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ISO 9712

From the common basis to specific applications

A vision for the qualification and certification of NDT personnel

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What we will cover



1

Situation

The state of the art and
the challenge ahead



2

Posing the problem

Personnel certification vs.
NDT system qualification



3

Proposing a solution

A dual scheme: common
basis + specific
applications



4

Conclusions & discussion

What is necessary —
and what remains open

Why this vision matters more than ever



ISO 9712:2021 now in force

The 2th edition replaces ISO 9712:2012: clarified responsibilities across bodies and employers, revised renewal process.... The ICNDT Guide was updated in 2024.



NDT 4.0 has arrived

AI-assisted defect recognition, robotics, digital twins and simulation / AR-VR training are reshaping the technician's role — exactly the shift anticipated and presented in 2017.



An ageing, mobile workforce

Around a third of the certified workforce is set to retire within a decade, while skills move across borders — sharpening the need for harmonised, interoperable certification.

Bottom line: the idea of using the operating authorisation as proposed in 2017 is now both more feasible and more urgent.

State of the art — and the challenge



The need

- Optimise maintenance to improve both the reliability and the competitiveness of plant operation
- Licensees / End Users need confidence that inspection results are reliable
- Qualified NDE systems — including personnel — must be re-implemented with the same demonstrated reliability
- The emphasis: reliability and ease of implementation, at a reduced cost



The challenge

- Innovation is paving the way for the deployment of new techniques
- Everyone feels the need for a single, harmonised certification scheme
- Some certifications pursue commercial objectives, or employers transfer their responsibility onto certification bodies
- Risk of shortages of experienced personnel and an increasingly mobile workforce
- Vendors see repeated qualification as a costly, bureaucratic hurdle with limited feedback

Two different things — often confused

Qualification of the Personnel



Qualification of NDT System

ISO 9712

Personnel certification

- Centralised system ensuring homogeneous practices
- Qualifies and certifies the workforce for a method or technique — an assessment of a person's basic knowledge.

Limits to watch

- Some certifications (TOFD, PA, DR) are not available in all countries and depend on the application or equipment
- Under the ISO/IEC Guide 21 mechanism, whole sections could be modified — risking the standard being read as a recommendation

ENIQ / EMQ · FD CEN TR 14748

System qualification

Establishes the ability of a specific examination system — equipment, procedures, sometimes personnel — to be fit for purpose with deliveries: TJ, standalone Procedure, Training Dossier and SQEP (Suitably Qualified Experienced Personnel)

Note: In CEN TC 138, we are launching the revision of the FD CEN TR 14748 " Methodology of the qualification of NDT System".

Specialisation outpaces a one-size scheme



With evolving technologies, tomorrow's NDT operator must be a cut above yesterday's standard — and technicians are becoming more specialised.



Fit for purpose

Generalists may suffice in some sectors, but now in some sectors such as Nuclear in-service inspection, demonstrated competence — fit for purpose — must come to the fore.



Procedure-specific techniques

Specific techniques often depend on the equipment of the service provider responsible for the development of the NDT system.
Is a third-party organization truly the best solution for verifying operator competence for implementing during ISI?
What would be the plus value of the Third party when, for an ISI NDT system, different techniques for detection, characterization, and sizing are applied using in-house equipment?



Inconsistency across Europe

Approaches to maintaining proficiency and requalification differ. The resulting gaps are a barrier to translating qualifications across borders.

A harmonised Third-Party basic certification



Personnel certified for the basic knowledge by a Third Party, in accordance with ISO 9712 — ruling out the modifications allowed under ISO/IEC Guide 21.



Confidence & interoperability

Convergence lets vendors trust that certified staff hold a broad knowledge of NDE methods — enabling international interoperability.



Fewer trade barriers

Consistent certification requirements for the personnel coupled with employer-job specific training on NDT system deployment would reduce international trade barriers and simplify supply chains.



Assess the basics

Certification assesses basic knowledge of a method or technique a person may implement — not for a single specific deployment.



Avoid proliferation

Resist the demand for ever-more-specific certifications, which only raises exam-failure risk for staff applying techniques in a specific context not to mention the difficulties in justifying the practice time required to maintain certification and the lack of volunteers as examiners.

Job specific Training for specific applications



The employer's Written Practice

For specific applications, the employer establishes a Written Practice governing training, assessment and authorization to operate taking into account basic and specific knowledge for the deployment of their own NDT Systems and on-site monitoring.

Skills come not only from the classroom but from laboratory tests defined in a training dossier and from on-the-job training.

The Written Practice should include

- ✓ A description of each certification level held
- ✓ The training, experience and examination undergone to reach it
- ✓ General responsibilities attached to the level
- ✓ The industry sector and NDE method certified for
- ✓ A database of all job-specific training completed
- ✓ A database of experience
- ✓ Authorization-to-operate documentation

THE PROPOSED SCHEME

One dual system, two complementary pillars



PILLAR 1

Common basis

Third-Party certification — ISO 9712

Basic knowledge · harmonised · centralised ·



prerequisite



PILLAR 2

Specific applications

Operating Authorization issued by the employer

Written Practice · training dossier · fit for purpose · fully auditable

THE OUTCOME



Controlled cost



Confidence in results



Workforce interoperability

4 • CONCLUSIONS

What is necessary — and what remains open

1 A harmonised basic certification

ISO 9712 assures licensees and vendors of the operator's proficiency, at an acceptable cost.

2 Employer-assured specific training

Vendors maintain proficiency through a Written Practice in their QA system, built on a training dossier produced while the development, qualification and monitoring of the NDT system's deployment on site..

3 Qualification of NDT System

Why do we need qualification or a performance demonstration for a (new) NDT system?

To verify that the method is **usable, reliable**, and meets the requirements for defect detection, with the specified measurement uncertainties and sensitivity margin (industrial conditions)

Just an example of the necessity: “**NDT inspection of welds on small-diameter tubes: evaluation of the capabilities of phased array ultrasonic testing (PA-UT) in lieu of radiography (RT) – GENSIP interlaboratory trial (UK) – 2015: very poor results despite certified operators!!!!**”

Hence the need to update the FD CEN/TR 14748:2005 standard "Methodology for qualification of non-destructive tests" in order to take into account the advent of AI, robotics, etc.



Still open

How do we harmonise employer authorization and monitor specific training through a third-party body — while protecting the intellectual-property rights on NDT systems developed for specific clients?

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Your thoughts?

Toward a shared European approach to maintaining operator proficiency and enabling workforce interoperability.

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This presentation reflects the author's approach as a basis for discussion among European partners.