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New Requirements Regarding the Certification of Coordination and Inspection Personnel in the Field of Welding. Personnel Certification Systems Existing at European/International Level. Implementation in Romania

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Abstract

In order to have competent personnel the manufacturers need to have personnel having a proved competence. This becomes more and more a contractual requirement. The requirements referring to the personnel competence are higher and higher.

The certification schemes realized by the European Welding Federation (EWF), through EN 473 / ISO 9712 provide a way through which the capability can be evaluated and recognized. The paper presents in a comparative way the requirements of the standards, with other certification schemes, being realized parallels with the way the activity is realized in Romania respectively referring to the new requirements that will have to be implemented in Romania. The experience of the countries who implement the EWF system will be also presented.

Key words*: qualification of personnel, certification, welding, non-destructive examination*

Introduction

Welding or Inspection procedures are not simply execution or measurement techniques (i.e., a combination of physical principles, measuring methods and equipment). They consist of a more complex process involving many elements such as: equipment settings, calibration and functional examinations, examination work details, recording and illustration tools, software, and personnel (e.g., interpretation of indications relying on the skill of the operator).

The analysis of a welding or an inspection procedure's effectiveness is particularly important step that has to be realized.

The reliability of these welding/inspection procedures is related to several factors, which should be defined correctly in view of their application for structural integrity assessment. A specific importance should be given to:
- Geometry, accessibility and material properties of the component under study;
- Type of present imperfections;
- Selection of the specific welding/NDE method employed;

- Optimization of the procedure to the specific situation (component material, geometry and imperfections);
- Qualifications/certificates hold by the welding/NDE personnel (human factor).

Actual Stage in the World and in Romania

At this moment the most accepted, worldwide system for qualification of welding personnel is the IIW/EWF system, while for the NDE system the certification according to the EN 473 requirements is the most accepted one in Europe.

Starting 2001 the IIW/EWF system has developed nearby of the qualification system also a certification system. The certification refers to Welding Structure Manufacturers and to personnel certification. The present work will focus on the:

The IIW/EWF certification system for personnel qualification/certification is described in fig. 1.

ACTIVITY	RESPONSIBILITY
ISO 3834 CERTIFICATION OF COMPANY (Includes assessing Welding Coordinators to ISO 14731)	IIW ISO 3834 Manufacturers Certification Scheme
	↑ Supports
ISSUE AUTHORITY TO WORK (Possibly in accordance with ISO 14731 for welding co-ordinators)	EMPLOYER
	↑ Supports
DEMONSTRATE A WELDING COORDINATOR'S CURRENT COMPETENCE	IIW CERTIFICATE Accredited to ISO/IEC 17024
	↑ Supports
DEMONSTRATE A WELDING COORDINATOR'S KNOWLEDGE (HISTORICAL)	IIW DIPLOMA NOT Accredited to ISO/IEC 17024

Fig. 1. The route to achieve certification and the route for the other levels are similar.

The system is already functioning in Italy, Czech Republic, Poland, Slovakia and United Kingdom. Figure 2 shows the cumulative IIW/EWF welding personnel certificates issued until 2008.

Since 2009 ASR CertPers started the personnel certification process according to the EWF certification of welding personnel scheme.

This certification scheme offers an easy way through which the capability of welding coordination personnel by an independent body may be evaluated and recognized.

The certification scheme developed by ASR CertPers requests following steps, presented in Figure 3.

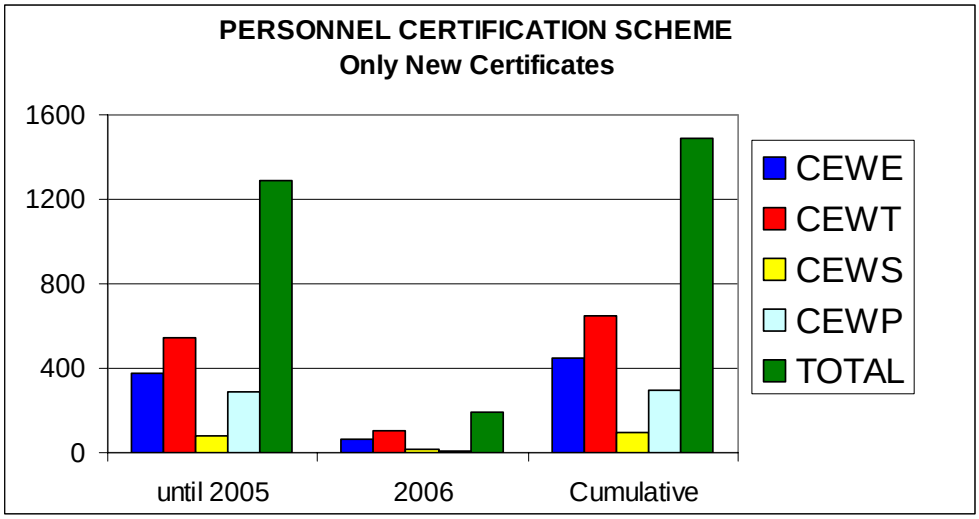

Fig. 2. Cumulative IIW/EWF welding personnel certificates issued until 2008

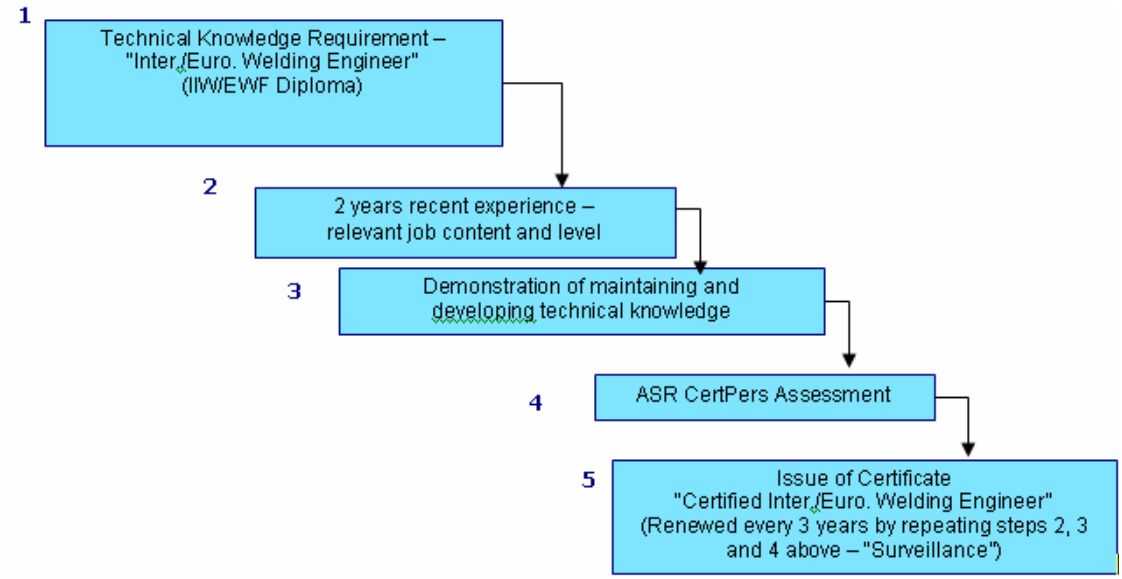

Fig. 3. Certification scheme steps

The personnel certification suposes the transmital to ASR CertPers of an application formular, which will be assessed by ASR CertPers.

The place and date of the assessment are established by the Chief Executive of ASR-CertPers S.R.L. after agreement with the Certification Board and are comunicated to the candidates minimum two weeks before assessment. The ASR-CertPers Governing Board is establishing the Certification Board. The Certification Board consists of relevant experts from industrial and educational fields.

The time devoted to the assessment is of at least 1 hour/candidate.

The requirements requested by the application form refer to:
- personal data (EWF diploma, no. of diploma etc.);
- endorsement by the employer;

- nomination of a referee for further information;
- level of certification sought;
- record of professional activities as author, teacher or examiner;
- participation in the work of other bodies;
- maintaining and developing knowledge (with data of the last 3 years activities);
- record of recent professional welding experience (for the main activities specified in the job function, including his position in the organigram);
- previous career record.

Notes to applicants:

i. Certified persons are required to abide by the Rules of Professional Conduct. Failure to do so may result in withdrawal of the certificat*e*.
ii. Certification requires renewal every three years. On each occasion the certified person must complete a Renewal Application Form and pay the renewal fee.
iii. Lists of certificate holders are made available to the public by ASR CertPers

The scheme developed by ASR CertPers helps the Welded Steel Structures Manufacturers through the possibility of welding personnel certification according to the EWF scheme. In the first month from starting of this activity 3 applications where received and 3 persons where certified.

If in the field of inspection a wide range of personnel certification documents also exist. In the next table details related to the list of standards and/or documents related with qualification and certification of Welding Inspectors are given.

Table 1. List of standards and/or documents related with qualification and certification of Welding Inspectors

Standard or document ref.	Title	Remarks
W178.2 – 1982	Certification of Welding Inspectors	Canadian National Standard
CSWIP-WI-6-92	Requirements for the Certification of Visual Welding Inspectors, Welding Inspectors and Senior Welding Inspectors (fusion welding)	United Kingdom (TWI) document
AWS QC1: 96	Standard for AWS Certification of Welding Inspectors	American National Standard
WTIA/CBIP July 1999	Procedure for Qualification and Certification of Welding Fabrication Inspection Personnel	Australian (WTIA) and New Zealand (CBIP) document
XP A 88-120 July 2000	Certification of Welding Inspectors – General Rules	French experimental National Standard
UNE 14618 July 2000	Welding Inspectors. Qualification and Certification	Spanish National Standard

Table 2 indicates, in a comparative way, if the documents describe the competency requirements for the different Inspector levels considered.

Table 3 indicates the period of validity of the certificate issued for the different Inspector levels analyzed.

Regarding NDT we have as referential in Europe two main standards EN 473 and ISO 9712.

Since the approach of both standards is similar, but less known, in the next rows we would like to discuss them.

Table 2. Competency requirements for the different Inspector levels

Standard or document ref.	Competency requirements	Remarks
W178.2 – 1982	Described for the three levels considered	Canadian National Standard
CSWIP-WI-6-92	Described for the three levels considered	United Kingdom (TWI) document
AWS QC1: 96	Described for the three levels considered	American National Standard
WTIA/CBIP July 1999	Described for the two levels considered	Australian (WTIA) and New Zealand (CBIP) document
XP A 88-120 July 2000	Described for the three levels	French experimental National Standard
UNE 14618 July 2000	Described for the three levels considered	Spanish National Standard

Table 3. Period of issued certificate validity for different Inspector levels

Standard or document ref.	Validity of certificate	Remarks
W178.2 – 1982	Two years	Canadian National Standard
CSWIP-WI-6-92	Five years	United Kingdom (TWI) document
AWS QC1: 96	Three years	American National Standard
IIW-XIV-670-97	Not included, this document deals only with qualification aspects	Draft of proposed Standard
XP A 88-120 July 2000	Five years	French experimental National Standard
UNE 14618 July 2000	Three years	Spanish National Standard

The NDT personnel certification has 3 levels:

Level 1

An individual certificated to level 1 has demonstrated competence to carry out NDT according to written instructions and under the supervision of level 2 or level 3 personnel. Within the scope of the competence defined on the certificate, level 1 personnel may be authorized by the employer to:

a) setup NDT equipment;
b) perform the tests;
c) record and classify the results of the tests in terms of written criteria;
d) report the results.

Level 1 certificated personnel shall not be responsible for the choice of test method or technique to be used, nor for the assessment of test results.

Level 2

An individual certificated to level 2 has demonstrated competence to perform non-destructive testing according to established or recognized procedures. Within the scope of the competence defined on the certificate, level 2 personnel may be authorized by the employer to:

a) select the NDT technique for the testing method to be used;
b) define the limitations of application of the testing method;
c) translate NDT standards and specifications into NDT instructions;
d) set up and verify equipment settings;
e) perform and supervise tests;
f) interpret and evaluate results according to applicable standards, codes or specifications;

g) prepare written NDT instructions;
h) carry out and supervise all tasks at level 1;
i) provide guidance for personnel at or below level 2;
j) organize and report the results of non-destructive tests.

Level 3

An individual certificated to level 3 has demonstrated competence to perform and direct non-destructive testing operations for which he is certificated. Within the scope of the competence defined on certificate, level 3 personnel may be authorized to:

a) assume full responsibility for a test facility or examination centre and staff;
b) establish and validate NDT instructions and procedures;
c) interpret standards, codes, specifications and procedures;
d) designate the particular test methods, procedures and NDT instructions to be used
e) carry out and supervise all level 1 and level 2 duties,
f) provide guidance for NDT personnel at all levels

Same tasks are requested by both standards.

Unlike EN 473, ISO 9712 has no requirements for level 3 basic knowledge (direct access to level 3). The next table gives details related to the minimum NDT training hours required according to EN 473 respectively ISO 9712. As we can observe they are certain differences in the number of training hours.

Table 4. Minimum NDT training requirements

Minimum training requirements / Method	**Level 1 (h)**		**Level 2 (h)**		**Level 3 (h)**	
	EN473	**ISO 9712**	**EN473**	**ISO 9712**	**EN473**	**ISO 9712**
VT	16	16	24	40	24	64
MT	16	16	24	40	32	60
PT	16	16	24	40	24	60
RT	72	40	80	120	72	160
UT	64	40	80	120	72	160

EN 473 allows the certification body to require a minimum period of experience prior to examination (a fraction of X% of the total requirement as appropriate). ISO 9712 permitted 0% experience before examination.

Unlike ISO 9712, EN 473 specifies the conditions for revalidation in the case of invalidation of the certification. For revalidation after a significant interruption the individual shall pass a recertification examination.

Unlike ISO 9712, EN 473 specifies that failure in the recertification examination shall result in the individual being considered as initial candidate for certification in the sector, method and level concerned.

EN 473 specifies also that the renewal files presented up to 12 months after the expiration date may be considered by the certification body but after these twelve months the candidate shall recertify.

Recertification

Level 1 and level 2

Unlike ISO 9712, EN 473 allows only one retest of the recertification examination. In this case no examination exemptions shall be awarded by virtue of any other valid certification held.

Unlike ISO 9712, EN 473 allows the recertification in the light of the demonstration during an audit of continued competence on the work performed.

Level 3

ISO 9712 requires the demonstration of continued practical competence at level 2 EN 473 does not insofar as one of the most important parameter included in the structured credit system for level 3 recertification concerns the industrial activity. On the other hand, in EN 473 level 3 certificate holders seeking recertification shall complete a written examination which includes questions on the application of the test method in the sector concerned (at least 4 of which shall require narrative answers which demonstrate an understanding of current NDT techniques, standards, codes or specifications and applied techniques.
Unlike ISO 9712, EN 473 allows only one retest of the recertification examination.

Conclusion

As we could see the next step from qualification means certification of personnel. If in the field of welding al levels, from engineer to welder are subject to a harmonized certification, in the field of NDT the situation is not yet harmonized but has the same direction at all levels.
Starting the certification process in Romania was a necessary step in order to have the same approach as in Europe.

Noi cerințe referitoare la certificarea personalului de coordonare şi de inspecție in domeniul sudării. Sisteme de certificare a personalului existent la nivel european/internațional. Implementare în România

Rezumat

Personalul competent angajat de fabricanți trebuie să facă dovada competenței sale. Aceasta condiție devine tot mai mult o cerință contractuală. Cerințele referitoare la competența personalului devin tot mai ridicate.

Schemele de certificare realizate de Federația Europeană de Sudare (EWF), respectiv prin EN 473/ ISO 9712 furnizează un mijloc prin care poate fi evaluată şi recunoscută această capabilitate. Lucrarea prezintă cerințele standardelor în mod comparativ cu alte scheme de certificare, fiind realizate paralele cu modul în care este dezvoltată activitatea în România, respectiv referitor la noile cerințe care urmează a fi preluate şi implementate în România. Va fi de asemenea prezentată experiența țărilor care implementează sistemul EWF.