

# CERTIFICATION OF N. D. T. OPERATORS

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**SUMMARY:** *Description of the French certification system; comparison between useful certification systems of other countries, look to the future.*

## 1. INTRODUCTION

One of the most important activities of the COFREND-Comite Francais des Essais non Destructifs (NDT French Committee) is certification of personnel performing NDT operations.

As the French certification system is now in full operation since almost two years, we think that it is interesting to.

- describe the French certification system.
- compare this one to some others certification systems currently applied.
- look to the future.

## 2. COFREND AND NDT PERSONNEL CERTIFICATION SYSTEM

### 2.1 Motivation to the French certification system

To arrive at a right understanding of the present organization of the COFREND and of the French certification system, it's necessary, first of all, to recall some points of history.

The COFREND, with its previous structural organization, was founded in 1967, on the one hand by the "Societe Francaise de Metallurgie" (French Society of Metallurgy), on the other hand by the "Societe des Ingenieurs Soudeurs" (Welding Engineers Society) and the "Institut de Soudre" (Welding Institute). Under the chairmanship of well known professor Paul Bastien were assembled all physical members of these founder Societies concerned by NDT technics. These members, all engineers, worked to resolve NDT problem in different Commissions created by the COFREND, in function of necessity.

In so manner, the COFREND has created, in 1971, the Commission 6 which was in charge of the definition of tasks and proficiencies about personnel performing NDT operations, and consequently of the definition of suitable educational programs.

Very quickly, on the request of several members working in heavy industry, this Commission looked to the establishment of the French certification system separate from the ASNT system.

In 1973, works were undertaken, very hardly, by this Commission who widened to other members including the "Direction de la Qualite et de la Securite Industrielle"

at "Ministere de l' Industrie" and several French inspection agencies and classifying Societies.

The establishment of the French certification system meets needs felt by the employers or users of NDT personnel and the COFREND, through the work of the Commission 6, replied to all wishes in establishing the system now in operation.

The certification system of the COFREND is not exclusively a creation by the French spirit. Because many industrial firms or organisms had privity in deed, since 1968, to follow the SNT-TC-1A recommendations, the American pattern is subjacent.

However, without the desire to own a national system, whose the control can be national and whose the texts can be understandable by all people, there were deep reasons to give to the French system some specific characteristics separating it sharply from the American system.

In U.S.A, the ASNT system allows the employer to certify their Level I and Level II individuals, according to recommended practices concerning mainly training, experience and examination; these ones being managed by a Level III individual. Furthermore, certification of Level III individual by ASNT is only voluntary, this certification can be issued by the employer with or without exam. This liberal system is usually accepted by all users or authorities. As you know, for instance, the ASME Code accept this certification way in any case unless the nuclear Section III pronounces these recommended practices as mandatory and requires certification of Level III individual with exam. The possible misuses that this certification system can be possible to initiate and which it's possible to think with the latin of thinking, are avoided, hardly in USA, by the action of Authorized Inspection Agencies. For instance, in the event of violation, an industrial Society can fall the ASME stamp.

But there is not an equivalent policy measure, generally in Europe and particularly in France.

Therefore, against this American decentralization placed generally under control, it was necessary to create, in France, a more centralized structure to insure fully against abuses.

Concurrently it has occurred, as highly suitable, to have the presence of government representative in the French certification scheme for a more secure guarantee. If this idea is not new but yet applied in the Japanese certification scheme, it has entailed the restructuration of the COFREND to give it statute to allow the government representative to have a seat.

To avoid that any change can disturb the organization of the Eight World Conference on Non Destructive Testing in France, the COFREND "new formula" is borned only on September 30 / 1977 delaying the starting point of the certification system.

## **2.2 General Organization of the COFREND**

It's necessary to describe briefly the present organization of the COFREND be-

cause this one has weighed on the Certification system.

Presently, the COFREND is a federation of nonprofit Societies or Associations constituting members.

The members, without limitation of number, are now 40 including.

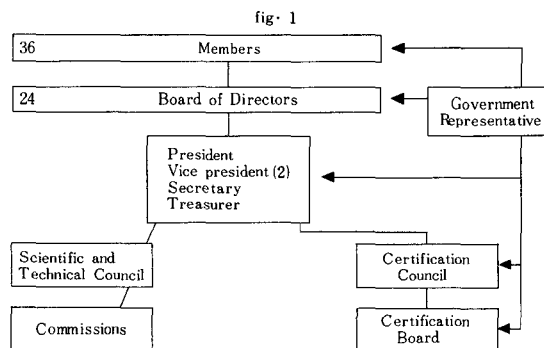
- technical associations
- research laboratories
- professional syndicates
- inspection societies
- nationalized or public societies
- army laboratories or inspection services
- etc.

If the COFREND accepts associate members (for instance foreign similar society: ABENDE being the first one), only members can vote during ordinary or extraordinary general meetings where each member must designate its permanent representative with one or two assessors.

This specific organization structure is very important because, by the nature of its members, the COFREND covers practically all industrial activities in France. It offers a wide information possibility very often crossed.

The Board of Directors (fig.1), including only 24 elected members, must designate, every year, by voting:

- president
- vice president (2)
- secretary
- treasurer



The activities of the COFREND are distributed into two organisms:

“Certification Council” (CCC) with an executive

“Certification Board” (CCB) .

The chairmen of these two councils and the manager of this board are designated by voting by the Board of Directors.

It's very important to notice that the government representative designated directly by the Ministry of Industry has a seat by right in the Board of Directors, Scientific and Technical council, Certification Council and Certification Board, and

can veto all decisions if he judges these ones against the French laws or against the national interest.

### **2.3 Scientific and Technical Council - Connection with Certification Scheme.**

The Scientific and Technical Council is constituted by all members of the CO-FREND concerned by scientific or technical problems. This Council manages works executed by Commissions created by it in function of needs.

Among eight Commissions actually in operations, two are directly in connection with Certification scheme:

#### **2.3.1. Commission 6 : Education, Training and Certification**

This Commission is working exclusively for the certification scheme through the Certification Council and the Certification Board and on the request of these ones. individuals issued from Societies or Associations members of the COFREND.

At first, this Commission has established the general rules of certification. These rules were applied in the beginning of 1978 when the Board of Directors approved them.

Furthermore, they have formed the subject of the national standard NF A 09, 010 : "Controles non Destructifs-Certification des agents-Reglement general". (NDT Certification of operators-General rules) registered and issued February 1979.

In the same time, the Commission 6 established questionnaires to written general examinations before proposing recommended training course outlines for each basic method.

It's not now without work because we have many other targets to develop the French certification system!

#### **2.3.2. Commission 7: Health and Safety**

During the last years, Commission 7 used every effort to determinate and adjust practical conditions in regard to the "Certificat d'Aptitude a manipuler les appareils de radioscopie et de radiographie industrielles" (Efficiency Certificate to manipulate industrial equipment of radioscopia and radiography) mandatory by the decree promulgated on May 3, 1977. It's interesting to notice that the COFREND certificate gives equivalence with this efficiency certification under specific conditions. while continuing to resolve problems of radio-protection, the Commission 7 is in charge of determination of criteria concerning capability of distinguishing and differentiating contrast between colors used in each NDT method in collaboration with medical authority.

### **2.4 French certification scheme**

#### **2.4.1 General principles**

French system is characterized by recognition of existence of industrial sectors of which needs and organization are appropriated.

Acknowledge asked for the Certification relating to a given method in a given industrial sector depends on the one hand on a general part, valid in all industrial sectors

ors, on the other hand on a part specific of the concerned industrial sector. In consequence an operator can be certified in several industrial sectors if having passed with success general examination relative to the applicable method during a first exam in an industrial sector, he passes with success after specific examination of other industrial sectors.

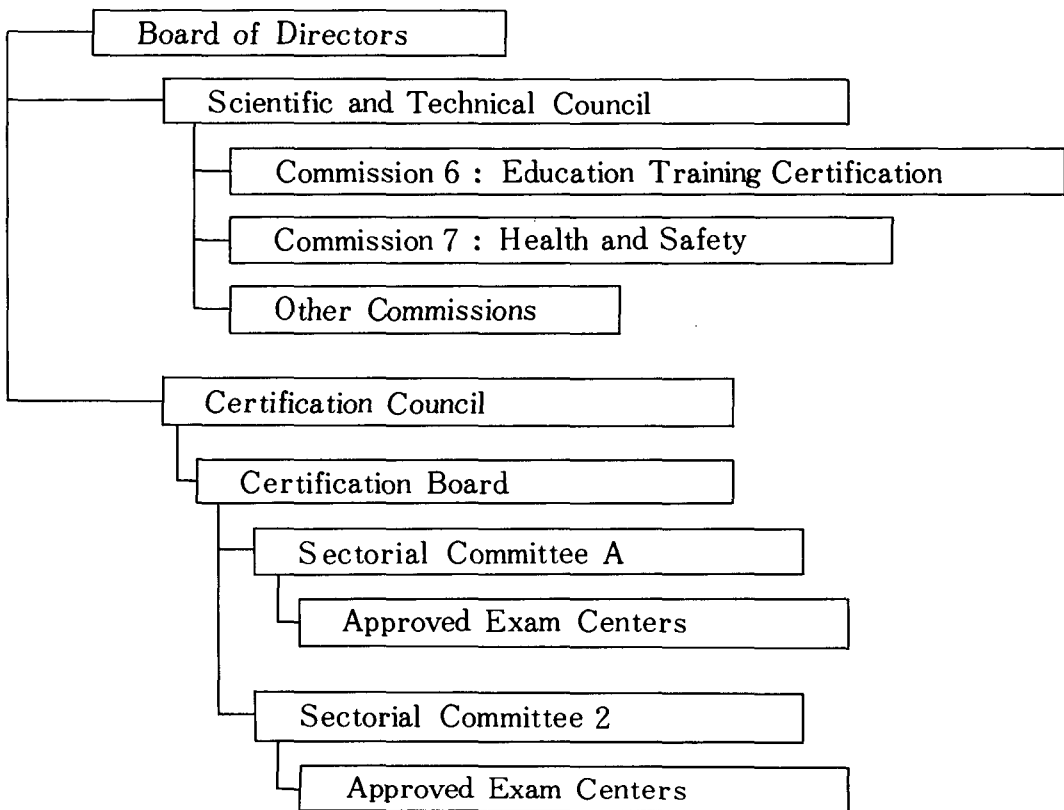
For each industrial sectors, the certification examinations are passed in approved exam centers operating under sectorial Committee, responsible to the COFREND Certification Board for all exams passed in all approved exam centers being within its competence.

The certification operations, managed by approved exam centers under control of corresponding industrial sectors, are warranted by the Certification Council through the Certification Board.

By this way, the COFREND places a mean warranted by it at disposal of employers to verify and to certify NDT operators' qualification. Responsibility of employers remains untouched upon operation permit and warranty of NDT results.

Organization chart is presented fig. 2.

Fig 2



**2. 4. 2 Certification Council- Certification Board**

The Certification Council includes

- president and Secretary of the COFREND
- Government Representative
- One representative of Commission 6
- One representative of Commission 7
- all these ones as members by right.
- One representative of each Society or Association concerned by certification among the COFREND members.

The Certification Council is responsible for

- placing in position and putting in action the COFREND certification.
- negotiating of certification equivalence with foreign NDT Societies
- warranting the certification operations managed by the Sectorial Committees through the Certification Board
- deciding creation of Sectorial Committees
- arbitrating eventual conflicts between the Certification Board and the Sectorial Committees.

The Certification Board, within its manager designated by the Certification Council and the Government Representative seating as members by right, includes, in equal numbers, members designated by the Certification Council and members delegated by Sectorial Committees at the rate one delegate one Committee.

The Certification Board must

- be careful to create Sectorial Committees and subdivide eventually these ones in function of needs.
- take note of the level 3 operators who are in charge of exams in approved exam centers appartaining to Sectorial Committees.
- coordinate the different Sectorial Committees.
- participate right in all work meeting of Sectorial Committees concerning certification operations
- act as supervisor during exam sessions at its disposal.

#### **2.4.3 Levels of qualification**

The french system has determinated three levels of qualification with same definitions than in other foreign systems, for instance in ASNT system. It's a normal way, definitions of levels being function of tasks.

#### **2.4.4 Sectorial Committees of Certification**

Until now, seven Sectorial Committees were founded, corresponding to the main branches of industry.

- steel making
- tube making
- foundry
- heavy equipment fabrication
- construction and welding
- aeronautical and aerospace

- multisectorial

But other Sectorial Committees can be founded, according to needs.

Just some words about particularities of two Committees :

- The "heavy equipment fabrication Committee is interested not only by welded assemblies, but also by basic materials such as laminated or casted materials, brides, forged products, etc.
- The "multisectorial Committee" was created for industries and organizations that have to use or test all kinds of products of all branches of industry.

The specific part of examinations must take account of these particularities.

Procedures of each sectorial Committee formed the subject of rules which must be approved by the Certification Board before operation.

Rules of each Sectorial Committee specify relations with its approved exam centers at least regarding

- approval of exam centers and supervision on their activities.
  - Keeping of files concerning the level 3 operators who are in charge of exam centers.
  - Keeping of lists of level 1 and level 2 certified after examination in exam centers.
  - Keeping register of all questionnaires to be used by exam centers.
  - Keeping list of all specimens to be used by exam centers for practical examination.
  - Centralization, and eventually verification in situ, of all informations from exam centers concerning applicants, organizations and results of examination sessions, but also questions used during these ones.
  - coordination of examination sessions between exam centers for each level and for each method, and information of these ones to the Certification Board.
- Sectorial Committees issue certificates of level 1 or level 2 operators on proposals from approved exam centers.

They organize examinations for level 3 applicants and propose their certification by the Certification Board.

#### **2.4.5 Approved exam Centers**

Approved exam centers are situated either within technical organisms or within private Societies, but in this last case they must accept at least in equal number outside and inside applicants.

These exam centers must dispose of all accommodation for personnel, building and equipment to be able to assure right passing of examination.

For each method, the approved exam Center must be in possession of one collection of specimens approved by its sectorial Committee including various and known defects and corresponding to all kinds of pieces that the applicants can have to test in the exercise of their duties. All specimens must be documented by very accurate defects records, in function of each applicable specification. All the-

se specimens must be keep out of the training of operators.

Sectorial Committees have approved the following exam centers :

- Steel making	13
- Tube making	1
- Foundry	4
- Heavy equipment fabrication	2
- Construction and welding	1
- Aeronautical and aerospace	1
- Multisectorial	1

For each Committee, the number of certified operators is not necessarily in correlation with the number of exam Centers depending also of frequencies of exam sessions.

#### 2.4.6 Level I and Level 2 Certification

##### 2.4.6.1 Candidatures

None educational references are required but it's necessary to notice that some acknowledges required for the level 2 correspond to baccalaureat level (end of high school).

All Sectorial Committees have take approximatively the same following requirements in regard to training and experience.

##### Level I

Method	UT	MT	PT	RT	ET	NT	LT			
							BT	PCLT	HDLT	MSLT
Training (hours)	40	12	4	20	12	20	2	24	12	40
Experience (months)	3	1	1	3	1	6	2 <sup>H</sup>	1, 5	1, 5	4

##### Level II

Method.	UT	MT	PT	RT	ET	NT	LT			
							BT	PCLT	HDLT	MSLT
Training (hours)	40	8	8	40	8	40	4	16	8	24
Experience as Level I (months)	9	3	2	9	9	24	0, 5	4	4	6

N-B : If an applicant want to pass directly the Level 2 examination, it's necessary to add requirements.

It's important to notice that the Commission 6 has determinated the basic mathematical and physical acknowledges not diplomas that it's necessary to



have, in the purpose to follow correctly the training course program. Without training and experience, the applicant must meet requirements concerning usual physical aptitudes in regard to each method.

#### 2.4.6.2 Examinations

As said before, examinations are passed only in approved exam centers, and managed by level 3 operators.

The examination (written and practical) includes two parts : General part and Specific part.

##### For the General part :

The written examination is using questions chosen among common questions established by Commission 6.

These questions are with choice of answers. The number of questions is usually the following :

	UT	MT	PT	RT	ET	NT	LT
Level I	40	30	30	40	30	40	15
Level II	40	30	30	40	30	40	15

In extra, the applicant must answer with success 10 radioprotection questions to obtain the equivalence of certificate of manipulating in RT.

The practical examination permits to verify if the applicant is able to manipulate correctly and adjust the equipment. The examiner grades in function of a list of at least four check points.

The applicant, if he passed with success this general examination, keeps the benefit of this one when he wants postulate to the certification in an other sectorial committee.

##### For the Specific part :

The written examination is using questions chosen among questions established by the concerned Sectorial Committee.

These questions are with choice of answer generally, sometimes with short justification.

	UT	MT	PT	RT	ET	NT	BT	PCLT	HDLT	MSLT
Level I	15	20	20	20	15	15	10	15	15	35
Level II	20	15	15	20	15	15	10	15	15	50

The practical examination, passed on more than one specimen, permits to verify the applicant is able to test correctly.

The examiner grades in function of a list of at least 6 check points.

##### Grading

A percentil weight factor to be applied to the various examinations is determined by each Sectorial Committee.

The composite grade of 80% or greater is required. Each grade for each part of the examinations shall be 70% or greater.

The Sectorial Committee is advised of the results by the examiner through the approved exam Center.

#### **2.4.6.3 Certification**

In function of the results of examinations passed in approved exam centers, these ones propose to their Sectorial Committees to issue certificates of Level 1 and Level 2 operators.

Certificates are established in the name of operators who receive personally a wallet card in so manner that they can prove their certification in situ.

On these wallet cards are indicated : level, method and Sectorial Committee. The employer must put its visa to attest the activities of its employees and to give them the authorization of operating.

##### **Validity of certification**

The length of validity of certification does not exceed three years. For renewal of the certificate, the activities of the operator during the past period of validity have to be verified and he has to pass a new physical examination. If this verification, made by the concerned sectorial Committee, does not authorize the renewal, the operator has to pass again successfully the examination (written and practical).

Furthermore, in all cases, at the end of each second period of validity, the operator has to pass successfully a new practical examination to obtain the renewal of his certificate.

#### **2.4.7 Level 3 Certification**

##### **2.4.7.1 Temporary procedure - Certification without examination**

To initiate the COFREND certification system, during one year, it was possible to postulate to certification without examination, in each sectorial Committee provided that this one was founded before 79 June 30.

Without the results of classical physical examination, file of each applicant was examined by the concerned Sectorial Committee, for a given method, on the basis of the two following criteria.

- Educational references
- NDT Experience.

NDT experience requirements were (N-n) years where N was fifteen years for Multisectorial Committee and ten years for all others Committees.

Bonus n was depending of educational references :

Engineer Diploma-Degree of Doctor	n= 6 years
Licence-Maitrise-Dest	n= 5 years
DUT-BTS	n= 4 years

Cycle complet CNAM n= 3 years  
 Baccalaureat Scientifique et Technique n= 2 years.  
 Technique

Plus in extra

Supplementary Engineer Diploma n= 1 year  
 Teaching activities or publication of  
 technical papers in NDT n= 1 year

Each file, including all proves, was examined, in a first time by the concerned Sectorial Committee, and after by the Certification Board. It's important to say that a big lot of files was definitely rejected.

Number of level 3 certified without examination was the following :

Steel making	57 operators
Tube making	26 operators
Foundry	23 operators
Construction and welding	95 operators
Heavy Equipment fabrication	82 operators
Aeronautical and aerospace	87 operators
Multisectorial	<u>102 operators</u>
Total	472 operators.

#### 2.4.7.2 Normal procedure-Certification with examination

##### Requirements

Without the results of classical physical examination, a candidate shall satisfy the following criteria concerning NDT experience to be considered for passing examination.

	Diploma	Required experience years
From Level 2 to Level 3 (experience as Level 2 )	DUT or BTS min	2
	Nothing	4
Directly to Level 3	Engineer Diploma Degree of Doctor Licence - Maitrise DEST	2
	Nothing (Temporarily)	6

## Examinations

Examinations are directly organized and conducted by the concerned Sectorial Committee.

These examinations cover :

- general acknowledge relative to the applicable method, but also relative to the certification system.
- specific acknowledge relative to the use of the applicable method in the sector of activities including acknowledge of usefull code and standards.

Specific acknowledge are verified not only by answering to written questions, but also by establishing a specification on the request of the Sectorial Committee.

- general acknowledge level 2 relative to two other methods in use by the Sectorial Committee.

A percentil weight factor to be applied to the various examination is determined by each Sectorial Committee.

The composite grade of 90% or greater is required. Each grade for each part of the examination shall be 80% or greater.

### **2. 4. 7. 3 Certification**

Certificates are issued by the Certification Board on proposal of Sectorial Committees.

### **2. 4. 7. 4 Validity of Certificate**

The lenght of validity of certification does not exceed three years.

For renewal of the certificate, the Level 3 has to prove that he has worked with satisfaction and without interruption exceeding one year, in one or several times.

If renewal is not obtained, it's necessary to pass exams, according to normal procedure.

But now COFREND is working to modify eventually the procedure relative to the renewal.

### 3 . COMPARISON BETWEEN SEVERAL USEFUL CERTIFICATION SCHEMES

#### 3.1 Foreword

At present, the purpose is not to judge several certification schemes but only to compare them in showing up differences.

The four following certification schemes shall be examined.

- American scheme according to SNT-TC-1A June 75
- English scheme CSWIP (Certification Scheme for Weldment Inspection Personnel)
- French scheme according to standard NF·A·09·010- COFREND
- Scandinavian scheme Nordtest formerly UNICERT

German scheme cannot be examined, being presently in evolution.

Spanish, Italian or Austrian schemes are not enough advanced.

#### 3.2 Levels of qualification

ASNT	All methods	Level 1, 2, 3
CSWIP	RT	Level 1, 2, 3
	UT welds	Level 2
	steel products	Level 2
	MT and PT	Level 2
COFREND	All methods	Level 1, 2, 3
Nordtest	All methods	Level 2

#### Comments

- The CSWIP scheme does not make explicit use of the three qualification levels. In radiography, however it's possible to find three levels. In MT, PT or UT examinations seem correspond to level 2. It's important to notice that certification can be limited to cover only certain materials, or welding methods !
- The Nordtest is presently focused on level 2 but an extension of the scheme to include level 3, is now being considered.
- The other european schemes (Spanish, Italian, ...) generally have adopted three levels.

### 3.3 Utilization Field of Certification

For each level, listed before, the utilization field of certification is as follows :

ASNT	Large	For each method, all activities of the employer
CSWIP	Very small	RT 8 different certificates for each class (RT and high energy RT) 4 certificates depending on material group  UT welds 17 different certificates depending on categories of joint  UT plate 4 different certificates  PT 1 certificate  MT 1 certificate
COFREND	Very large	for each method, all activities concerned of industrial sector
Nordtest	Small	RT 6 different certificates depending on materials and products  UT 6 different certificates : 4 for welds 1 for forged products, 1 for casts  PT 1 certificate  MT 1 certificate

Comments : It's necessary to notice that the Nordtest system includes UT on non metallic materials and on aircraft products.

### 3.4 Issuance of certificate

#### 3.4.1 Level 1 and Level 2

ASNT	To the operator by the employer No valid for an other employment
CSWIP	To the operator by the CSWIP exam center Copy to the employer  Valid for all employments.
COFREND	To the operator by the Sectorial Committee, under supervision of the Certification Board on request copy of exam file to the employer valid for all employments. inside the same industrial sector

NORDTEST	To the operator only after one year's work by the exam Center under supervision of Board of Directors Valid for all employments.
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COMMENTS: Except for ASNT scheme, certificates are issued by independent authorities and are owned by the operators. It's the general tendency in Europe.

### 3.4.2 Level 3

ASNT	To the operator - by the employer if certification issued by this one - by ASNT if certification issued by this one Eventually valid for all employments if agreed by the new employer.
CSWIP	To the operator by the CSWIP exam Center (RT only) valid for all employments.
COFREND	To the operator by the Certification Board valid for all employments inside the same industrial sector

COMMENTS: It's interesting to notice that certificate issued by ASNT is sent to the private address of the operator.  
The general tendency is now that the certificate, fully owned by the operator, is issued by independent authority.

### 3.5 Validity and Renewal

#### 3.5.1 Level 1 and Level 2

ASNT	for each method validity 3 years max renewal at least once every 3 years, in accordance with one of the following criteria :  -evidence of continuing satisfactory performance - re-exam.
CSWIP	for UT·MT·PT validity 1 year renewal once every year in accordance with evidence of continuing satisfactory performance attested by the employer. re-exam after 5 years.

	for RT· validity 5 years renewal once every year in accordance with evidence of continuing satisfactory performance attested by the employer.
COFREND	for each method. validity 3 years renewal once every 3 years in accordance with evidence of continuing satisfactory performance attested by the employer. practical re-exam after 6 years
Nordtest	for each method validity 1 year renewal once every year in accordance with evidence of continuing satisfactory performance attested by the employer re-exam after 5 years.

### 3. 5. 2 Level 3

ASNT	<p>If the certificate is issued by the employer, validity of the certification is 3 years max.</p> <p>The level 3 operator should be re-certified at least once every three years in accordance with one of the following criteria.</p> <ul style="list-style-type: none"> <li>- Evidence of continuing satisfactory performance</li> <li>- re-exam.</li> </ul> <p>These informations are in accordance with SNT-TC-1A 75. But it's possible to suppose that these recommendations are modified by the new issue of SNT-TC-1A published in June 80.</p> <p>If the certificate is issued by ASNT with exam or without exam (grandfathering system ) validity is now 5 years.</p> <p>After 5 years, the level 3 operator should re-certified, in accordance with a very accurate procedure. It's necessary to prove not only evidence of continuing satisfactory performance but also progression into NDT.</p>
COFREND	<p>Validity is 3 years</p> <p>Renewal can be obtained with the evidence of continuing satisfactory performance.</p> <p>But probably this rule shall be modified in the next future.</p>



CSWIP	For RT only, same rules than to level 1 and level 2.
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It's too soon to estimate the general tendency in Europe, but several projects require level 3 certification issued by independent authority, even if level 2 or level 3 certification is not issued by this authority.

### 3.6 Uniformity of judgment

ASNT	Cannot be evaluated written practices established by each employer
CSWIP	Excellent-Centralized system
COFREND	Good Uniformity of exams for all approved center exam inside a Sectorial Committee  Harmonizing by the Certification Board between Sectorial Committees.
NORDTEST	Good all center exams supervised by Board of Directors.

It's sure that it's impossible to warrant uniformity of judgment without centralized systems. But according to our opinion, it's not necessary to have nationalized systems.

Well coordinated liberal systems as COFREND or Nordtest are sufficient.

It's correct to notice that this uniformity of judgment exists also when ASNT conducts level 3 exam.

### 3.7 Independence

It's also sure that centralized systems as CSWIP, COFREND or Nordtest are fully independent.

For all European certification systems, in operation or in project, certification shall be issued

- either by authority independent of employer
- or by mixed system: qualification recognized by independent authority prior certification by the employer

No system relies fully on the employer.

### 3.8 Conditions of examinations

Generally, whichever certification systems may be, conditions of examina-

tions are very similar : general exam to verify the acknowledge of basic test principles relative to the applicable method, specific exam to verify the acknowledge of equipment, codes, etc. practical examination to demonstrate proficieny in testing, questionnaire with multichoice answers, check points, etc.

We must notice that some systems, as CSWIP or Nordtest, attach great importance to practical examinations.

### 3.9 Training

Just as experience can be related to the reliability of the practical examination, training can be related to the reliability of the theoretical examination.

If Training is a safety measure against incomplete assesement of the candidate's knowledge during the examination, unfortunately there is no guarantee that a person does profit of a course.

Useful required length of training (hours) are as follows:

Method	RT	RT	UT	UT	MT	MT	PT	PT
Level 1	1	2	1	2	1	2	1	2
ASNT*	12	40	24	40	8	4	4	4
**	20	40	40	40	12	8	4	8
***	80	100	40	80	24	16	12	16
CSWIP	No requirements							
COFREND	20	40	40	40	12	8	4	8
Nordtest	60		80		20		12	

\* : 2 years college    \*\* : highschool    \*\*\* : Grammar school.

#### COMMENTS:

Since ability to profit of a course can be expected to have some relation to the educational background, it's reasonable to differentiate the required length of training according to the educational background. It's the american position though we can be doubtful about the ability of a person, having obtained only grammar school diploma, 20 years before, to acquire the same knowledges than an highschool graduate with only more several training hours. It's reason why COFREND determinates the basic knowledges in mathematics and physics, that it's necessary to have to be able to profit of a training course.

### 3.10 Experience

Requirements concerning experience become more important when the sc-

heme does not secure a practical exam with wide enough coverage.

Useful required length of training (months) are as follows:

Method	RT	RT	UT	UT	MT	MT	PT	PT
Level 1	1	2	1	2	1	2	1	2
ASNT	3	9	3	9	1	3	1	2
CSWIP	6	6		6		6		6
COFREND	3	9	3	9	1	3	1	2
Nordtest		12		12		5		5

### 3. 11 Health

Generally, except CSWIP, certification schemes require an examination to assure:

- natural or corrected near distance acuity in at least one eye
- distinction and dirrerentiation of contrast between colors used in the applicable method.

## 4 . LOOK TO FUTURE

Certification is now a world problem. Each country has established or is establishing its national system to take into account their specificities: educational system, regulations, etc.

Certification formed the subject of a round table and of papers in the 8th World Conference in NDT, on Cannes in 1976, of an other round table in the European NDT Conference on Mainz in 1977, of a special session and a hot round table in the 9th World Conference in NDT on Melbourne in 1979.

If it's evident that it's impossible to have an universal certification system, it's necessary, with a world consensus of qualification level, reciprocal recognition of certification system between national NDT Committee. In other case, with the multiplication of certification systems, we shall have to buy and bring a suit case to preserve wallet cards of certification that we shall have to pass !

During the last european meeting of presidents NDT Committees in Göttingen on May 80, different systems were examined.

Because it's appeared that the different systems in operation or in very advanced project in Austria, Belgium, France, Germany, Italy, Norway, Spain, Sveridge, Switzerland were very similar, all presidents have foreseen the possibility of bilateral recognition round about 1982.