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## ECVET-Analysis – Main-Cert

According to the targets described in the application, the ECVET Analysis is carried out using the stages recommended in the project.

This project recommends the implementation in the following steps which can be grouped in two phases:

Phase 1: Stipulation of learning times and credit points

1. Description and definition of professional competences according to definition of certificate
2. Determination of required learning periods for the competence components acquired by informal learning, on the basis of the curricula of a qualification leading to the certification
3. Determination of required times of practical work to master the expected tasks
4. Calculation to change practical times into the equivalent in learning periods
5. Determination of the overall periods by summarizing the respective single competences
6. Analysis and positioning on the basis of EQF and NQF
7. Comparing assessments after 5 and 6 and determination of the credits for the overall qualification which is the certificate
8. Splitting the qualification into UNITS and assignment of the credit points according to ECVET

Phase 2: Determination of competences and recognition

9. If required, proof of practical experience
10. Passing a procedure for the recognition of the competences
11. Recognition of the credit points

This method allows granting credit points to a person independent of the way they were acquired.

### 1. Description and definition of professional competences according to definition of certificate

The required professional competences in Maintenance were structured in 11 learning outcomes and described in detail (WP 3 point 2). This was based on a structure comprising competences, abilities and expert knowledge. They then formed learning units describe the competences required for working as a supervisor in maintenance, independent of the way they were acquired. However, maintenance is characterized by non-formal learning in the job and by informal learning. For the certification of these competences, sufficient professional experience is required. The Main-Cert Certification Order (point 8) demands proof of a minimum of three years practical experience in which the practical professional experience must be gained in the following fields of competences:

- Determination of the maintenance demand
- Organisational structure of a maintenance unit
- Planning and handling of orders
- Management of external contractors
- Management of materials and spare parts
- Documents and information management
- Maintenance controlling
- Maintenance support by DP systems
- Technical diagnostics
- Maintenance and added value
- Safety, health and environmental protection

The required period of three years of practical work represents the share of non-formal and informal learning.

## **2. Determination of the required learning periods for the competence components which could be gained by formal learning on the basis of the curricula of a qualification which could prepare for the certification**

For the field of maintenance, there is no special professional training or studies available. Additionally, a supervisor on a junior management level is expected to have management competences which are normally acquired by rather informal or non-formal learning. Therefore, the share of formal learning is relatively small. With the product 10, a preparatory certification course has been developed. This course is meant to complement the competences gained by non-formal or informal learning also theoretically. The course with just 52 hours comprises a rather small share of the learning activities, however, it offers a good approach for considering the relative importance of the described competences required for working in that profession.

In the learning period of 52 lessons, the following topics are dealt with (number of lessons):

- |              |   |      |
|--------------|---|------|
| • Module 1:  | Determination of the maintenance demand                       | (11) |
| • Module 2:  | Organizational structure                                      | (4)  |
| • Module 3:  | Handling of orders  | (5)  |
| • Module 4:  | Management of external contractors                            | (3)  |
| • Module 5:  | Management of material and spare parts                        | (4)  |
| • Module 6:  | Documents / information management                            | (5)  |
| • Module 7:  | Maintenance Controlling                                       | (3)  |
| • Module 8:  | Maintenance support by DP systems                             | (3)  |
| • Module 9:  | Technical Diagnostics   | (3)  |
| • Module 10: | Maintenance and added value                                   | (3)  |
| • Module 11: | Safety, health and environmental protection<br>in maintenance | (8)  |

## **3. Determination of the required period of practical work to master the expected tasks**

The required period of practical work in the certification order has been fixed at three years. This period was fixed using empirical methods; it is based on information from interviews with maintenance experts and persons in charge of maintenance in several enterprises in maintenance industry.

#### **4. Calculation for changing practical times into the equivalent for learning time**

Periods of practical work are not exclusively learning periods. The concept of the learning curve and the experience curve indicates that in the beginning a learner learns very much. Then the share of learning is declining until a so-called plateau is reached. This exponential curve can only be estimated. However, university teaching in the field of ECTS can be applied as an orientation; there practical periods are considered by half of these periods, i.e. 50% are regarded to be learning periods. Consequently, for a normal working year of about 1600 hours and a required time of practical work, the learning equivalent would be 2400 hours.

#### **5. Determination of the overall times by summarizing the respective single competences**

By summarizing the learning times from points 4 and 5, the so-called “notional learning time” is fixed. The concept of “notional learning time” is applied at English Anglo-American universities and includes all ways of learning.

The concept of „notional learning time“ is meant to measure the efforts taken by a learner in the learning process for reaching the required learning targets. It is defined as the average time a learner would need in formal education for reaching the learning targets.

“Notional Learning Time” is an average value which, however, does not only comprise the training periods with a teacher but also preparatory times, periods of self-studies and the whole examination process. Therefore, it is also a measure for blended learning.

Since the preparatory course is rather a recommended than a compulsory learning period, the overall calculation leads to a time equivalent of about 2450 hours.

#### **6. Analysis and positioning on the basis of EQF and NQF**

After calculating the learning equivalent empirically and finally stipulating the credits, now the position of the Main-Cert-Certificate according to EQF/DQF is to be fixed.

The Main-Cert-Certificate certifies acquired competences to specialists and managers in the maintenance industry. It is targeted at junior managers at the lowest level of leadership, mainly skilled workers or experts also in charge of personnel management. According to this definition and the fact that those leaders have at least passed a professional training but not necessarily studied, the stages 5 and 6 should be included in the analysis. The basis for this analysis should be the DQR which adds social competences to the competences in the special expert fields. This addition is essential for the target group and the definition of the certificate.

Level 5 requires competences for own independent planning and work at comprehensive tasks in a complex, specialized and changing field of learning or of professional activities. Here only simple leadership abilities are required, therefore this level is not appropriate. According to Main-Cert, this would be the self-organizing maintenance specialist who has very few or hardly any leading functions. This group of persons, however, is not the target group of the Main-Cert certificate. The test phase, which included also these persons, clearly showed that those skilled workers are not able to successfully pass that certification procedure.

Level 6 is more appropriate. Persons at that level have competences for independent planning, handling and assessment of complex tasks and problems as well as for independent control of

processes in the field of a scientific subject or in a professional environment. The structure of requirements is characterized by complexity and frequent changes.

Social competence has the following requirements:

- Responsibility in working in expert teams or in leading groups or organizations
- Leading the development of expert competences of others and handling problems in a team with foresight
- Providing arguments about complex problems and solutions regarding the special field towards experts and developing them further together with the experts

This level is considered to be the right one for the position of the Main-Cert certification holders, which has also been supported by the ranking and definition of qualifications in the meantime. This level was assigned to the following qualifications / professions:

- Bachelor
- Master
- Operativer Professional (IT)

The test phase confirms this arrangement.

#### **7. Comparing assessment after 5 and 6 and stipulation of the credits for the overall qualification, the certificate**

According to the stipulated learning time in point 5 and the assessment in point 6, the holder of a Main-Cert Certificate can be expected to have the proven learning performance. Consequently, he has reached an average “notional learning time” of 2500 hours in DQF/EQF level 6. Therefore the holder of that certificate has professional competences which would correspond to the qualification of a German “Meister” even when he does not have a formal qualification or an even higher qualification.

The calculation on the basis of the Recommendation of the European Parliament and the European Council of 18th June 2009 for the establishment of a European credit point system for professional training would result in 90 ECVET points. Nevertheless, since the matter of credits is being discussed rather controversially at present, the Main-Cert Certificate is now analysed on the basis of the “notional learning time”. One has to note that this “notional learning time” and the assigned points never stand alone; they always have to be used in the context of the respective description of acquired learning credits.

## 8. Splitting the qualification into UNITS and assigning the credit points according to ECVET

The ECVET Recommendation assumes that the overall value of a point for a qualification is fixed first, and only then it is split up for the single learning units. Starting from this and using the fixed total value of notional learning time (NLT) of 2400 hours as well as the importance or the share of single competences as described in point 2, these competences get the following learning times and ECVET points:

No	Competence	share in %	NLT	Points
1	Stipulation of demand in maintenances	21	529	19
2	Organizational structure	8	192	7
3	Handling of orders	10	240	9
4	Management of external contractors	6	144	5
5	Management of material and spare parts	8	192	7
6	Documents / information management	10	240	9
7	Maintenance Controlling	6	144	5
8	Maintenance support by DP systems	6	144	5
9	Technical diagnostics	6	144	5
10	Maintenance and added value	6	144	5
11	Safety, health and environment protection	15	385	14
	Main-Cert Certificate		2500	90

### Phase 2: Determination and recognition of competences – Steps 9 to 11

The certification process is concluded by an examination procedure at an accredited Main-Cert Examination centre. By passing the three-step examination, the candidate proves to have the professional competences as stated in the competence descriptions of the certificate.

So the holder of the Main-Cert Certificate can prove that he has acquired the respective learning credits. The certificate certifies competences independent of the way they were acquired. Thus, formal, non-formal and informal learning are summarized in one certificate and in a joint recognition of professional knowledge.

The procedure for stipulating the competences and the certification itself is fixed in the Main-Cert certification order (point 8). This Certification order is applicable to all countries. Adhering to this order guarantees that the holder of the Main-Cert Certificate really has the confirmed professional competences.