

# New Education Courses of DGZfP

## (1) NDT Technologist and (2) Materials Tester

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**Abstract.** On demand of the corporate members of the DGZfP and F-GZP the German Society for NDT has set up a training network between the society and its training organisation DGZfP Ausbildung und Training GmbH, Siemens AG in Berlin and several German NDT service providers.

Goal of this training network is the creation of vocational education in the field of materials testing of high quality and broad competence. As a result of this project two new vocational training concept in the area of NDT have been created: the NDT Technologist and the Materials Tester with focus on NDT.

### Introduction

In 2004, German NDT service companies discussed with DGZfP and F-GZP (which is the “Technical Society of accredited NDT service providers” within DGZfP) the urgent need to take actions because of missing well training and competent young NDT personnel.

DGZfP and F-GZP started to establish a training network between different partners which are:

- Different German NDT service providers
- Werner-von-Siemens Berufsschule (vocational school)
- Siemens Professional Education AG
- Siemens Technik Akademie
- DGZfP e.V
- DGZfP Ausbildung und Training GmbH

The result of this cooperation is the creation of two new vocational training courses with state-approved examination in the field of NDT.

### 1. NDT Technologist

#### 1.1 Training network

The training course of the NDT Technologist is divided into 4 semesters, each of six months. The first three semesters will take place at Siemens Technik Akademie and DGZfP in Berlin. The last semester includes the performance of a practical semester work which is to be realised at the respective NDT company which covers the cost for the course, and is the main part of the final examination.

## NDT Technologist

- ⇒ Main focus on NDT level 3
- ⇒ in 6 NDT methods (ET, MT, PT, RT, UT, VT)
- ⇒ including DGZfP NDT Master qualification
  
- ⇒ 4 semesters
  
- ⇒ State-approved examination

The training is a modular combination of engineer-like theoretical and practical studies and NDT training sessions according to the requirements of the European standards EN 473 and the DGZfP NDT Master certificate.

### 1.2 DGZfP select and DGZfP NDT Master Certificate

A few years ago, DGZfP has redrafted its basic training course for level 3 and established the so-called **NDT select** training and the **NDT Master** certificate, both are protected trade marks.

The idea was that for level 3 personnel who will focus afterwards mainly on one specific NDT method, e.g. ultrasonic testing, the broad knowledge of the former NDT basic course is not necessary.

On the contrary in such cases the quick achievement of the level 3 in the specific NDT method is of more importance than broad and comprehensive knowledge. So, two different models of level 3 basic knowledge were developed:

- a 2-weekly course (Module 1) focussing on materials, main NDT methods (RT, UT, MT, PT, VT and ET) and EN 473 requirements, and
- a comprehensive 4-weekly training.

The latter includes the 2-weekly standard basic course and additionally two more modules:

- a 1-weekly course (Module 2) dealing with selection of NDT methods, comparisons of NDT methods and case studies, and
- a 1-weekly course (Module 3) covering more NDT methods such as LT, AT, VA and IT, the ASNT recommendation “SNT-TC-1A, Personnel Qualification and Certification in NDT” as well as accreditation principles and procedures.

This comprehensive 4-weekly training is called “DGZfP select”. At the end of each module an examination takes place.

NDT personnel who has successfully completed the NDT select course and additionally has passed the level 3 examination of two NDT methods whereas one of them must be a volume method (radiographic or ultrasonic testing), are allowed to use the DGZfP title “NDT Master”. This title certifies that this NDT expert has comprehensive knowledge of NDT methods, their advantages and disadvantages in comparison with other NDT methods, and extensive practical training in planning and organising inspection processes.

This new concept of level 3 training was well accepted by NDT companies and currently two training courses are taking place per year.



### 1.3 NDT Technologist

The NDT Technologist combines the NDT Master training with basic theoretical and practical engineering knowledge, but in a much shorter time and more practice-oriented than usual engineer studies. The following NDT methods will be trained during the NDT Technologist training:

- DGZfP NDT select;
- X-ray protection for designated NDT personnel;
- Radiographic testing (RT) level 3;
- Ultrasonic testing (UT) level 3;
- Eddy current testing (ET) level 3;
- Penetrant testing (PT) level 3;
- Magnetic testing (MT) level 3;
- Visual testing (VT) level 3;

Each NDT methods will start with the level 2 practice training as trainees will come directly from school without too much NDT knowledge.

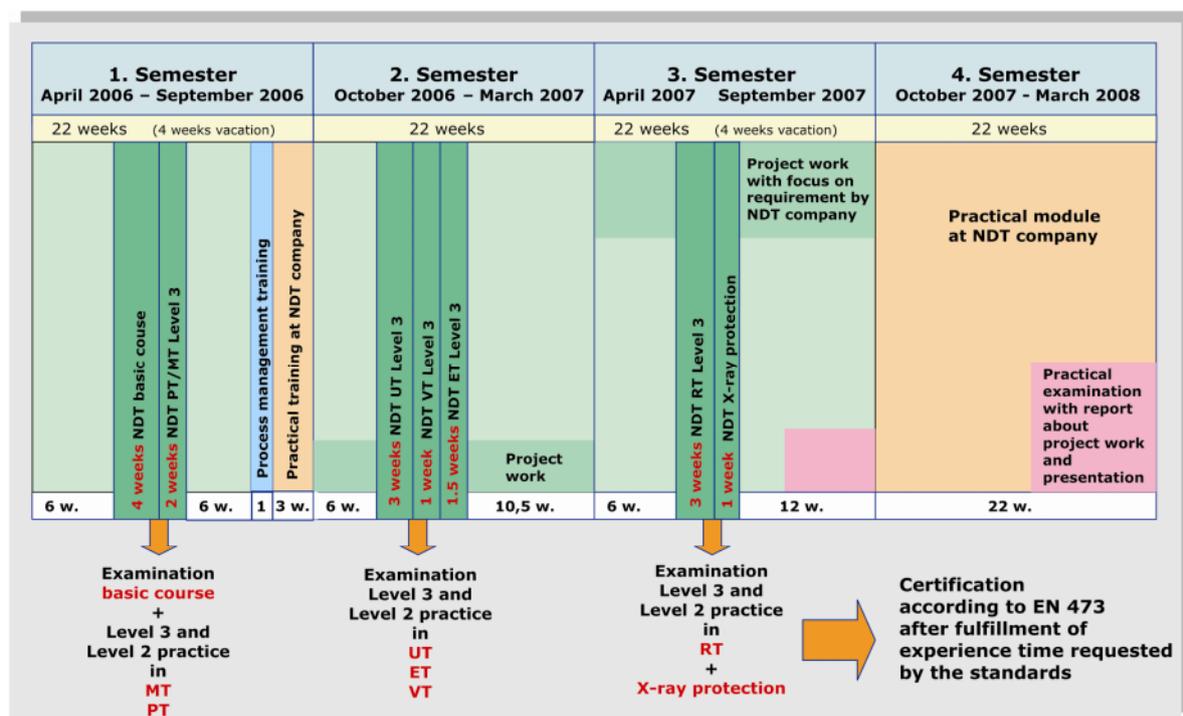


Figure 1.3. Semester plan for NDT Technologist

These studies can be performed in German or English, so that it may be also of interest for NDT companies outside Germany. The general structure of the 4 semesters is shown in Figures 1.

In Germany, agreements are performed with some universities which will recognised this education for trainees who will continue with engineering studies, e.g., in material sciences. They can start studies after the interim examination.

Costs for training services of Siemens and DGZfP and certification in line with EN 473 of in total 34,000 Euro are to covered by the respective NDT company or the student.

## 2. NDT Materials Tester

### 2.1 General

The training course *NDT Materials Tester* is addressed to young people mainly coming from secondary school.

In Germany, the Chamber of Commerce and Industry (CCI) is responsible for vocational education. Length, content and examination requirements are regulated by law. So, for the *ICC Materials Tester Metal Technique* a frame law defines scope, period and content of training and examination. During this education, the trainee receives only very little knowledge and practical training in non-destructive testing. The education programme covers mainly topics such as

- Related legislation
- Industrial safety
- Technical file
- Measurement and testing of geometries
- Treatment of materials
- Welding
- Maintenance of work equipment
- Determination of materials characteristics
- Micro biology
- Evaluation and recording
- Sampling
- Determination and modification of material properties
- Inspection of samples with defects and analysis of defect sources

Therefore, DGZfP together with its network partners described above developed a vocational training based on the CCI and legal requirements. In other words, a package of non-destructive testing courses was combined with the original materials tester training:

#### CCI **Materials Tester** Metal Technique

- ⇒ Main focus on NDT level 1 and 2
- ⇒ 3 ½ years training
- ⇒ State-approved examination

### 2.2 Modular training concept

The different partners of this training network provide with their specific competence:

- NDT companies contract the trainee(s), cover all training costs and provide with extensive practical training at their premises.
- Siemens Professional Education (SPE) enables fulfilment of legal requirements with respect to vocational school requirements, technical education, technical English, project and team work as well as support in selection of eligible candidates.
- DGZfP organises all NDT trainings and performs examinations according to

requirements of the EN 473 standard. The following NDT methods are included:

- Level 1 in MT, PT, RT, UT and VT
- Level 2 in MT, PT, RT and VT
- X-ray protection for NDT personnel

Due to the modular training concept and early creation of groups for team and project works it was possible to add the NDT training (14 weeks) to the usual CCI Materials Tester training programme without enlarging the training period.

Figure 1 shows the modular concept the 3 ½ training period with the different section performed by DGZfP, SPE or the NDT company. The arrangement is to a certain extent flexible and can be adjusted to the needs of the NDT companies, e.g. to locate the practical training into periods where shutdowns and inspections of plants are planned.

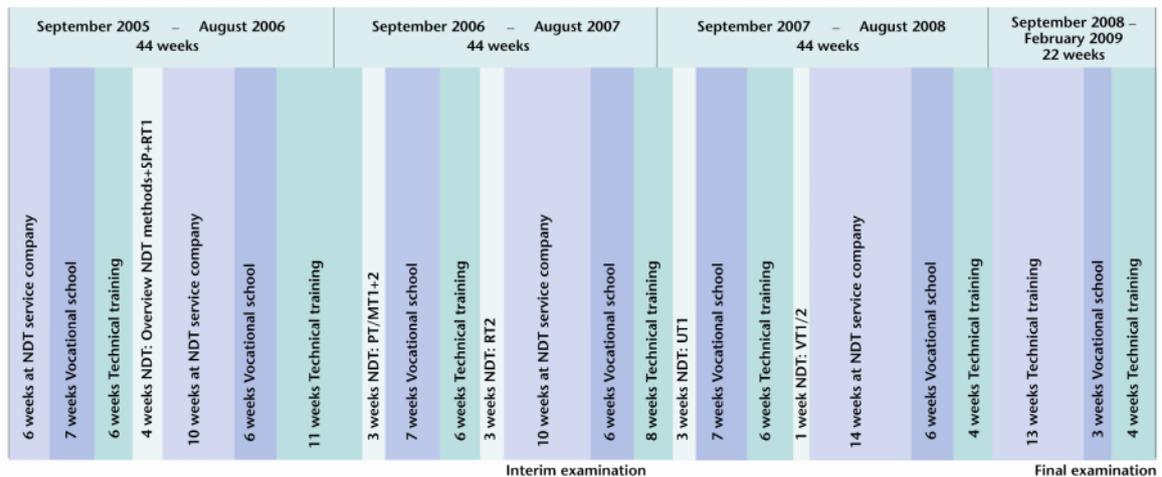


Figure 2.2.1. Modular training programme of ICC Materials Tester

Overview 1. Training Period (month 1-6)

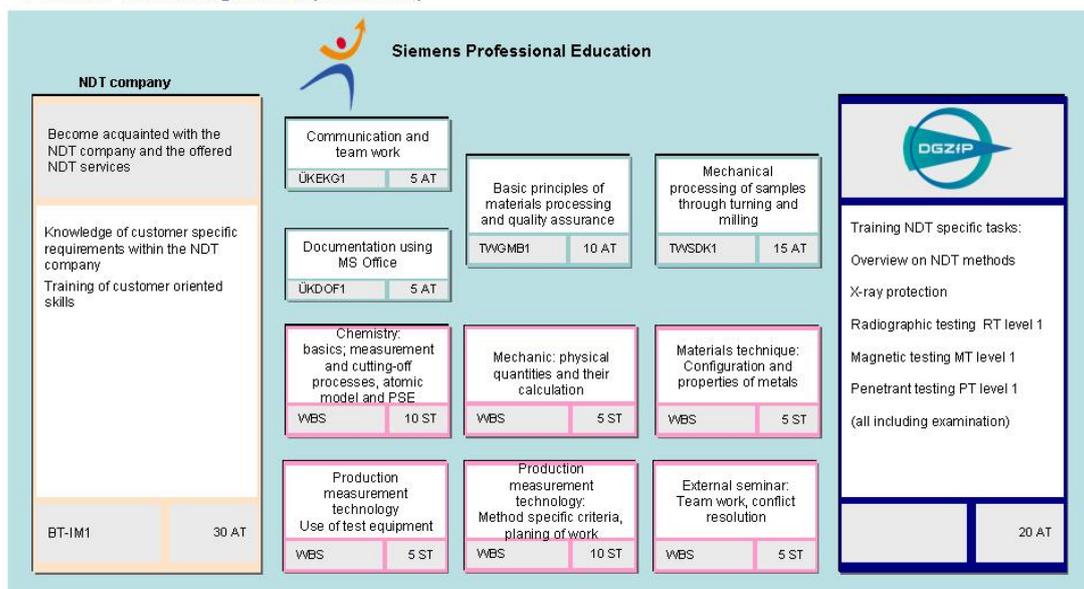


Figure 2.2.2. Training modules of the first education half-year

During the training the trainee will be qualified in the following NDT methods:

- Overview on NDT and different methods
- X-ray protection for NDT personnel
- Radiographic testing (RT) level 1 and level 2;
- Ultrasonic testing (UT) level 1;
- Penetrant testing (PT) level 1 and level 2;
- Magnetic testing (MT) level 1 and level 2;
- Visual testing (VT) level 1 and level 2.

Certificates will be provided after fulfilment of the requirements of EN 473. Due to the sections of practical training at the premises of the NDT service company in between the theoretical training at Siemens and DGZfP, requested practical experience periods in the different methods are fulfilled at the end of the vocational education. The NDT company has a young qualified and certified NDT tester with both, knowledge in destructive and non-destructive testing.

The first training with seventeen participants started in September 2005. In the meantime, all trainees have performed their first qualifications in the following NDT methods: MT and PT level 2, RT level 1 and X-ray protection. They will finalise their education in spring 2008.

Costs of 33,000 Euro to cover theoretical and practical training at Siemens and DGZfP (including certification in line with EN 473) together with additional costs for monthly apprentice's payments, travel and accommodation costs, ICC fees etc., are paid by the respective NDT company. However, these costs are already compensated during the education period as the trainee can join inspection teams during the practical training periods (approx. 45 weeks during education period) at the premises of the NDT company.



**Figure 2.2.3.** Trainees and trainer of the first training course

A second training will start in September 2006. Detailed information on the progress of the trainings and interim events are presented at the webpage [www.dgzfp.de](http://www.dgzfp.de) under the section **NDT Youth**.