CERTIFICATION SCHEME FOR PERSONNEL

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Requirements for the Certification of Personnel Engaged in Radiation Safety Levels 1 and 2

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Issued under the authority of the Governing Board for Certification
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FOREWORD

The Certification Scheme for Personnel (CSWIP) is a comprehensive scheme which provides for the examination and certification of individuals seeking to demonstrate their knowledge and/or competence in their field of operation. The scope of CSWIP includes Welding Inspectors, Welding Supervisors, Welding Instructors, Welding Examiners, Welding Quality Control Coordinators, Heat Treatment Operatives, Cathodic Inspection personnel, Drillstem Inspection personnel, Plant Inspectors, Underwater Inspection personnel, plastics welders and NDT personnel.

CSWIP is managed by the Certification Management Board, which acts as the Governing Board for Certification, in keeping with the requirements of the industries served by the scheme. The Certification Management Board, in turn, appoints specialist Management Committees to oversee specific parts of the scheme. All CSWIP Boards and Committees comprise member representatives of relevant industrial and other interests. TWI Certification Ltd (TWI Cert) is accredited by UKAS to ISO 17024.

TWI Cert understands the importance of impartiality in carrying out its certification activities, managing conflict of interest and ensuring the objectivity of all its certification activities, in accordance with BS EN ISO/IEC 17024.

ACCESS TO CERTIFICATION

Access to certification is not improperly restricted. The sole criteria for certification are given in this document (and any subsequent amendments) and no other criteria will be applied. Certification is not conditional on the candidate applying for other services or membership from TWI Cert, its parent, or any other groups or associations.

1 General

This document prescribes procedures by which personnel may be examined and, if successful, certificated for Radiation Safety Levels 1 and 2.

The competence assessment and assurance provided within this scheme document are designed to satisfy the guidance expressed in RG 0 “Guidelines on the competence of personnel undertaking engineering inspections”. Product sectors and industrial sectors are named, where applicable, in the CSWIP Inspector certification titles, roles and responsibilities.

2 Scope

This document prescribes procedures by which personnel may be examined, and, if successful, certificated for the duties of Level 1 Basic Radiation Safety and Level 2 Radiation Protection Supervisor as defined below. The responsibilities for these roles are listed below.

2.1 Level 1 personnel

An individual certified to Level 1 has demonstrated competence to carry out operations in accordance with written instructions under the supervision of Level 2 personnel. The individual has, under assessment, demonstrated the ability to set up the equipment, carry out the tests, record the results obtained, classify the results in accordance with written criteria and report the results. The responsibilities of a Level 1 do not include choice of the test method or technique to be used, and the assessment of test results.

2.2 Level 2 personnel

An individual certified to Level 2 has demonstrated competence to perform and direct testing in accordance with established or recognised techniques. The individual has, under assessment demonstrated the ability to choose the test techniques to be used; to set up and calibrate equipment; to interpret and evaluate results in accordance with applicable codes, standards and specifications; to carry out all duties for which a Level 1 individual is certified and to check that they are properly executed; and to translate codes, standards, specifications and procedures into instructions and organise and report the results of non-destructive tests. The individual has also demonstrated the ability to be familiar with the scope and limitations of the method for which they are certified, and be able to exercise assigned responsibility for on-the-job training and guidance of trainees and Level 1 personnel.

3 Eligibility for Examination

Candidates shall have a combination of education, training and experience adequate to ensure that they have the potential to understand the principles and procedures.

3.1 Training

3.1.1 Levels 1 and 2

To be eligible for certification in any method, the candidate shall provide evidence of successful completion of a training programme approved by TWI Cert. As a guide the minimum, training hours required are:

Method	Training Hours
Basic Radiation Safety (BRS)	16
Radiation Protection Supervisor (RPS)	24

3.2 Experience

3.2.1 Levels 1 and 2

To be eligible for certification, the candidate shall have the minimum experience indicated below in the method in which they are seeking certification:

Method	Months of Experience
Basic Radiation Safety (BRS)	0
Radiation Protection Supervisor (RPS)	6

Notes:

Work experience in months is based on a nominal 40h/week (160 h/month). When an individual is working more than 40h/week, they may be credited with experience based on the total hours, but they shall be required to produce evidence, of this experience.

Candidates must provide evidence of experience by providing relevant information authenticated by a senior responsible person in the candidate's employing organisation or by a major client.

3.3 Mature candidate route

A mature candidate route offering exemption from the formal training is available for candidates who are able to demonstrate having at least five years recent experience in their chosen method and can show documented evidence of having completed a course of training compliant with provision of the relevant CSWIP syllabus. Training courses completed shall be approved by CSWIP prior to the examination.

If a mature candidate is unsuccessful in obtaining certification it will be necessary to undertake an approved course followed by a full re-examination.

3.4 Vision requirements

The candidate shall provide documented evidence of satisfactory vision in accordance with the following requirements:

a) Unaided or corrected near visual acuity in at least one eye shall be such that the candidate is capable of reading N4.5 Times Roman or Jaeger number 1 or equivalent letters (having a height of 1.6mm) type at a distance of not less than 30cm with one or both eyes on a standard reading test chart or should be conducted in accordance with BS EN ISO 18490, Non-destructive testing – Evaluation of visual acuity of NDT personnel, using the “tumbling E” chart.

b) Colour vision shall be sufficient that the candidate can distinguish and differentiate contrast between the colours or shades of grey used in the NDT methods concerned. All candidates and holders of CSWIP certification will be required to have a colour perception assessed by the Ishihara 24 plate test, in the event of colour perception deficiency, indicated by misreading any of the first 17 plates, the employer shall be notified, a further ‘trade test shall be carried out by the employer to ascertain whether the detected colour perception deficiency affects the individual’s ability to perform the NDT method for which he is certified.

The evidence must be in the form of a certificate issued by a medically recognised person or a trained appointed representative of the medically recognised person within the previous 12 months, covering all the above points.

With all the above eligibility requirements the onus is on the candidate to provide the necessary evidence prior to examination. An examination appointment will not be confirmed until the evidence has been received. Subsequent to certification, tests of visual acuity shall be carried out annually.

Personnel who satisfy most but not all of the other entry requirements and who may have alternative attributes which they consider should be taken into account may have their individual cases assessed by the appropriate CSWIP Management Committee. Such applications should be directed to TWI Cert in the first instance.

4 Application for Examination and Fees

When the eligibility for examination has been achieved, the next step is to take the examination.

Candidates will be required to submit an application form. All the information requested must be on these forms. No applications can be considered confirmed until receipt of correctly completed documents. Application forms ask for specific details of experience and training, and require commitment to the CSWIP Rules, and must be signed to the effect that these details are correct.

In the event of a false statement being discovered on forms any examination undertaken will be declared null and void. A certificate is automatically invalidated if there are any outstanding examination fees in respect of that certificate.

Candidates proved to have cheated, or found to have attempted to remove or found to have removed examination material in a CSWIP examination will not be accepted as a candidate for any CSWIP examination for a minimum period of five years from the date of the examination where cheating, attempt to remove or remove all of examination material, was established to have taken place.

Examinations may be taken at any one of a number of Test Centres in the UK and overseas. Lists are available on request.

5 Examination Content

The qualification examinations include a multiple choice examination for each level of competence. The time allowed for examinations comprised of multiple-choice questions is 2 minutes per question.

5.1 Level 1 and 2 Examinations

5.1.1 Level 1 Examination (Basic radiation safety)

- 30 multiple choice questions
- Time allowed 45 minutes
- Pass mark 70%.

5.1.2 Level 2 Examination (Radiation protection supervisor)

- 40 multiple choice questions
- Time allowed 60 minutes
- Pass mark 70%.

5.1.3 Grading

To be certified the candidate shall obtain a grade of at least 70% in each section of the examination.

6 Certification

6.1 Results notices

All candidates will be sent a results notice. This notice will also be sent to the organisation paying the examination fee, if not paid by the candidate.

Results notices will indicate whether the candidate has achieved success or otherwise in the examination, the marks gained in each part of the examination, whether retests are allowable and brief reasons for failure of any part of the examination. The personal details recorded shall be those provided by the candidate.

6.2 Successful candidates

Two copies of a certificate of proficiency will be issued to the sponsoring organisation or person. Duplicate certificates to replace those lost or destroyed will be issued only after extensive enquiries.

6.3 Unsuccessful candidates

Candidates who fail to pass the initial examination may attempt one retest on those parts of the examination in which success was not achieved. The retest must be completed within one year of the initial test; otherwise candidates will have to repeat the complete examination.

The retest, (or complete re-examination) may not be taken within 30 days of the previous examination, unless further specific training is undertaken.

6.4 Period of validity

The certificate is valid for five years from the date of completion of the initial examination. The radiation safety certificate holders may only be renewed by examination every five years.

Certificates are only valid provided they:

a) Are within date.
b) Are on standard cream CSWIP paper bearing the CSWIP logo in black on gold signed by an officer of CSWIP and embossed with the CSWIP stamp.
c) Have been signed by the individual to whom the certificate is awarded.
d) Are accompanied by a valid official CSWIP identity card.
e) Accompanied by a valid visual acuity test issued within the previous twelve months.

Photocopies are unauthorised by CSWIP and should only be used for internal administrative purposes.

7 Complaints and appeals

An aggrieved party in a dispute which considers itself to have reasonable grounds for questioning the competency of a CSWIP qualified person may petition the Governing Board for invalidation of the certificate. Such a petition must be accompanied by all relevant facts, and if in the opinion of the Board an adequate case has been presented, a full investigation of the circumstances under dispute will be initiated.

Appeals against failure to certify or against invalidation of the certificate may be made by the holder upon application in writing to the Governing Board.

8 Records

TWI Cert maintains records of successful and unsuccessful candidates. These records are accessible to the Governing Board or its nominee's at all reasonable times.

9 References

- Factory Form 324: Precautions in the use of Ionising radiation in Industry.
- Recommendations of the International Commission on Radiological Protection. ICP Publication 9.
- Work with ionising radiations COP L121. London, Health and Safety Executive; 2000; ISBN 9780717617463.
- Ionising Radiations Regulations 2017 (IRR17)
- Radiation Safety for Site Radiography: Kluwer Publishing Ltd 1986.

10 Addresses

For further general information contact:

TWI Certification Ltd
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For specific information on examinations and tests and arranging for them to be carried out, contact the approved Examining Body:

TWI Training and Examinations
Granta Park
Great Abington
Cambridge CB21 6AL

Phone: +44 (0) 1223 899000
Email: trainexam@twi.co.uk

Appendix 1

1 Examination Syllabus

1.1 Level 1 Radiation Safety Level 1 Basic Syllabus

a. Basic Concepts

Matter, molecules, elements, atoms, fundamental particles, atomic number, mass number, isotopes, radionuclides. Types of radiation: α, β, γ. Radiation energies (eV). Production of X rays. Activity, decay, half-life. Sealed and unsealed sources. Contamination. Ionisation.

b. NDT Equipment

Gamma radiography: Remote exposure containers; Collimators. X-ray generators. Linear accelerators. X and γ-ray compounds. Site radiography.

c. Radiation Units and Dose Limitation (1 hour)

Quantities and units

Activity (Bq). Absorbed dose (Gy). Dose equivalent (Sv). Dose rate (uSv/hr). Conversion from old to SI units. Commonly used prefixes.

d. A brief summary of legislation

- EPR 2010/2011 (England, Wales, & Scotland)
- RSA 93 (Northern Ireland)
- Ionising Radiations Regulations 2017 (IRR17)
- Approved Code of Practice Parts L121 Work with Ionising Radiation.
- Guidance Notes: “Radiation Safety for Site Radiography” ECIA, London
- Radioactive Material (Road Transport) Act 1991
- Radioactive Material (Road Transport) Regulations
- Radiation safety for site radiography, Engineering Construction Industry Association (ECIA), London.
- The high-activity sealed radioactive sources and orphan sources regulations 2005.

e. Dose limitation

Justification, optimisation, dose limits. Regulatory Dose Limits. Reference levels: 7.5 μSv/hr

f. Biological Effects

Cell, nucleus, DNA, chromosomes. Cellular damage, varying radiosensitivity. Acute macroscopic effects: stochastic and deterministic effects. The effects of chronic exposure.

g. Principles of Protection from External Radiation

Basic parameters: time, distance, shielding, source outputs. Half value and tenth value thickness.

Practical aspects: The use of enclosures versus site radiography, Wind-out containers, X-ray sets, collimators, Safety and warning systems, Radiography compounds, Required interlock systems for compounds, Communication between radiographs

h. Shielding Calculations

Exercise on manipulation of radiation units.

Exercises on the following: Calculating source and X-ray intensity; Calculating dose from dose-rate, use of inverse square law, use of half value and tenth value thickness for calculating shielding.

i. Personal Dosimetry (½ hour)

Classification – medical surveillance, dose assessment, ADS dose record keeping.
Types of dosimeter – film badges, TLDs, personal alarm monitors.
ALARP – investigation.
Exposure – investigation.
Over-exposure – investigation, notification.
The requirements of the Outside Workers Regulations.
Use of Radiation Passbook for outside workers.

j. Radiation Monitoring

Types of monitor (direct, indirect reading) correct use. Correction factors. Testing and calibration. Frequency of monitoring. Record keeping.

k. Specific Requirements of Regulations (¾ hour)

Source accountancy. Controlled and Supervised Areas. RPA and RPS. Local Rules. Transportation of sources.

l. Accidents and Hazards in Perspective

Accident case histories. Effects of low radiation doses, sources of information on radiation risks. Risk estimates and comparison with other risks.

m. Emergency Procedures

Case studies of incidents related to industrial radiography. Transport incidents. Emergency equipment. Actions to take in event of emergency. Contingency plans.

1.2 Level 2 Radiation Safety Supervisor Syllabus

The syllabus for Level 2 Radiation Safety covers the same syllabus as Level 1 but with more emphasis on the supervisory and recording aspects of the subject.