



SETTING THE STANDARD

ANDE-1

ASME Nondestructive

Examination and Quality Control

Qualification and Certification

Standard

NDTMA 2015 Conference
Las Vegas, NV
February 11, 2015

Michael L. Turnbow
Chairman, ANDE Committee

Presentation Outline

- Why ANDE?
- ANDE Approach
- How does ANDE differ?
- Personnel Certification Program Features
- Who participates with ANDE?
- Status
- Conclusions

Why ANDE?

Industry events, 30 years of round robin studies and recent operating experience indicates industry action needed to improve the performance and reliability of non-destructive examination and inspection.

NDE Issues Overview

- Decline in qualified workforce due to attrition
- Increasing demand of qualified workforce due to aging plant issues and competing industries
- Variations in owner qualification and certification
- Human performance issues
- Existing personnel qualification and certification (PQ&C) processes do not align with INPO guidelines and best practices used for other nuclear power plant workers

ANDE Overview

- **Scope of Work**
 - To develop an independent third-party centralized certification program and supporting training for non-destructive examination and quality control inspection personnel contributing to development of a high performing workforce
- **Development project includes two parallel activities**
 - ANDE Personnel Certification program development
 - ANDE Training program development

ASME NDE (ANDE) Workforce Development Approach

- Responding to needs identified by industry and regulator
- Third party certification alternative to owner-based NDE personnel certification in ASME codes
- Program features consistent with personnel certification best practices including INPO Guidelines
- Initial focus on immediate needs of Nuclear industry; address high level priorities first – Ultrasonic Testing
 - Other NDE and QC methods will follow
- Will comply with 3rd party NDE Certification Organization requirements of Section XI code case
- Portable personnel certification credential
- Address training needs concurrently, but maintains independence
- ANDE is another option to the NDE certification and it's criteria could potentially be adopted by ASME codes

ASME Nondestructive Examination (ANDE) Initiative

- Develop a new standard implementing Systematic Approach to Training (SAT), Performance Based, and Psychometric principles
- Develop training, experience and assessment requirements through job task analysis (JTA) with subject matter experts (SME)
- Utilize JTA to develop:
 - standard descriptive experience requirements specified in qualification cards
 - Training content (on-line and classroom/lab)
 - centralized examination data base through psychometrics
 - standard performance based practical examinations with realistic flawed samples simulating field conditions
- Written and practical examinations will be administered by ASME as a certification body, in accordance with the ANDE-1 standard.
- Establishes a standard process of evaluation while assuring program integrity
- Practical exams will be administered via Authorized Test Centers.
 - Other options being considered: shippable practical exams at vendors/utilities with oversight by authorized nuclear in-service inspection agencies (ANII)

ASME Personnel Certification Program Features

- Traditional ASME Volunteer Committee/Stakeholders establish the certification standard using ANSI accredited procedures (ANDE Committee)
- Independent job-specific assessment of an individual's level of qualification
Standardized and secure written/practical exams utilized for assessment
- Psychometric practices applied for validity, reliability, and fairness
- Certification is independent of training
- Documented training and experience prerequisites
- Knowledge and skills examinations will be administered by ASME as an independent third-party standard process assuring program integrity
- ASME credentials (certificates) are issued to personnel passing the assessments
- Certification is time limited; renewal requirements measure or enhance continued competence
- Considering multiple options for delivery of written assessments including centralized testing centers and utility/vendor locations

How is ANDE different?

- Performance/Experience based vs. Time based
 - Qualification Cards
- Third Party written and practical exams
 - Based on JTA
 - Psychometrics
- Training developed in accordance with INPO Guidelines
- INPO SAT Process (Continuous Improvement) allows feedback from field performance for training and exam improvement
- Specific SIS Committees
- Instructor requirements/qualifications
- Provisional Certification
- Maintenance of certification

Performance vs. Time

- Qualification/Continuity card
 - required to take practical exam
 - Individual has to demonstrate they are proficient in the method (signed off by an ANDE Level III)
 - One method to maintain certification
 - Annual qualification/continuity card submission

Maintenance of Certification

- Uninterrupted service
 - annual documentation of uninterrupted service in the method
 - renewal requires practical reexamination every 5 years
- Qualification/Continuity card
 - requirements for maintenance of competency are documented annually (qualification/continuity card)
 - requires annual reduced scope practical
- If either of the above is not maintained a written and full practical exam is required to be recertified

ANDE Eligibility

- Written Exam
 - Education
 - HS Diploma or equivalent
 - Training
 - Document training for the each method including any endorsements being sought
- Practical Exam
 - Eye Exam
 - Document a current eye exam for initial certification only
 - Experience
 - Qualification/Continuity card (signed off by ANDE Level IIII) for each method

ASME Non-Destructive Examination (NDE) and Quality Control (QC) inspection personnel certification (ANDE)

- NDE Certifications
 - Ultrasonic
 - Radiographic
 - Magnetic particle
 - Liquid penetrant
 - Visual
 - Eddy Current
- QC Inspection Certifications
 - Mechanical
 - Civil
 - Electrical
 - Instrumentation & Controls
 - Welding
 - Receipt

Who participates?

- ASME*
 - Nuclear Codes & Standards
 - Technology & Personnel Certification
 - Training & Development
 - ASME Standards Technology, LLC
 - Government
 - US NRC*
 - Utilities
 - Tennessee Valley Authority*
 - FirstEnergy Nuclear Company *
 - Southern Nuclear Company*
 - Constellation Energy*
 - Component manufacturers
 - Insurance inspectors
 - Consultants
 - Design/construction services
 - Testing services
 - Academia
 - EPRI
- * - Sponsor

Industry, Academia and Government Join Forces to Address NDE/QC Workforce and Performance Issues

- Associates Degree Program
 - In the late 2000's Industry and Chattanooga State Community College (CSCC) joined together to design and implement a program to meet industry's increasing high demands.
 - In August 2013, after 3 years of graduating students, the program received accreditation from the Accreditation Board for Engineering and Technology (ABET). This is the first and only NDE/QC program accredited by ABET in the US.
- Technician Training and Certification Program
 - In 2012, as a result of cooperation between Industry, ASME and CSCC, the Department of Labor (DOL) awarded a \$1.5M grant to CSCC for the development of a NDE/QC technician training and certification program.
 - The program is being developed in accordance with INPO guidelines and industry best practices.
 - At the completion of development, industry audits and assessments will be conducted to assure continuous improvement.

ANDE Program Status

- An ASME national standard “ANDE-1” for the central certification of NDE/QC personnel is in its final stages of approval. The standard includes requirements for education, training, experience and assessment utilizing INPO guidelines and best practices.
- Practical demonstration test pieces have been designed by a special industry task group. Pacific Northwest National Laboratory (PNNL) assisted in determining the appropriate number of test pieces and flaws that would allow the measurement of Probability of Detection (POD).
- Written UT examination questions have been developed and are being reviewed by the ANDE Subcommittee on Testing.
- The UT and QC Mechanical/Common JTA’s have been approved by the ANDE Committee. Other NDE/QC JTA’s are near completion and ready for ANDE Committee approval.
- The UT Qualification Card is in for subcommittee review/approval. Other NDE/QC methods are in development.

Conclusions

- Improved training and experience followed by performance demonstration in accordance with industry best practices and INPO guidelines will result in high performance and reliability
- Consolidates multiple qualification requirements into a single credential that could be recognized by a code and/or regulator
- Establishes a consistent level of performance expectation with examinations effectively and efficiently delivered through ASME as an independent third party
- A single all inclusive web based credential will simplify recognition of certification for vendors, utilities, inspection agencies, and regulators by eliminating costly redundant documentation that adds no value
- Centralized certification provides a means to incorporate operating experience