



NATIONAL WELDER TRAINING STANDARD

DOCUMENT No. NWTS-CP1-1-04

Code of Practice 1: Training of Welding Operatives

Part 1: Manual and Semi-automatic Arc Welding Processes

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Issued under the authority of :



The Welding Institute, Professional Division under the guidance of the

Association for Welding and Fabrication Training and Education

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Foreword

Historically, much of the welder training conducted in the UK has concentrated on the achievement of practical skills alone and, increasingly, welding personnel are now trained through ad hoc courses or on-the-job programmes, either for a specific application within a particular organisation, or to meet the needs of individuals seeking employment. Such training is a matter of agreement between client and training organisation. The coverage of key matters such as safe working, protecting others, quality, risk and consequences of weld failures and underpinning process knowledge is often not prescribed and the final assessment of skill and knowledge may be unsatisfactory.

An important feature of training and employment is compliance with the requirements of the *Provision and Use of Work Equipment Regulations, 1998* (WER) which came into force in December of that year with the publication of Statutory Instrument SI 1998-2306. Amongst the obligations they place on employers, and consequentially on Training Providers, are those relating to training given in Section 9 of the Regulations which state:

1. *Every employer shall ensure that all persons that use work equipment have adequate training for purposes of health, and safety, including training in the methods which may be adopted when using the work equipment, any risk which such use may entail and precautions to be taken.*
2. *Every employer shall ensure that any one of his employees who supervises or manages the use of work equipment has received adequate training for purposes of health and safety, including training in the methods which may be adopted when using the work equipment, any risks which such use may entail and precautions to be taken.*

The training of welding personnel in many cases has not met the requirements of 'adequate' as stated in, and implied by, the Regulations. The coverage of key matters of safety and competence which is an absolute requirement of WER Section 9 is often not prescribed and the final competence achieved may not be adequate.

This is a potentially serious situation because of the safety-critical nature of many welded joints and the potential danger to workers from the use of and in proximity to welding and cutting processes.

1 GENERAL

1.1 Structure of the Standard

This Code of Practice is one of four which together will form a national Standard for the training of welders, covering practical training for skills, essential job knowledge, welder approval and requirements for training organisations. The four codes are:

CP1 Training of Welding Operatives

CP2 Training of Craftsman Welders

CP3 Training of Master Welders

CP4 Training of Supervisory Staff

CP1 may also serve as a foundation course for those entering welding and wishing to progress to *Craftsman Welder* or *Master Welder* levels, either through National Welder Training Standard (NWTS) programmes or recognised Technical Certificate (Vocationally Related Qualification) courses.

The scope of Part 1 of this code is limited to Manual Metal-Arc (MMA), Metal Inert Gas (MIG), Metal Active Gas (MAG) and Tungsten Inert Gas (TIG) welding processes.

For the purpose of this Code, a *Welding Operative* is defined as a person having limited welding competence involving a single process, a restricted range of welding positions, one group of materials and a small number of applications.

1.2 Objectives of NWTS for Welding Operative Training

The objective of CP1 is to specify the minimum requirements for training a *welding operative* in the use of a single process to produce fit-for-purpose welds for specified applications, to prove competence in working correctly and safely, and to provide an adequate understanding of the process, its application, hazards and safe working practice, and the risks and consequences of weld failure.

The knowledge base prescribed in this Code supports the job knowledge statement included in BS EN 287/ISO 9606 *Approval Testing of Welders*. For welders already holding certification under this Standard, the knowledge content of this code may be taken as a separate course and examination programme.

1.3 Implementation

The Scheme is delivered by *NWTS Authorised Training Providers* or, initially, by Providers provisionally Recognised (see Section 6). Courses offered in accordance with CP1 may only be advertised or referenced as such when delivered by Recognised or Authorised Providers.

The integrity of the scheme depends on the competence of those who contract to provide training according to NWTS Rules and the requirements for Recognised and Authorised Training Providers is given in Section 5. Training Providers are subject to random audits.

Recognised and Authorised Training Providers are required to control their operations through the application of an approved Quality Manual, see Section 5.5.

Authorised Training Providers may use the NWTS CP1 logo on letterheads and documentation.

Witnessing of qualification testing by an *Independent Examiner* is required (see Section 3.4).

1.4 Procedure

The outcome of the training programme shall be specified either by the employer for sponsored trainees or by the Training Provider for individuals without sponsorship. The specification shall include a weld quality requirement and all practical training shall be covered by written welding instructions or a welding procedure specification.

The Training Provider shall prepare written recommendations for the training and testing programme based on either the employer's requirements or the individual trainee's needs and capabilities.

It is recommended that practical skills are assessed using the qualification testing regimes specified by BS EN 287/ISO 9606; otherwise special tests are needed. There is a final assessment, alongside the final qualification testing, for knowledge and understanding.

The welding of qualification test pieces, their examination, measurement and testing, and the theoretical examination are witnessed by the Independent Examiner. The results are checked by the Examiner who authorises the Pass/Fail notification. The result is notified to the trainee and employer using the *Results Notification Form* but the NWTS Certificate is issued centrally, see Section 6.

Accreditation of prior achievement for those having a minimum of two years' satisfactory industrial experience, authenticated evidence of having already completed training equivalent to that specified in this Code and gained recognised approval qualifications, NWTS Certification may be gained by successfully completing the course theory and examination at an Authorised Training Provider. Furthermore, if the candidate holds a recognised vocationally related qualification, exemptions from the CP1 examination may be granted.

1.5 Certification

Successful candidates are awarded an *NWTS Welding Operative Certificate*, which identifies the scope of approval gained together with certification for any Standard qualification tests achieved.

Certificates are valid for a period of five years. Renewal requires either evidence of satisfactory production records or retest.

Any specific approval qualifications gained, e.g. BS EN 287/ISO 9606 or ASME, will be governed by the time limitations and prolongation rules of the particular Standard.

1.6 Entry Appraisal of Potential Candidates

When the aptitude of a candidate for welding, having no previous experience, is not known, it is prudent to apply simple tests to determine whether or not participation in the training programme would be worthwhile. Such tests include understanding verbal and written instructions, attitude, eyesight, concentration, numeracy, literacy and an eye-hand 'co-ordination' test.

Candidates for employment must be at least 16 years old.

1.8 Vocational education of 14-19 Year Old Pupils

This Code may be a useful basis for the instruction of 14-19 year old pupils in general education who are seconded part-time for vocational training to Colleges of Further Education. Colleges should register their interest with TWI.

2 CP1 - THE WELDING OPERATIVE TRAINING PROGRAMME

The Programme consists of two parts:

Part 1: For each process, this Part is common whatever the specific outcome of the Programme. It covers essential job knowledge and the attainment of basic welding skills. It supports the job knowledge requirements of BS EN 287/ISO 9606. Much of this part is also common to all arc welding processes and extension of training to other processes does not require this material to be repeated.

It is suggested that the practical work in Part 1 be carried out using carbon-manganese steel whereas, in Part 2, the material relevant to the trainee's future work shall be used.

Part 2: This Part is designed by the Training Provider to meet the specific training needs of the employer or individual trainee. It provides essential product-related job knowledge, and practical training, to achieve the specific outcomes required.

The *Training Hours* shown against each component of the programme are recommended minimum times and, in practice, will depend on the capability of the trainees and, in Part 2, also on the nature of the product.

2.1 Part 1: Programme for Manual and Semi-Automatic Arc Welding

Note: Topics specific to an industrial process are given, where necessary against the process abbreviation in each section.

2.1.1 Using electricity for arc welding (classroom) (1.5hr)

Objective

- Know the principles of arc welding

Scope

- What is fusion welding
- Basic facts of electricity: voltage (V), current (A), Alternating and Direct Current, resistance, power, mains supply, transformers, rectifiers; inverters
- How electricity is used in arc welding: the electric arc as heat source, simple welding circuits
- How a fusion weld is formed; principal features, role of filler metal; shielding of welding zone
- Principal welding terms

Outcomes

- Describe the basic principles of arc welding
- Explain how a weld is formed in arc welding

2.1.2 The process and equipment you will use (classroom and workshop) (3hr)

Objectives

- Know the principal features and operating characteristics of the welding process
- Know the equipment and how it is controlled
- Know the principal types of consumables used

Scope

- How the process works: basic principles; circuit and mechanical diagrams
MMA: The metal arc; consumable covered electrode; metal transfer
MIG/MAG: The metal arc; consumable electrode wire, metal transfer, wire feed; shielding gas (inert and active)

- TIG: The simple arc; non-consumable electrode; filter wire; shielding gas
- Power source components and their function; output control. Welding and return cables; earthing, clamps.
- MMA: The electrode holder
- MIG/MAG: Wire feed mechanism; welding gun. Shielding gas supply
- TIG: Welding torch; tungsten electrode; sharpening; arc starting. Shielding gas supply.
- Consumables for arc welding:
 - MMA: The covered electrode; function of core wire and covering; types of electrodes; care and storage
 - MIG/MAG/TIG: The electrode or filler wire; types of wire; care and storage; function of inert and active shielding gases; types of gas
- Welding parameters: open circuit and arc voltage; welding current; electrode polarity in DC welding; electrode or wire size; VA relationship; duty cycle; typical operating parameters; heat input
- Practical explanation of the equipment and accessories and guided tour of components. Rules for care of equipment
- How welding parameters are controlled

Outcomes

- Explain how the welding process works and the principal items of equipment needed
- Describe the types and functions of the consumables
- Name the parameters involved
- Identify the components, accessories and controls of a typical welding set-up

2.1.3 What are the health and safety hazards and safe working practices in arc welding (classroom)

(2.5hr)

Objective

- Know the principles of risk assessment
- Know the hazards of arc welding
- Know how to work safely in the welding/fabrication shop (and on site if applicable)

Scope

- Radiation from the electric arc; arc eye
- Electrical hazards

- Fumes and gases from the parent metal, surface coatings and from consumables; respiratory hazards; work in 'confined' spaces
- Hot metal and emitted particles; burns, eye injuries
- Fire and explosions
- Risks arising from chipping, wire brushing, cutting, gouging and grinding
- Risks from welding and cutting gases and from compressed gas cylinders
- Planing work and ways of working to reduce risk
- Personal protection for eyes, face, body, hands and respiratory protection. Correct selection, fitting and maintenance.
- Control of fumes and gases; general and local ventilation
- Safe working and control of atmosphere in confined spaces
- Safe working in the fabrication shop: general workshop conditions; dust, handling heavy and hot material; care in presence of moving vehicles and machinery; avoiding falls due to trailing cables and obstructions; protecting others from welding hazards; welding screens
- Emergency procedures
- Safe working with hand held power tools for example grinding, wire brushing and chipping
- Safe working with welding hand tools
- Safe use of compressed gas equipment
- Protecting the environment, safe disposal of waste materials
- Key legislation in relation to welding: The European '6 Pack' inclusive of *Health and Safety at Work Act; Control of Substances Hazardous to Health Regulations; Personnel Protective Equipment at Work Regulations, Provision and Use of Work Equipment Regulations*
- Procedure for assessing the risks involved in a given welding activity

Outcomes

- Identify dangers from use of electricity and welding arcs
- Explain the origins of fumes and gases; the risks to health
- Identify the risk of burns, fire, explosion and eye injuries
- Describe and demonstrate the essential personal protective equipment for arc welding
- Explain the need for and correct use of ventilation and local fume extraction
- Identify the special precautions needed in 'confined' spaces
- Identify major hazards present in fabrication shops
- Identify methods for safe disposal of waste materials from welding
- Demonstrate safe working with power tools used in welding

- Explain the risks from welding gases and from the use of compressed gas cylinders
- Identify the key legislation governing welding activities
- Explain how the risks of given situations are assessed

2.1.4 Preparing to weld (workshop)

(2hr)

Objective

- Know how to set up and take care of the equipment and identify potential safety hazards; understand the purpose of the welding procedure specification.

Scope

- Setting up the equipment ready for welding; shut down procedures
- Checking the equipment for safety; potential faults
- Interpreting simple fabrication drawings and weld symbols
- Instructions for welding; the welding procedure specification and the importance of following it
- Selection and care of personal protection equipment
- Check that ventilation and local fume extraction equipment is in place and working correctly.

Outcomes

- Demonstrate how to set up and check the equipment, including safety checks
- Demonstrate correct selection of personal protection equipment
- Describe how to take care of equipment
- Interpret a simple fabrication drawing to determine weld types and locations
- Explain the purpose and content of the welding procedure specification
- Demonstrate how to shut down the equipment

2.1.5 Striking and maintaining an arc (workshop)

(4hr)

Objective

- Learn how to strike, maintain and restrike an arc; technique for continuing and ending the weld bead – as appropriate to the process in use

Scope

- Use a simple WPS to set parameters and select consumables

- Deposit weld beads on plate in flat position; striking, maintaining and restriking an arc; correct manipulation of electrode, welding torch or gun; technique for continuing and ending the weld bead
- Note effects of adjusting parameters; importance of heat input
- Deposit a multi-layer pad of weld metal on plate

Outcomes

- Produce satisfactory weld beads on plate that demonstrate fusion of the parent metal
- Produce a multi-layer pad of weld metal on plate having uniform appearance

2.1.6 Making a simple welded joint (classroom and workshop) (4hr)

Objectives

- Know the basic types of welds and joints and their features, the welding positions, and how you should check your work
- Achieve single run fillet welds in tee joints in plate in the flat (PA) position having a good level of weld quality

Scope

- Fillet and butt welds
- Welding positions; designations, range; limitations
- Basic types of welded joints in plate and tube
- Control of workpiece distortion
- Visual checking and measurement of weld size, excess weld metal, penetration, undercut, profile and finish
- Use of the WPS to set parameters and select the correct consumables
- Practice to produce welds of good appearance and satisfactory fusion
- Destructive tests to reveal internal weld quality, including demonstration of macrosection and fracture tests

Outcomes

- Describe the basic types of joint produced by the welding process and identify their principal features
- Name the welding positions
- Demonstrate how the external features of the weld are checked
- Explain the causes of distortion during welding
- Explain how defects may arise in welds
- Produce fillet welds having good appearance, absence of major defects, and adequate penetration and fusion

- Understand the limits imposed by the welding procedure specification

2.2 Part 2: Specific Training Programme

The trainee will now focus on the specific objective of making fit-for-purpose welded joints in:

- A specified material
- A given thickness range
- Given positions

For employer sponsored trainees, the client should specify the weld quality required, the welder qualification tests, and the welding procedures. In the absence of these items the Training Provider must:

- Agree with the client an appropriate level of weld quality to be achieved, appropriate to the function of the product
- Agree with the client the type of qualification test needed to confirm that objectives have been achieved
- Prepare WPS's to be used in training and qualification

For individuals not employer sponsored, the Training Provider will prescribe a specific programme in consultation with the client and, when appropriate, the funding source. The programme will generally aim to provide skills appropriate either to a designated employer or to the needs of local industry.

2.2.1 Employer sponsored trainees

2.2.1.1 What you need to know about the product which you are to weld (classroom)

(2hr)

Objective

- Understand the nature of the product, the effect of welding on the material to be welded, what has to be achieved and the consequences of failure from faulty welds.

Scope

- Nature of the product to be fabricated
- Specific material of construction; effects of welding, defects which may occur
- Pre- and post-weld heat treatment; control of interpass temperature (*if appropriate*)
- Locating components for welding; fit up; control of distortion
- Types of welded joints to be made

- Weld quality and dimensional tolerances to be achieved
- Checking weld quality
- Requirements for passing the Qualification Test
- Dangers of faulty welds and consequences of failure

2.2.1.2 Client specific practical training (workshop)

The specific training will be designed by the training provider to meet the client's objectives and the duration will depend on the level of skill required. It will comprise tutorials and practice leading to the achievement of welds of the specified quality.

Note; As this part of the course will be client specific, the following is by way of example only.

Training Specification (example)

Product: Light structural steelwork fabricated from carbon-manganese steel plate, angle and channel sections

Types of weld: Fillet welds only

Thickness range: 6-12 mm

Material: Carbon-manganese steel

Welding process: MMA

Welding positions: PA, PB

Joint types: Tee joints: plate to plate
plate to section

Lap joints: plate to section
section to section

Welding procedure specification: as supplied by client

Weld quality: as specified for profile, size, undercut, finish, surface breaking defects

Welder qualification testing and acceptance requirements: BS EN 287/ISO 9606 for fillet welds

Practical training

The training will comprise largely the achievement of the required quality in:

Tee joints in plate, using a single thickness in the 6-12mm range

Positions: PA and PB

Parameters: from WPS

When the correct external visual quality is achieved, a weld will be sectioned to check internal quality and penetration. If satisfactory, approval testing to BS EN 287/ISO 9606 will be conducted.

2.2.2 Individual trainees

2.2.2.1 What you need to know about the welded joints you are about to make (classroom)

(2hr)

- The 'product': fillet welded T joints and butt welded joints in carbon-manganese steel plate
- Effects of welding on parent metal and defects which may occur in the welds
- Locating components for welding; fit-up; control of distortion
- Weld quality to be achieved: Level C, BS EN ISO 5817
- The qualification testing regime: BS EN 287/ISO 9606
- Checking weld quality
- Dangers of faulty welds and consequences of failure

2.2.2.2 Practical training (workshop)

The following example is by way of guidance only

Training specification

- Trainees shall weld Tee, Lap and Butt joints in 8 and 15mm plate
- Type of weld; fillet and butt
- Material: carbon-manganese steel
- Welding position; PA, PB
- Welding procedure specification; supplied by Training Provider

When correct external visual quality is achieved, a weld in each type of joint and each thickness will be cut and macro-sectioned to check internal quality and penetration. If satisfactory, qualification testing to BS EN 287/ISO 9606 will be conducted.

3 APPROVAL TESTING AND JOB KNOWLEDGE EXAMINATION

3.1 Weld Quality Specification

The specification provided by or agreed with the client establishes the minimum level of weld quality required. It will provide requirements as applicable for:

Visual appearance
Profile
Excess weld metal

Weld size (fillet welds only)
Penetration
Undercut
Internal weld quality
Mechanical properties

The minimum level of weld quality to be achieved in the welder qualification test pieces under CP1 for steel is that identified by Level D of BS EN ISO 5817 Part 1: Arc welded joints in steel – guidance on quality levels for inspections. For other materials, the equivalent levels given in Parts 2-5 of this Standard should be used. However weld quality must be adequate for the service conditions of the product and, for all safety critical applications, an appropriate level must be specified by the client and the testing regime presented in BS EN 287/ISO 9606 followed.

3.2 Approval Testing and Certification

Test pieces: the form shall be agreed with the client as being appropriate to the application and should preferably conform to BS EN 287/ISO 9606 or an equivalent standard. Test pieces shall be clearly identified and recorded.

Welding: test pieces shall be welded in relevant positions according to the specified welding procedure, witnessed and signed for by the Independent Examiner.

Testing: Test pieces shall be checked in the presence of the Independent Examiner by the following methods:

- For all testpieces
 - i) Visually for surface appearance
 - ii) Measurement, as appropriate to the type of joint, for excess weld metal, penetration, undercut, throat and leg length. A dedicated weld size measuring gauge should be used
 - iii) Fracture testing (may be omitted if radiographic or ultrasonic testing is specified)
- As required by the specification
 - iv) Macro examination
 - v) Dye penetrant or magnetic particle testing for surface breaking or near surface defects
 - vi) By ultrasonic or radiographic testing for internal defects
 - vii) By removal of specimens for mechanical testing

The results shall be recorded and signed for by the Independent Examiner.

Certification: Trainees who are successful in the practical and knowledge tests will shall be awarded an *NWTS Welding Operative Certificate*, which identifies the scope and range of approval gained in terms of:

Qualification testing regime e.g. BS EN 287/ISO 9606

Material Group

Form of material

Process

Consumables

Type of joint

Thickness range

Pipe outside diameter (if applicable)

Position range

Weld quality assessment standard, e.g. BS EN ISO 5817 Level D

Note: It is recommended that qualification testing be carried out in accordance with a recognised Standard wherever possible

3.3 Assessment of knowledge and understanding

The trainee shall be assessed for knowledge and understanding of the theoretical content of the course in the presence of the Independent Examiner. The assessment is by a multi-choice answer paper, which is divided into two parts:

Part A: All questions mandatory: Pass mark 90%

Part B: Pass mark 70%

In this assessment the trainee must demonstrate that he/she:

- Understands how electricity is used for arc welding
- Understands how a weld is formed
- Knows how the welding process works and the parameters involved
- Knows the principal components of the welding equipment and their function
- Knows the hazards of arc welding and their effects, and understand how to work safely in the fabrication shop
- Knows the key Regulations governing welding activities
- Understands the meaning of confined spaces and the hazards involved
- Is wearing the correct personal protective equipment
- Can assess the risks of given situations
- Can set up the equipment correctly, check it for safety and maintain it in good condition
- Knows the different types of consumables and requirements for their use and storage
- Understands the principles of the Welding Procedure Specification
- Can explain the causes of distortion and methods for control
- Can identify and check the external features of the weld
- Knows the positions of welding

- Knows the type of product to be fabricated
- Understands the effects of welding on the material of construction of the product
- Knows the types of defects that may occur and their avoidance
- Knows the principal types of welded joints and their features
- Can apply the specific Welding Procedure Specification
- Understands the significance of weld quality
- Understands the role of welder qualification tests
- Knows how weld quality is checked
- Understands the dangers of faulty welds and the consequences of failure

3.4 Independent Examiner

The Examiner shall be independent of the client and training organisation and shall be appointed by the certifying authority, see Section 6.

4 ADEQUATE TRAINING

This Code of Practice has been submitted to the Health and Safety Executive as the benchmark for Welding Operative training which meets the minimum requirements for 'adequate training' given in the *WORK EQUIPMENT REGULATIONS*.

5 REQUIREMENTS FOR TRAINING ORGANISATIONS

5.1 Authorisation Procedure

Training organisations wishing to follow the NWTS requirements at Welding Operator level must first apply using *Self Assessment Form*. This seeks the information necessary to provide assurance that the organisation has the competencies needed to deliver the training, examinations and tests leading to certification as a Welding Operative.

Successful applicants will be granted provisional status as a Recognised Training Provider. Within 12 months the Provider must seek full Authorised status by an audit.

Training Providers already approved under the Certification Scheme for Welder Training Organisations will be deemed to meet all the requirements of the Standard. Furthermore, those Providers holding current accreditation for welder training through recognised Awarding Bodies or Inspectorates shall be deemed to satisfy the general purposes of the Standard. They must also satisfy the welding specific requirements for welding instructors, lecturers and quality management of the Code and if so, they will be deemed to meet all the requirements of CP1. *In both cases immediate Authorised Training Provider status may be offered without further audit.*

5.2 Equipment and Premises

The training organisation shall have adequate welding and related equipment for the scope of training offered. It shall be fit for purpose, safe, calibrated (welding parameters), and correctly maintained.

Where qualification testing is carried out in-house, the relevant equipment shall be available and correctly maintained and those involved in test piece assessment shall be appropriately qualified.

Practical training shall be carried out in appropriate premises with good standards of illumination and welding operations shall be correctly screened. Work equipment such as benches, vices, hand tools and power/air tools shall be provided. A room for lectures providing a suitable environment for information transfer shall be available.

There shall be adequate arrangements for changing and storing clothes, safe keeping of valuables, and provision of simple refreshments and toilet/washroom facilities.

Note: *the above requirements apply equally to training undertaken away from the training establishment, e.g. at client's premises*

Safe working is a key issue and all practical activities shall be subject to up to date risk assessments. All trainees shall be properly supervised and wear the correct personal protective equipment. Adequate general ventilation and local fume extraction shall be in place. The guideline for safe working is 'Health and Safety in Welding and Allied Processes'*. Arrangements for first aid and emergency action in case of accident shall be in place.

5.3 Qualification of instructors and lecturers

Those engaged in the practical training of Welding Operatives shall:

- i) Have proven practical skills in welding at least to the level for which training is offered, covering:

- Specific processes
- Specific materials
- Specific forms
- All positions

And ii) Hold an NWTS recognised welding qualification at Level 2 or above

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Or iii) Be qualified as CSWIP Registered Master Welding Instructors or Specialist Welding Instructors

Those providing theoretical instruction shall be appropriately qualified, the benchmark being a recognised Level 3 welding qualification.

5.4 Quality Management

Training activities shall be correctly management and controlled through the application of a simple Quality Manual covering:

5.4.1 Training Records

Records to be held of trainee information:

Name/permanent address/telephone/email
Address for certificate if different from above
Sex
Country of origin
Nationality
Date of Birth
National Insurance Number
Qualifications
Employer; current/prospective/unemployed
Relevant experience
Programme Reference No.
Test piece Reference No.
Results Notification Reference No. ; date
Certificate No. ; date

5.4.2 Training Outcomes

The following information shall be recorded for each trainee using the standard *NWTS Result Notification Form*:

Relevant training data
Qualification test performance: Pass/Fail
(If result is Fail, the reasons are to be given)
Examination: Pass/Fail
(If result is Fail, the areas in which the candidate failed to demonstrate adequate knowledge are to be indicated)
Overall outcome: Pass/Fail

Copies of the form are supplied to the employer and trainee. A further copy is filed centrally.

5.4.3 Certification

NWTS Certificates are issued only by the certifying authority (see Section 6) and each carries a unique pre-printed serial number.

5.4.4 Training programmes

NWTS based programmes shall be specified in writing to employers and trainees. Each shall carry a unique reference number and be held on file for three years.

5.4.5 Weld quality requirements

The weld quality to be achieved by each trainee shall be agreed with the employer or sponsor, or specified by the Training Provider, and recorded.

The qualification testing regime is similarly agreed/specified, and copied to employer and trainee, and recorded.

Copies are held on file for five years.

5.4.6 Identification of test pieces and specimens

Each qualification test piece is identified by a unique reference which is stamped on each test piece and test specimen. The numbers are recorded on the trainee's record.

5.4.7 Welding procedure specification/instructions

All practical welding training and welding of qualification test pieces shall be covered by written WPS or instructions identified by a reference system. Copies are held on file for a minimum of five years.

5.4.8 Welding equipment

The welding equipment used for training and qualification testing is clearly identified. It is listed on a schedule, which implies it is fit for purpose, and dates of maintenance and calibration are recorded. Year of manufacture and purchase are also recorded.

5.4.9 Materials and consumables

All materials and consumables used for training and qualification shall be clearly identified to ensure that only the correct types are used. The identification system is clearly specified and recorded. Materials and consumables must be stored in accordance with manufacturers' recommendations and subject to controlled issue.

5.4.10 Related equipment

A schedule shall record related equipment used for the production of weld preparations, cleaning, positioning, clamping and other

welding related functions. Entry on the schedule implies that it is fit for purpose and correctly maintained.

5.4.11 Testing equipment and personnel

If testing of welded specimens is carried out in house, a schedule records the equipment available and the qualification of those who will operate it and interpret the results.

If testing is carried out externally, details of the arrangements, facilities and personnel are recorded.

5.4.12 Staff training

Staff are to be given opportunities to update their knowledge and skills, and to maintain current certifications. These activities are to be recorded and entered in the individual's log book.

5.4.13 Annual surveillance

The Training Provider shall conduct an internal annual surveillance audit and record the results.

6. SCHEME MANAGEMENT

The NWTS scheme documentation, criteria, etc, are the responsibility of AWFTE. Implementation of the scheme is the responsibility of TWI Certification Ltd, an independent body, accredited by UKAS for the certification of personnel.

6.1 NWTS Documentation and Criteria

The AWFTE Management Committee shall:

- Review and approve all scheme documentation.
- Review proposed amendments to the Codes of Practice in the light of operating experience.
- Review proposals for new requirements as perceived necessary.
- Report to the Membership, Education and Registration Committee of The Welding Institute.

6.2 Implementation

The Certification Management Board of TWI Certification Ltd will be responsible for:

- Evaluation and assessment of Training Providers
- Recognition/Authorisation of Training Providers

- Appointment of the NWTS Scheme Assessor and Independent Examiners
- Issue of NWTS certificates
- Maintaining records of all the above.

The NWTS Scheme Assessor's role is:

- To review applications from Training Providers and to recommend grant of Recognised or Authorised status, or no current award.
- To arrange audits of Training Providers as required, to review the results and make appropriate recommendations.
- To maintain a list of Independent Examiners and to arrange appropriate training to achieve uniformity in the conduct of their activities.

7. ADDRESSES

7.1 NWTS Documentation and Criteria

All correspondence should be addressed to:

AWFTE Secretariat
 The Welding Institute, Professional Division
 Granta Park
 Great Abington
 Cambridge CB1 6AL

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7.2 Implementation

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