NDE EXPERIENCE:

_____

TRAINING

HOURS:	PROVIDED BY or INSTRUCTOR:	GRADE:
_____	_____	_____

EXAMINATION GRADES

BASIC	METHOD	SPECIFIC	PRACTICAL	DEMO	AVERAGE
_____	_____	_____	_____	_____	_____

ASNT L/III Certificate No. _____ **(if applicable)**

CERTIFICATION [ ] Initial or [ ] Requal.

DATE of CERTIFCATION: _____ **EXPIRATION DATE:** _____

The candidate has successfully completed training, experience and testing for certification to the employer's written practice, TQ-AA-122, latest revision.

CERTIFIED BY:

_____

Print / Sign / Date **Exelon Principal NDE Level III**

ATTACHMENT 4
Continued Certification Record
Page 3 of 3

Exelon Nuclear

CONTINUED CERTIFICATION RECORD

NAME: _____ **NDE METHOD** _____
LEVEL: _____ **EXPIRATION DATE:** _____

Annual Review Date	Vision Acuity Examination Date	New Annual Review Due Date

NDE LEVEL III EVALUATION

☐ **Current:** All requirements for maintaining this certification have been met.

The individual shall have continual satisfactory service – meaning the individual has performed examinations, or related duties (reviewed or generated procedures, drawings, work scope or participated in the review or supervision of the examinations), in the certified method(s) during the recent past twelve month period.

☐ **Suspended:** The requirements for maintaining the certification have not been met due to:

☐ Vision Acuity Examination Record not current .

☐ No performance of NDE examinations or related duties.

- Not applicable to VT-2 certifications in accordance with Code Case N-546.

☐ **Terminated/Expired:** Certification voluntarily terminated and/or expiration date has been exceeded.

☐ **Revoked:**

Reason_____

IR Number:_____

☐ **Reinstated:** See Certification Record (Level I, II or III).

NDE Level III Acceptance /
Date:_____

ATTACHMENT 5
Supplemental Qualification Requirements for ASME Section XI, Ultrasonic Examination Personnel
Page 1 of 7

1. **Purpose**

1.1. To establish supplemental requirements for qualification and certification of personnel who perform ultrasonic examinations to fulfill the requirements of ASME Section XI, Appendix VII.,1.1.1. In conjunction with the base document, TQ-AA-122, this attachment meets or exceeds the requirements of the referenced editions of ASME Section XI, Appendix VII.

1.1.2. Personnel certified to this attachment shall fulfill all certification requirements for the appropriate level (i.e.; I, II, or III) of ultrasonic examination (UT) of the base document, TQ-AA-122.

1.1.3. Where requirements contained in this attachment conflict with those in the base document, TQ-AA-122, such as training hours, the more stringent requirements contained herein shall apply.

2. **Terms and Definitions**

2.1. Same as base document, TQ-AA-122

3. **Responsibilities**

3.1. Same as base document, TQ-AA-122

4. **Main Body**

4.1. Personnel Qualification

4.1.1. Same as base document, TQ-AA-122

4.2. Education, Training, and Experience

4.2.1. Candidates for certification shall complete sufficient organized initial training to become thoroughly familiar with the theories, principles, and practices of ultrasonic examination. This training shall, as a minimum, cover the topics listed in the training outlined attached as ER-AA-335-1002.

ATTACHMENT 5
Supplemental Qualification Requirements for ASME Section XI, Ultrasonic Examination Personnel
Page 2 of 7

1. Minimum initial training hours for both classroom and laboratory shall be as follows:

INITIAL TRAINING HOURS
(Classroom / Laboratory)

Level I	Level II	Level III
40 / 40	40 / 40	40 / 0

General Notes:

a. To certify a candidate directly to Level II with no time at Level I, the total hours of training required for Level I plus Level II shall apply.

b. To certify a candidate directly to Level III with no time at Level I or Level II, the total hours of training required for Level I plus Level II plus Level III shall apply.

c. Industrial or academic training courses covering the topics listed of ER-AA-335-1002 may be credited toward the training required for Level III personnel.

d. The hours of instruction devoted to each subject in ER-AA-335-1002 shall be determined by the NDE Instructor.

2. For individuals who have been previously qualified to Level I or Level II under a written practice that did not include the additional requirements of Appendix VII, additional training shall be required prior to requalification if the individual has not completed the cumulative hours of training in the ultrasonic method required by the above chart for the applicable Level of qualification.

   a. The individual's training, including the additional training required in 4.2.1.2, shall cover the topics listed in the ER-AA-335-1002 for the applicable Level of qualification.

   b. Prior documented training that addressed the topics covered in ER-AA-335-1002 may be credited for each individual. The credited training shall be subtracted from the requirements of the above chart and ER-AA-335-1002 to determine the hours and topics, respectively, to be covered in additional training. An NDE Instructor shall conduct the additional training.

3. If a qualification examination for certification is not given at the conclusion of training, a final course examination shall be given. A grade of 70% is necessary to receive credit for the training hours.

4. If an individual fails a final course examination, additional remedial training is required prior to reexamination. The additional training shall address the areas of weakness exhibited by the individual and shall be documented by the NDE Instructor.

ATTACHMENT 5
Supplemental Qualification Requirements for ASME Section XI, Ultrasonic Examination Personnel
Page 3 of 7

4.2.2. Each certified individual shall receive a minimum of 10 hours of supplemental training each year. This training shall convey knowledge of new developments, material failure modes, and other technical topics pertinent to Exelon's NDE program. A record of attendance and the topics covered during the training shall be maintained. No examination is required.

1. As an alternate to the annual training requirements described above, individuals who are Appendix VIII (PDI) qualified may utilize the semi-annual, 8 hours of hands-on practice from the PDI Program to fulfill all Appendix VII annual training requirements. This is described in ASME Code Case N-583. This alternate is only applicable for use at plants, which have received permission to use this alternate.

4.2.3. The minimum experience time, in hours, required for initial certification to each level shall be as follows:

Required Experience for Initial Certification
for Ultrasonic Examination (Hours)

Level I	Level II	Level III
250	800	4,200 / 2,100 (Option 1)
		6,300 / 4,200 (Option 2)
		8,400 / 4,200 (Option 3)

General Notes:
a. For Level II certification, the experience shall consist of time at Level I. To certify a candidate directly to Level II with no time at Level I, the total experience hours for Level I plus Level II shall apply
b. When exercising the option for Level III (e.g., Option 1: 4200 / 2100), the first figure specifies the required total experience. The second figure specifies the amount of experience that shall be in nuclear applications. Prior certification as a Level I or Level II is not required.

1. The three experience options identified in 4.2.3 for initial Level III certification are as follows:

a. OPTION 1 - Graduate of a 4 year accredited engineering or Science College or university with a degree in engineering or science, plus 2 years experience in NDE in an assignment comparable to that of an NDE Level II in the ultrasonic examination method. At least 1 year of this experience shall be in nuclear applications and shall include the actual performance of examinations and the evaluation of examination results.

ATTACHMENT 5
Supplemental Qualification Requirements for ASME Section XI, Ultrasonic Examination Personnel
Page 4 of 7

b. OPTION 2 – Completion with a passing grade of at least the equivalent of 2 full years of engineering or science study at a university, college, or technical school, plus 3 years experience in an assignment comparable to that of a Level II in the ultrasonic examination method. At least two years of this experience shall be in nuclear applications and shall include the actual performance of examinations and evaluations of examination results.

c. OPTION 3 – High school graduate, or equivalent, plus 4 years experience in an assignment comparable to that of Level II in ultrasonic examination method. At least 2 years of this experience shall be in nuclear applications and shall include the actual performance of examinations and evaluation of examination results.

4.3. Visual Acuity Examination

4.3.1. Same as base document, TQ-AA-122

4.4. NDE Qualification Examination

4.4.1. For each written examination administered as part of the qualification examination, a "question bank" containing at least twice the minimum number of questions required per examination shall be available. Qualification examinations shall be assembled from the question bank using a random selection process.

4.4.2. For each Practical Examination that does not use specimens prepared for UT performance demonstration (i.e., Appendix VIII) and is administered as part of the qualification examination, a "specimen bank" containing at least five flaws shall be available. Grading units as defined in Appendix VIII, may be used to produce the specimen bank. The flaws in the specimen bank shall be simulated flaws not exceeding the standards of ASME Section XI, IWB-3500, actual flaws, or a mixture of both. The specimen or grading unit set for each Practical Examination shall be assembled from the specimen bank using a random selection process. Blank (unflawed) test specimens shall be included in the specimen set so that no more than one-third of the specimens or grading units in the set contain flaws required to be detected. The specimens or grading units shall be masked such that flawed and blank specimens or grading units cannot be identified and the flaw locations are not visible.

1. The specimen set assembled for each practical examination shall not contain specimens, which had been used by the candidate(s) for training.

ATTACHMENT 5
Supplemental Qualification Requirements for ASME Section XI, Ultrasonic Examination Personnel
Page 5 of 7

4.4.3. Level I and Level II General Examinations

1. The General examination shall be a written, closed book examination containing a minimum 40 questions. The examination shall cover the technical principles relative to the ultrasonic (UT) method.

4.4.4. Level I and Level II Specific Examinations

1. The Specific Examination shall be a written examination containing a minimum of 40 questions. Necessary data such as graphs, tables, specifications, procedures, and Codes shall be furnished.

2. Forty to 60% of the specific examination questions shall cover Section XI NDE requirements. The remaining questions shall cover procedures and specifications applicable to the UT method.

4.4.5. Level I and Level II Practical Examination

1. Candidates shall demonstrate to the satisfaction of a Level III that they are familiar with and can perform the applicable UT examinations using suitable calibration blocks and written UT procedures prepared for examination of plant components.

2. The practical examination shall include examination of a specimen set that complies with Paragraph 4.4.2 of this attachment.

3. An assessment report containing at least ten checkpoints shall be used to evaluate the candidate's performance using longitudinal and shear wave techniques. The following check points shall be included:
   a. scanning technique;
   b. equipment set-up and calibration;
   c. selection of search unit;
   d. data recording (Level I and II);
   e. NDE report (Level II);
   f. evaluation in terms of the recording criteria.

4. A description of the specimens and the calibration blocks, the procedures used, the assessment report, and the examination report prepared by the candidate shall be retained as part of the certification records.

5. Alternately, successful completion of an UT performance demonstration in accordance with ASME Section XI, Appendix VIII (i.e., PDI) may serve as this Practical Examination and fulfill all requirements of paragraph 4.4.5.

ATTACHMENT 5
Supplemental Qualification Requirements for ASME Section XI, Ultrasonic Examination Personnel
Page 6 of 7

4.4.6. Level III Qualification Examinations

1. The Level III Examinations shall be in accordance with the requirements of the base document, TQ-AA-122 except:

   a. The Demonstration Examination shall meet the requirements for the Level II Practical Examination in paragraph 4.4.5 of this Attachment.

   b. The Specific Examination shall be at least 30 questions. Forty to 60% of the questions shall cover Section XI UT examination, evaluation, and acceptance criteria.

   c. The Basic and Method Examination shall be administered and graded by an outside agency.

   d. The Specific, Practical, and Demonstration Examinations shall be approved, administered, and graded by a Level III employed by an outside agency or Exelon.

4.4.7. Grading of Examinations

1. A passing grade of 80% is required for each examination.

2. The Level I and II Practical Examinations and the Level III Demonstration Examination shall be graded such that failure to accurately detect, locate, interpret, evaluate, or record, as applicable for the examination, 80% of the known conditions in the test specimen set shall cause the candidate to fail the examination. In addition, a maximum false call rate of 10% shall be imposed. (i.e., no more than 10% of the blank test specimens shall be reported as flawed).

4.4.8. Reexamination

1. Those individuals failing to pass a qualification examination shall receive additional training as determined by a Level III. This determination shall be based on the topics or subjects on which the individual failed to obtain a passing grade.

2. No individual shall be administered the same written examination more than once. Each reexamination, whether due to an insufficient grade or routine requalification, shall be selected at random and shall contain a minimum of 40% new or revised questions.

ATTACHMENT 5
Supplemental Qualification Requirements for ASME Section XI, Ultrasonic Examination Personnel
Page 7 of 7

3. The Practical or Demonstration Examination test specimen set shall contain at least 50% different flaws from those used during the most recent Practical or Demonstration Examination that was not passed by the candidate.

4. No individual shall be reexamined more than twice within any consecutive 12 month period.

4.4.9. Interrupted Service

1. Personnel who have not performed the duties associated with their certification level during any consecutive 12 month period shall be considered to have interrupted service and shall be required to successfully complete a Practical Examination (Level I and II personnel) or Specific Examination (Level III personnel) to assure continued proficiency prior to further assignment to perform NDE. The results of this examination shall be documented and maintained as part of the individual's certification record.

5. Documentation

5.1. The following additional information shall be maintained in an individual's certification record to satisfy the requirements of this Attachment:

5.1.1. Educational background of the individual

5.1.2. Record of annual supplemental training

5.1.3. Description of the specimens and calibration blocks, the procedures used, the assessment report, and the examination report prepared by the candidate for the Practical Examination (Level I and II) or the Demonstration Examination (Level III)

6. Reference

6.1. ASME Code Case N-583, "Annual Training Alternative"

7. Attachments

7.1. None

ATTACHMENT 6
Alternate Qualification/Certification of VT-2 Examination Personnel
Page 1 of 5

1. **Purpose**

1.1. To establish the requirements for qualification/certification of personnel in accordance with ASME Section XI and Code Case N-546, "Alternate Requirements for Qualification of VT-2 Examination Personnel".

1.2. This qualification/certification is specific to a Station only and should not be transferred between Stations unless there is an approved SER covering multiple stations.

1.3. This attachment applies to all Exelon Personnel who perform VT-2 examinations, other than those qualified and certified in accordance with the base document, TQ-AA-122. Personnel who are certified Level II or Level III in VT-2, in accordance with the base document fulfill all requirements of this attachment.

2. Terms and Definitions

2.1. Qualification – The characteristics or abilities gained through education, training, and experience, as measured against established requirements, such as standards or tests that verify an individual's ability to perform a required function.

2.2. Visual Testing – (VT-2) – The observation to locate evidence of leakage from pressure retaining components, or abnormal leakage from components with or without leakage collection systems, during a system pressure or functional test.

2.3. NDE Level III – An individual certified Level III in VT-2 in accordance with the base document, TQ-AA-122.

3. Responsibilities

3.1. Same as base document, TQ-AA-122.

4. Main Body

4.1. Personnel Qualification

4.1.1. Same as base document, TQ-AA-122.

4.1.2. VT-2 Level II shall be the only level of qualification.

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Alternate Qualification/Certification of VT-2 Examination Personnel
Page 2 of 5

4.1.3. While in the process of being qualified to VT-2 Level II, an individual shall be considered a Trainee. A Trainee shall work under the direction of a qualified individual and shall not independently conduct any tests, interpret or evaluate the results of a test, or report test results.

4.1.4. VT-2 Level II personnel shall be qualified to: perform examinations; set-up and calibrate equipment; interpret or evaluate results with respect to applicable codes, standards, and specifications; and organize and report on examinations. VT-2 Level II personnel shall be thoroughly familiar with the scope and limitations of the examination method and shall exercise assigned responsibility for on-the-job training of Trainee personnel.

4.2. Training and Experience

4.2.1 This qualification is in accordance with the specific Station Program plans.

4.3. Visual Acuity Examination

4.3.1. Same as base document, TQ-AA-122

4.4. Qualification Examination

4.4.1. This qualification is in accordance with the specific Station Program plans.

4.5. Grading

4.5.1. A candidate shall score a minimum grade of 80% or greater to be considered for qualification.

4.6. Reexamination

4.6.1. Personnel who fail to attain the required minimum grade on the qualifying examination may be reexamined after waiting at least one month or after having received suitable additional training as determined by the NDE Level III.

4.7. Expiration

4.7.1. This certification is in accordance with the specific Station Program plans.

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Alternate Qualification/Certification of VT-2 Examination Personnel
Page 3 of 5

4.8. Requalification

4.8.1. This certification is in accordance with the specific Station Program plans.

4.9. Suspension

4.9.1. An individual's qualification will be suspended if his/her visual acuity examination interval exceeds one year.

1. The qualification is automatically reinstated, concurrent with the candidates' successful completion of the vision examination.

4.9.2 The individual's performance is determined to be deficient in the required method or technique for specific documented reasons.

4.10. Termination

4.10.1. Exelon will terminate an individual's qualification when:

1. The individual leaves the active employment of Exelon.

5. Documentation

5.1. A qualification file shall be maintained for each VT-2 Level II examiner currently qualified in accordance with this attachment. This file shall contain the following information as a minimum:

5.1.1. Qualification Record, including

1. Name and Social Security Number (optional) of qualified individual
2. NDE Method and Level of Qualification (i.e., VT-2, Level II)
3. Final examination grade
4. Date of Qualification
5. Printed name and signature of Exelon authorized qualifying individual

ATTACHMENT 6
Alternate Qualification/Certification of VT-2 Examination Personnel
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5.1.2. Training Documentation

1. Evidence of satisfactory completion of the required classroom training. This may include course certificates, attendance sheets, etc., but must include dates and duration of applicable training, identification of organization providing training, name of instructor, and evidence of satisfactory completion.

5.1.3. Experience Documentation

1. Evidence of sufficient applicable plant or related experience to support qualification. This may include verified experience from previous employers, previous Exelon certification, experience logs, etc.

5.1.4. Visual Acuity Results

1. Evidence of current, satisfactory visual acuity examination.

6. <u>References</u>

6.1. Same as base document, TQ-AA-122.

6.2. ASME Code Case N-546, "Alternate Requirements for Qualification of VT-2 Examination Personnel.

7. <u>Attachments</u>

7.1. Exhibit 1 – VT-2 Qualification Record

ATTACHMENT 6
Alternate Qualification/Certification of VT-2 Examination Personnel
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EXHIBIT 1 – VT-2 CERTIFICATION RECORD

Exelon Nuclear

VT-2 CERTIFICATION

NAME:

_____

The individual named above is qualified as a Level II Examiner in Visual Testing-2 (VT-2). This certification is in accordance with the alternate requirements for qualification of VT-2 Examination personnel established in TQ-AA-122 and ASME Boiler and Pressure Vessel Code Case N-546.

METHOD and LEVEL: VISUAL TESTING (VT-2) - Level II

APPLICABLE PLANT & NDE EXPERIENCE:

_____

_____

TRAINING:

HOURS:	INSTRUCTOR:	GRADE:
_____	_____	_____

DATE of CERTIFICATION: _____ **EXPIRATION DATE:** _____

CERTIFIED BY: _____

Exelon NDE VT-2 Level III

ATTACHMENT 7
Administration of a Vision Examination
Page 1 of 6

1. Purpose

1.1. To establish requirements and administrative controls to verify and document natural or corrected near distance visual acuity, far distance visual acuity, and color contrast vision.

1.2. This Attachment fulfills the requirements of ASME Boiler and Pressure Vessel Code, Section XI (1998 and earlier Editions), ASNT SNT-TC-1A (through 1984 Edition) and ANSI/ASNT CP-189 (1991/1995 Edition) for visual acuity verification

1.3. This Attachment applies to all certified Exelon and Amergen personnel who perform nondestructive examinations required by Standards, Codes, or Procedures. It may also be used to verify the visual acuity of vendor NDE personnel.

2. Terms and Definitions – None

3. Responsibilities

3.1. NDE level III or his designated representative is responsible for:

3.1.1 Administration of near distance visual acuity, far distance visual acuity, and color contrast examinations.

3.1.2 Completion of Visual Acuity Verification form, Exhibit 1 to this Attachment, for all personnel completing the visual examination.

3.2. The NDE Level III is responsible for:

1. Indoctrination of designated individuals who may administer vision examinations to this Attachment. Such indoctrination shall be documented on the Designated Examiner Indoctrination form, Exhibit 2 to this Attachment

3.3. Licensed medical professionals, i.e., Physician, Registered Nurse, Physician's Assistant, etc., may also administer these examinations. Medical personnel do not require the indoctrination described in 3.2.1.

4. Main Body

4.1. Prerequisites

4.1.1. Equipment

ATTACHMENT 7
Administration of a Vision Examination
Page 2 of 6

1. A near distance test chart, such as a Jaeger Chart or equivalent, meeting the following qualification requirements:

   a. A measurement of test chart characters shall be made once before initial use, with an optical comparator (10X or greater) or other suitable instrument, to verify that the height of a representative lower case character, without an ascender or descender (i.e., a, c, e, o,), is within the range of Table 1. This measurement shall be documented and traceable to the test chart.

TABLE 1

Test Distance (in.)	Max. Lower Case Character Ht. (in)
12	0.022
13	0.024
14	0.025
15	0.027
16	0.029

Note: The test distance (eye to chart) and corresponding character heights provide a visual angle of 6.25 minutes, which is equivalent to a Snellen fraction of 20/25.

2. Ishihara color contrast plates, or equivalent.

3. A standard Snellen test chart, or equivalent

4.2. Instructions

4.2.1. Vision examinations shall be administered to the individual in well-lighted surroundings.

4.2.2. Personnel shall demonstrate natural or corrected near-distance acuity of 20/25 or greater Snellen fraction, with at least one eye by reading the words or identifying characters on a near distance test chart described in 4.1.1.1. The chart shall be used at a minimum distance appropriate for the measured character size of the chart.

   1. Other tests which yield an equivalent measure of near distance acuity may be used.

4.2.3. Personnel performing visual examinations shall demonstrate natural or corrected far-distance acuity at a distance of 20 feet, of 20/30 or greater Snellen fraction or equivalent with at least one eye.

ATTACHMENT 7
Administration of a Vision Examination
Page 3 of 6

4.2.4. Personnel shall demonstrate the capability to distinguish the colors applicable to the NDE methods for which certified and to differentiate contrast between these colors. If Ishihara Color Contrast Plates are used, they shall be viewed at a distance of less than 30 inches.

1. A deficiency in the ability of an individual to distinguish contrast or color shall be noted on the test record. The NDE examiners ability to perform and pass the practical examinations is satisfactory evidence to distinguish contrast.

4.2.5. Based on the results of the individual's vision examination, the applicable test results box on the visual acuity verification form (Exhibit 1 to this Attachment) shall be marked, and the form signed by the vision examiner.

4.2.6. Individuals may be re-evaluated at any time, at the discretion of their supervision or the NDE Level III, to assure an individual's continued ability to meet the minimum requirements.

4.3. Effective Period

4.3.1. The effective period of vision certification shall be for a maximum of one year.

5. Documentation

5.1. A written report shall be completed for each vision examination administered and shall include at least the following;

5.1.1. Identification, including name and social security number (optional), of the individual being tested.

5.1.2. Chart number or other identification, traceable to the initial measurement of the test characters.

5.1.3. The vision examination requirements.

5.1.4. Examination test results, which shall note whether the individual requires eye correction.

5.1.5. Date of examination

5.1.6. Identification of the NDE Level III, designated representative, or licensed medical person administering the examination.

5.2. The Visual Acuity Verification form, Exhibit 1 to this Attachment, may be used to fulfill the requirements of Section 5.1 and subsequent subsections of this Attachment. Other vision forms may be used provided the minimum information above is recorded.

ATTACHMENT 7
Administration of a Vision Examination
Page 4 of 6

5.3. When an NDE Level III provides indoctrination to a designated representative in the administration of visual acuity examinations it shall be documented and shall include the following information as a minimum:

5.3.1. Printed name and signature of the Designated examiner

5.3.2. Date of indoctrination

5.3.3. Signature of NDE Level III providing the indoctrination.

5.4. The Designated Examiner Indoctrination form, Exhibit 2 to this Attachment, may be used to fulfill the requirements of Section 5.3 and subsequent subsections of this Attachment.

6. <u>References</u>

6.1. Same as base document, TQ-AA-122.

6.2. American Society for Nondestructive Testing, Recommended Practice, SNT-TC-1A, "Personnel Qualification and Certification in Nondestructive Testing" (through 1984 Edition)

6.3. ANSI/ASNT CP-189 "Standard for Qualification and Certification of Nondestructive Testing Personnel" (1991 and 1995 Edition)

7. <u>Attachments</u>

7.1. EXHIBIT 1 – "Visual Acuity Verification" Form

7.2 EXHIBIT 2 – "Designated Examiner Indoctrination" Form

ATTACHMENT 7
Administration of a Vision Examination
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EXHIBIT 1 – VISUAL ACUITY VERIFICATION FORM

Visual Acuity Verification

For NDE Examiners

NAME:_____ **DATE:**_____

CHART NO.:_____

The above individual was examined on the above date for visual acuity. This Examination fulfils the minimum requirements defined in Exelon Procedure # TQ-AA-122, and verified the following qualifications:

1. Natural or corrected near distance acuity, in at least one eye, of 20/25 or greater Snellen fraction.

2. The ability to distinguish colors applicable to the NDE method and to differentiate contrast between these colors.

3. Natural or corrected far distance acuity, in at least one eye, of a Snellen fraction of 20/30 or equivalent.

TEST RESULTS

[ ] Individual meets requirements without correction

[ ] Near Vision
[ ] Far Vision

[ ] Individual meets requirements, but must use correction for;
[ ] Near Vision
[ ] Far Vision

[ ] Individual does not meet requirements

This Verification expires:_____

Examination Administered By:_____

Comments / Deficiencies:_____

_____

ATTACHMENT 7
Administration of a Vision Examination
Page 6 of 6

EXHIBIT 2 – DESIGNATED EXAMINER INDOCTRINATION FORM

Visual Acuity

Designated Examiner Indoctrination

Name:_____ **Date:**_____

The individual named above received indoctrination in the requirements for the administration of a vision examination on this date. This indoctrination required the designated examiner to demonstrate, to the NDE Level III, his / her ability to administer a vision examination meeting the requirements of TQ-AA-122, and in accordance with Attachment 7 of that Procedure.

Signature of NDE Level III:_____

Signature of Designated Examiner:_____

ATTACHMENT 8
Documentation of Initial NDE Experience and Training
Page 1 of 5

1. Purpose

1.1. To establish appropriate guidelines and administer controls to assure proper documentation of initial NDE work experience and training.

1.2. This attachment provides a method of documenting required NDE experience and training used for initial qualification and certification of NDE personnel to the Base Document, TQ-AA-122. Once certification to Level II is successfully completed in a method, the hourly documentation of experience is no longer required.

2. Terms and Definitions – None

3. Responsibilities

3.1. NDE Examiners or candidates are responsible for:

1. Completion of NDE Monthly Experience Record.
2. Tabulation of applicable hours for specific NDE disciplines and for total NDE experience time.

3.2. First line supervisors (if applicable) of NDE Examiners or Candidates are responsible for:

1. Review and approval of completed NDE Monthly Experience Record for subordinate personnel.

3.3. NDE Level III is responsible for:

1. Review of completed and approved NDE monthly experience records.
2. Completing the Experience Verification / Validation Record for initial certification.

4. Main Body

4.1. NDE Examiners and candidates shall enter each day's applicable NDE work experience on the NDE Monthly Experience Record, Exhibit 1 to this Attachment, or equivalent and forward completed forms to their supervisor and NDE Level III for review and approval.

4.2. The following are examples of specific NDE related job duties for that may be claimed as NDE experience and which will be credited towards required totals for NDE certification:

1. Actual field and lab experience in the performance of NDE examinations.

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Documentation of Initial NDE Experience and Training
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2. Preparing, instructing, or assisting in the instruction of NDE training classes.

3. Reviewing data packages from previous NDE examinations.

4. Writing or revising NDE procedures.

5. Demonstrating and qualifying NDE procedures.

6. Reviewing / interpreting Code requirements.

7. Reviewing / preparing drawings and sketches pertaining to NDE equipment, calibration blocks, examination areas, etc.

8. Building / designing NDE equipment and other related examination material.

9. Performing tests and examinations to determine the feasibility of various NDE methods and equipment.

10. Operating equipment for mechanized NDE.

11. Calibration or verification of NDE.

12. Installing and removing mechanized NDE devices.

13. Writing NDE Plans.

14 Monitoring / oversight of NDE Contractor Services.

15. Preparing reports related to NDE.

4.3. Attendance at training in a specific NDE discipline shall not be claimed as NDE experience toward certification in that discipline, but may be included toward the total NDE experience required.

4.3.1. Such training time shall be entered on the appropriate space on the experience record and shall be followed by a (T), denoting it as training time. This time shall not be added to the specific method / discipline accrual total for certification in that method but may be included in the overall total NDE experience hours.

5. <u>Documentation</u>

5.1. Completed NDE Monthly Experience Records, Exhibit 1 to this Attachment, or equivalent shall be kept in the individuals' certification file.

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Documentation of Initial NDE Experience and Training
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6. References

6.1. American Society for Nondestructive Testing, Recommended Practice, SNT-TC-1A, "Personnel Qualification and Certification in Nondestructive Testing" (through 1984 Edition).

6.2. ANSI/ASNT CP-189, "Standard for Qualification and Certification of Nondestructive Testing Personnel" (1991 and1995 Edition).

6.3. ASME Boiler and Pressure Vessel Code, Section XI, Same as Base Document

7. Attachments

7.1. EXHIBIT 1 – "NDE Monthly Experience Record"

7.2. EXHIBIT 2 – "Experience Verification / Validation Record"

ATTACHMENT 8
Documentation of Initial NDE Experience and Training
Page 4 of 5

EXHIBIT 1 – NDE MONTHLY EXPERIENCE RECORD

NDE Monthly Experience Record

Name:_____ **Month:**_____ **Year:**_____

HOURS

DATE	ET	MT	PT	RT	UT	VT-(1, 2, 3)
METHOD TOTALS:						

Supervisor:_____ **NDE Level III:**_____

ATTACHMENT 8
Documentation of Initial NDE Experience and Training
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EXHIBIT 2 – EXPERIENCE VERIFICATION / VALIDATION RECORD

Name:_____

Method_____ **Level**_____

EDUCATION

- ☐ **High School Diploma or General Education Document (GED)**
- ☐ **Associates Degree**
- ☐ **Bachelors Degree**

TRAINING

Institution	Date(s)	Hours/Months

EXPERIENCE

Employer	Date(s)	Hours/Months

STATEMENT

The below NDE Level III attests to verifying / validating the above information by telephone, mail and/or fax. The verification / validation documents are attached and are a part of the certification file.

NDE Level III:_____ **Date:**_____