

Training and Education Requirements for Occupational Radiation Protection in Industrial Radiography

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Introduction

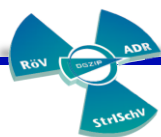
Training on radiation protection and radiographic testing is required by law and international standards.

- Law – Radiation Protection (RP)
 - Atomic Law
 - Radiation Protection Ordinance
 - X-Ray Ordinance
- International Standards – Radiographic Testing (RT)
 - DIN EN ISO 9712

Every Radiation Protection Officer (RPO) is liable for his in-plant authority.

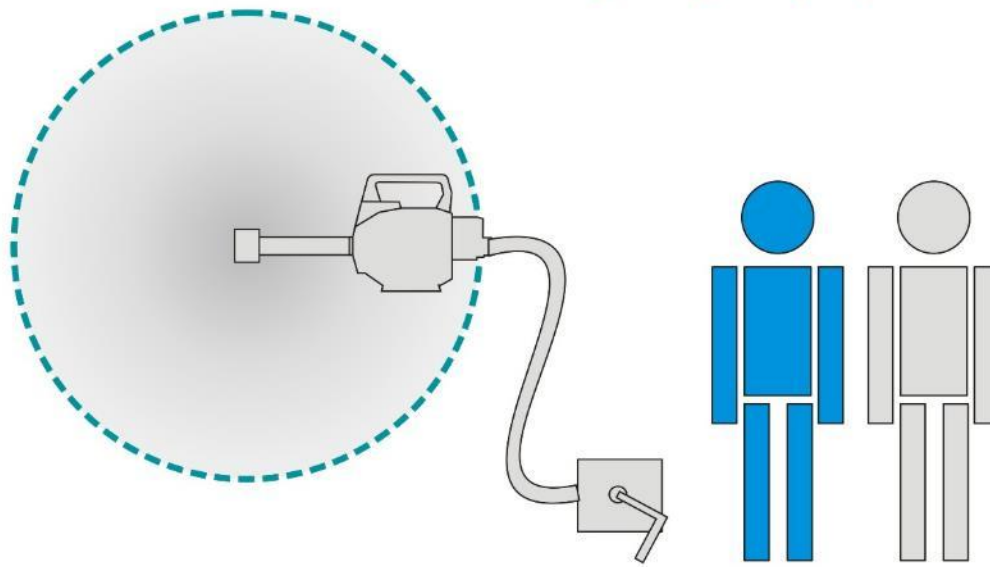
- RPO for overall direction
- RPO on site

Work experience is much more difficult to ensure.



On-site Situation

On-Site Controlled Area (40 $\mu\text{Sv/h}$)



two persons

- usually personnel of the NDT company owing the radioactive source

category A

- dose limit 20 mSv
- preventive occupational medical care

Introduced

- equipment technologies
- radiation protection

radiography

- level 1 or 2
- supervised by level 3 (prob. not present on site)

RPO – On Site

- 4 days RP course
- education not specified
- work experience 3 to 12 month

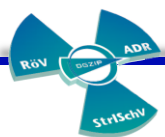
RP & RT – Requirements

German Training Guidelines - Radiation Protection (RP)

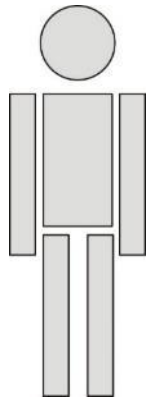
	Over all direction	On Site
Gamma-Radiography	<u>Training</u> : 5 d <u>Education</u> : technical or scientific <u>Work experience</u> : 3 - 12 month	<u>Training</u> : 4 d <u>Education</u> : not specified <u>Work experience</u> : 3 - 12 month
X-Ray-Radiography	<u>Training</u> : 4 d <u>Education</u> : technical or scientific <u>Work experience</u> : 6 - 8 month	<u>Training</u> : 2,5 d <u>Education</u> : not specified <u>Work experience</u> : 4 - 8 month

DIN EN ISO 9712 - Radiographic Testing (RT)

	Training in h	industrial NDT experience in month
Level 1	40 20 (e.g. graduated)	3
Level 2	40 + 80 20 + 40 (e. g. graduated)	3 + 9
Level 3	40 + 80 + 40 20 + 40 + 20 (e.g. graduated)	3 + 9 + 36 month 3 + 9 + 18 (graduated)



First steps in NDT – On Site Radiography

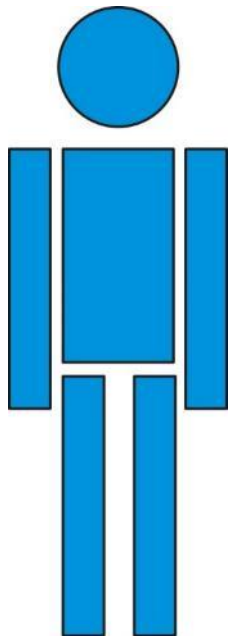


Qualification e.g. „*precision mechanic*“

reduced work experience in RP

RT: 10 % of req. NDT experience before Exam

4 day RP course



RP course - On Site Radiography

German Training Guideline according to
RP and X-ray Ordinance

Legal Regulations

Tasks of RPO

Natural Science Basics

Measuring Device and
Technique

RP Technique

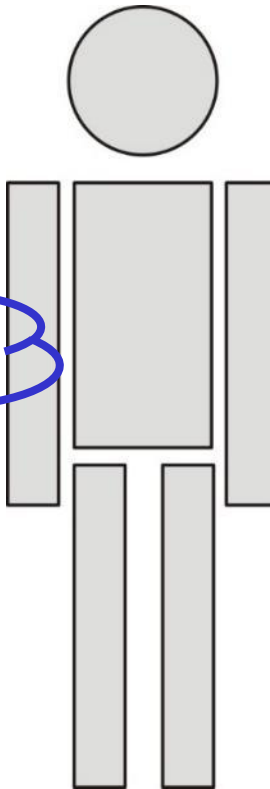
RP Safety and Security

Practicum and Demonstration

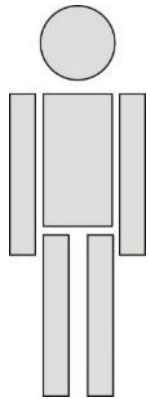
Exercises

Equipment Techniques

Exam



First steps in NDT – On Site Radiography



Qualification e.g. „*precision mechanic*”

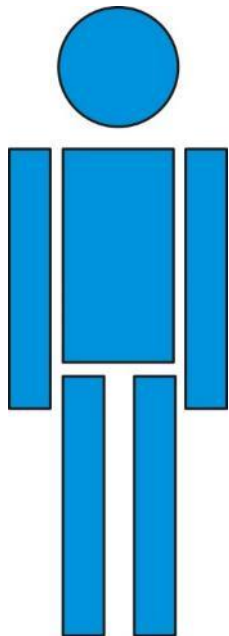
reduced work experience in RP

RT: 10 % of req. NDT experience before Exam

4 day RP course

7 day industrial NDT experience for RT level 1

10 day RT level 1 course



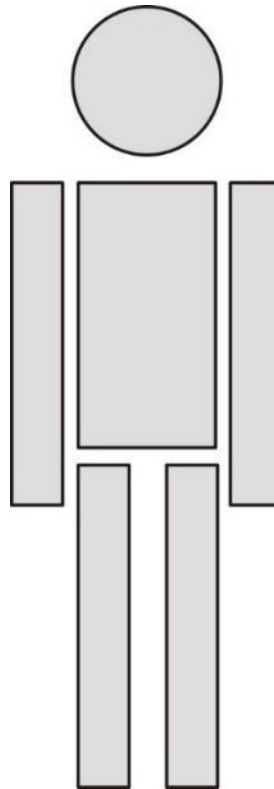
RT course – Level 1

DIN EN ISO 9712 & ISO/TR 25107

Introduction to,
terminology and history of
NDT

Physical principles of
the method and
associated knowledge

Product knowledge
and capabilities of the
method and its
derivate techniques



Equipment

Information prior to
testing

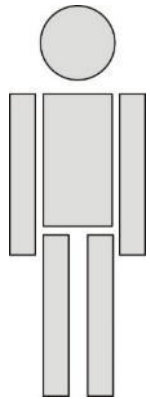
Testing

Evaluation an Reporting

Quality aspects

Exam

First steps in NDT – On Site Radiography



Qualification e.g. „precision mechanic“

reduced work experience in RP

RT: 10 % of req. NDT experience before Exam

4 day RP course

7 day industrial NDT experience for RT

10 day RT course

9 week industrial NDT experience for RT

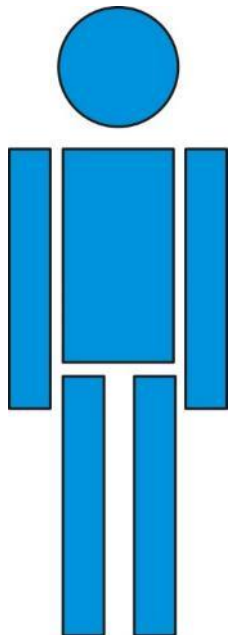
RT certification level 1

Third Party

3 month work experience supervised by RPO

Qualified for RP On Site

Competent Authority



On Site Radiography



Conclusion

RP and RT training provides a profound theoretic basis.

Exercises during the courses give first insights in practical work conditions for industrial radiography.

It is up to the employer to ensure that the trainee will be able to apply his knowledge in practice. And therefore ensure work experience in RP and industrial NDT experience for RT.

