

PORTUGUESE INDEPENDENT SCHEME FOR NDT PERSONNEL CERTIFICATION

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Abstract: Considering the absence of an independent certification body in Portugal for the certification of NDT personnel in the late 90's and also the increasing requirements of the Portuguese industrial companies in this field, the main NDT inspection services companies joined efforts within their association Relacre to create a certification system. The referred system as to meet the requirements of the European Standard EN 473.

This presentation introduces the prior situation of non-independent based systems, the creation of the independent scheme and the actual situation.

The NDT Certification Scheme is now accredited according to the EN 45013 standard and RELACRE is also a Recognised Third Party Organisation as described within the European Pressure Equipment Directive.

Introduction: As in many countries all over the world, the development of NDT certification schemes in Portugal, has been based on SNT-TC-1A, the well known ASNT recommendation. Some companies, mostly in the 70's, have created their own internal certification schemes. The demand for certified personnel increased mostly in larger companies, manufacturing equipment and components for Power Plants, Ship building and maintenance, Aircraft construction and maintenance. Firms supplying NDT and Inspection services felt also the growing need of personnel certification.

In the early 80's, Portugal decided to join the nuclear energy producer group of countries. This was a great challenge for the NDT Portuguese community. A consensual decision was never achieved and a few years later, this scenario was definitively put aside.

It was, probably, during this decade that the NDT personnel attained their highest number. In the following years, some of the larger companies employing NDT technicians, started to reduce their demand and some of them disappeared. Even without a precise evaluation of the size of the NDT community, we do have, for sure, in Portugal less NDT technicians now than in the eighties. By then, the large manufacturing companies had their own internal certification schemes governed by Level 3's nominated by the employer, according to their experience and technical competence.

Some specific contract requirements, asking for independent certification of Level 2's and 3's, were fulfilled by examinations in other European certification bodies.

NDT inspection suppliers offered their internal certification scheme to other companies, mainly to those, which did not have the means to create their own schemes. So, in the 90's the situation was:

- 1) The number of NDT candidates to certification was decreasing. Consequently, the number of potential candidates was not attractive to create a Certification Body. Round figures pointed to less than 200 candidates, performing basically PT, MT, RT and UT.
- 2) Otherwise, contracts requiring independent certified personnel was growing, particularly after the issue of EN 473:1993.
- 3) Inspection bodies accredited according to EN 45001/ ISO 17025 were being pressed to have their own personnel certified according to EN 473.
- 4) Specific requirements were coming up, such as PED 97/23/CE.

Results: The certification body was created and accredited according to EN 45013. From 2001 on, a series of examinations were conducted. Now, there are always at least two dates each year (typically April and October). However, if there are enough candidates, other dates can be agreed. Table 2 below, shows the actual total number of certificates issued since then.

	PT		MT		RT		UT		Totals
	Level 1	Level 2	Level 1	Level 2	Level 1	Level 2	Level 1	Level 2	
2001	1	18	0	0	4	13	0	3	39
2002	1	5	0	12	5	9	0	11	43
2003	0	18	0	5	11	10	0	4	48
2004	0	0	0	6	0	1	0	6	13
Total	2	41	0	23	20	33	0	24	145

Table 2 – Total number of certificates issued

In March 2004, there were 62 technicians certified in level 2, 15 certified in level 1 and 6 certified in both level 1 and 2. Total 83 certified.

Meanwhile, two other certification programs were developed. The certification of personnel in radiographic interpretation and in ultrasonic thickness measurement. Examinations were already performed in these specialities.

Discussion: The organisations most affected by the absence of an independent system were the NDT inspection bodies. The demand came both from clients and accreditation authority.

Those NDT inspection bodies have their quality system accredited by the Portuguese Institute for Quality (IPQ) according to ISO 17025. They had their level 3 technicians certified according to EN 473 by other European certification organisations.

However, no level 1's and 2's were certified by independent certification bodies, apart from very few exceptions (certified abroad).

During 1999, these NDT companies decided to set up the basis of a future national independent certification scheme. Several contacts were made and an initial technical committee was created. The initiative was coordinated by RELACRE, the national association of accredited laboratories. The experience of the level 3's that joined the committee was crucial. They were certified by the main certification bodies of France, England and Spain and used their experience to define, create and implement the new system.

The objective was always to try to implement the best practices in order to build a sound and solid system allowing recognition both in Portugal and abroad. The system was favoured also by a solid knowledge of quality assurance principles, very important in system design and compliance to EN 45013 (the European Standard for Personnel Certification Systems).

Considering the needs and the reality of Portuguese industrial NDT applications, it was decided to begin only with one industrial sector (Metal Manufacturing) and with the four most popular methods, Penetrant Testing, Magnetic Particle Testing, Radiographic Testing and Ultrasonic Testing.

Pre-Requirements

Some requirements had to be met, namely:

- 1) A low cost system. The statement of not providing training, in order to maintain the desired independence, reduced considerably the potential incomes resulting from the activity. Only certification was provided.
- 2) A strong, respected and recognised system
- 3) The capacity to comply with the increasing needs regarding NDT personnel certification of Portuguese industrial companies according to EN 473
- 4) An accreditation body that would meet the requirements of EN 45013

Along more than one year, major efforts were made in order to design, develop and put in place a system that could comply with the EN 473 requirements, allowing the first examination in March 2001.

After that, the new challenge was to get the accreditation. This came out in March 2003. Soon after, Relacre Certification Body was considered to meet the requirements applicable to recognised bodies performing NDT certification of personnel under PED

Strong points of the system

1) Independence

The only activity of the organisation is to run NDT examinations. No training activities are carried out.

2) Specimens for practical examinations

Since the beginning, special attention was given to the importance of practical examination. Considering the difficulty of having specimens with known defects with the assurance of valid results, it was decided to get them from specialised companies in this particular field. An investment was then made, and examination specimens were brought from England, produced in a specialised company

3) Grading of practical examinations

Special attention was also given to this issue, basically regarding reproducibility and repeatability. The results of practical examinations should be the same regardless of examiner and the timing. A very detailed matrix was created minimising the possibility of significant differences in results from different examiners or occasions. Moreover, any examination is to be always appreciated by two different examiners. The table below illustrates, per method, the number of check points that are object of evaluation in practical examination:

PT		MT		RT		UT	
Level 1	Level 2	Level 1	Level 2	Level 1	Level 2	Level 1	Level 2
30	60	29	59	33	84	42	72

Table 1 – Number of check points to be evaluated in practical examination

4) System permanent evolution. Adjustments are made from experience retrieved from examinations, always confirmed by different level 3s, with different NDT backgrounds.

Training

Since the beginning, the certification body stated the principle of not overcoming the border between training activities in the NDT field and examination. Therefore only examinations are performed.

The required training can be obtained inside companies with internal or outsourced monitors. Special contribution is being provided by the Lisbon engineering school (Instituto Superior de Engenharia de Lisboa) in the last 15 years, in NDT training, with a discipline exclusively dedicated to this subject. This is a unique contribution at university level to the NDT community and a source of divulgation close to future mechanical engineers. Not only presenting the basis of the most used methods but also updating information about, both EN 473 and ASNT based certification schemes.

It is also a decisive contribution for a new generation of Portuguese certified level 3 technicians.

Conclusions: At present, the system is in its fourth year of regular examinations and the next steps are expected to be:

- 1) Consolidation of the system, specifically introducing new specimens and increasing the number and diversity of examination questions.
- 2) Introduction of level 3 certification
- 3) Examination in other methods
- 4) Extension to other industrial sectors
- 5) Contacts with EFNDT

