

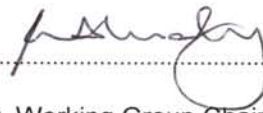
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Date:	04 December 2010
Compliance date:	04 June 2011

Level 2

Competence and Training in Track Welding, Weld Inspection and Ancillary Processes

Endorsement and Authorisation

Endorsed by:



B Mosley, Working Group Chair

Authorised by:



M Ruddy, Steering Group Chair

Accepted for issue by:



M McManus, National Standards Manager

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Published and Issued by Network Rail, Kings Place, 90 York Way, London. N1 9AG.

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Compliance date:	04 June 2011

Issue record

Issue	Date	Comments
1	Dec 2010	First issue

Compliance

This Network Rail standard is mandatory and shall be complied with by Network Rail and its contractors if applicable from 04 June 2011.

When this standard is implemented, it is permissible for all projects that have formally completed GRIP Stage 4 to continue to comply with the Issue of any relevant Network Rail Standards current when GRIP Stage 4 was reached and not to comply with requirements contained herein, unless the designated Standard Owner has stipulated otherwise in the accompanying Briefing Note.

Reference documentation

NR/L2/CTM/021	Competence and Training in Track Safety
NR/L2/CTM/202	Quality Assurance in Training and Assessment
NR/L2/TRK/1110	Qualification and Certification of NDT Personnel Written Practice – Ultrasonic Testing
NR/L2/OHS/00124	Competence specific medical fitness requirements
NR/L1/OHS/051	Drugs and Alcohol

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1 Purpose.

This standard sets out the minimum requirements for the training and competence assessment of individuals who undertake track welding activities on Network Rail managed infrastructure. It defines processes to be implemented and the standards to be achieved to confirm that individuals who undertake track welding activities are competent to do so.

2 Scope.

This standard applies to any individual who undertakes track welding, weld inspection and/or any ancillary processes on Network Rail managed infrastructure.

This standard covers the following activities and processes:

- a) aluminothermic processes:
 - Thermit;
 - Railtech.
- b) maintenance arc welding:
 - manual metal arc welding;
 - flux cored arc welding;
 - fully automatic welding.
- c) ancillary processes:
 - weld inspection;
 - oxy fuel gas cutting;
 - examination of oxy fuel gas equipment.

3 Definitions.

Aluminothermic welding.

A process, by which two rails are permanently butt-welded together by the introduction of cast metal .

Approved assessor.

An individual approved by Network Rail or its approving organisation who uses Network Rail competence standards and/or assessment materials to provide assessment services to third parties and/or complete assessments that are recorded on the scheme operator database as part of the Sentinel scheme.

Approved training centre.

A training centre or facility that has demonstrated that it:

- has all the tools, equipment and facilities necessary to deliver specified training events; **and**
- is approved by Network Rail or its approving organisation to deliver specified training event(s).

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Arc welding.

A process by which the weld is made between surfaces brought to the molten state using an electric arc as the heat source, with or without the use of a filler metal and without the application of pressure.

Assessment.

A systematic process of gathering and judging evidence to 'prove' or 'determine' an individual's competence as defined in a competence standard. Assessment includes the re-assessment of an individual's competence.

A measurement process of the learning that has either taken place or can take place usually measured against stated learning outcomes.

Assistant Welder.

An individual who has been trained and tested and who is currently certificated to assist a Welder in carrying out defined welding processes and procedures.

Authority to Work.

A document that details the work activities that an individual is authorised to undertake. It includes the details of a person's competence and details of any restrictions that apply to the way the person works e.g. requirement for supervision.

Certificate.

A document that confirms that specific competence has been demonstrated by an individual against the requirements of a competence standard.

In the context of this standard means a Welding Sentinel Card.

Competence.

Ability to perform a particular activity to a prescribed standard. The activity can involve the development of a variety of skills.

The ability to undertake responsibilities and to perform activities to a recognised standard on a regular basis. A combination of practical thinking skills, experience and knowledge and may include a willingness to undertake work activities in accordance with agreed standards, rules and procedures. It can also include the consistent achievement of an identified standard of performance under defined normal, abnormal, and emergency situations; the ability to undertake work to confirm the safety of any person who might be affected by the work; and an appropriate level of physical fitness.

Competence Management System (CMS).

A suitably resourced, logical and integrated cycle of activities within an organisation used to assure competence of those who can, through lack of competence, have an impact on the:

- safe operation and maintenance of Network Rail managed infrastructure;
- occupational health and safety of workers on or about Network Rail managed infrastructure;
- safety of other persons affected by their actions or inactions;

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d) performance of Network Rail's business.

Competence standard.

A statement of:

- what an individual is to be able to do and how well, in order to achieve the intended outcome of work;
- the range of circumstances in which the ability would have to be demonstrated;
- the knowledge required to complete the work;
- the types of evidence needed to confirm that performance is consistent and can be sustained;
- how this would be assessed.

Experienced Welder.

A qualified welder who has completed their first recertification cycle.

IMDM.

Infrastructure Maintenance Delivery Manager.

Mentoring period.

A period of time between the satisfactory completion of training where an individual undertakes the work under supervision of a mentor. This period is used to enable the individual to practice the activity, acquire the associated knowledge and collate the relevant evidence ready for assessment.

Safety Critical Work.

Work activities carried out in the railway industry that can affect the health and safety of persons on the transport system and that can have a real time impact on the operational railway.

Trainee Welder.

An individual who has been trained and tested and who is currently certificated to carry out defined welding processes and procedures during a defined period of mentorship.

Approved Trainer.

An individual who gives knowledge or information to learners in a systematic manner by presenting information, directing structured learning experiences, and managing/facilitating group discussions and activities.

An individual who is approved by Network Rail or its approving organisation to deliver one or more named training events and is involved in the activity of delivering targeted learning to an audience.

Verification.

A process by which the quality of assessment decisions and the supporting process are independently assured.

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Verifier.

An individual who is competent and authorised to review the assessment process and confirm assessment decisions.

Welding Engineer.

An individual with comprehensive technical knowledge in welding and allied processes relevant to track welding, which shall be attained by a combination of theoretical knowledge, training and/or experience.

Welding Inspector.

An individual trained, qualified and approved to carry out inspection of welds by observation and judgement, accompanied as appropriate by measurement and testing.

Welding Manager.

An individual with specific technical knowledge, where the level of technical knowledge needs to be sufficient for the planning, executing, supervising and testing of the tasks and responsibilities relevant to track welding.

Welder.

An individual who has been trained and tested and who is currently certificated to carry out defined welding processes and procedures.

Welded joint (weld or butt weld).

A union between two pieces of rail, with or without, the use of a filler metal. It is a joint in the rail without fishplates, bolting or clamping, to provide a continuous, uninterrupted running surface (e.g. aluminothermic, flash-butt or gas pressure weld).

4 Requirements.

4.1 Deployment.

Individuals shall not be deployed to carry out track welding activities on Network Rail managed infrastructure, unless that individual has been trained and assessed as competent against the requirements of this standard at an approved training centre and is in possession of current certification permitting them to undertake track welding.

4.2 Work on or near the line.

Where an individual is required to work on or near the line they shall hold the relevant Track Safety competence(s) as described in NR/L2/CTM/021: Competence and Training in Track Safety.

4.3 Medical fitness.

Any individual required to undertake welding activities shall be able to demonstrate medical fitness in accordance with:

- NR/L2/OHS/00124: Competence specific medical fitness requirements
- NR/L1/OHS/051: Drugs and Alcohol

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In addition, individuals shall be able to demonstrate the vision requirements as described in:

- NR/L2/TRK/1110 - Qualification and Certification of NDT Personnel Written Practice – Ultrasonic Testing

4.4 Minimum age.

Any individual holding any welding certification shall be at least 18 years of age.

4.5 Requirements for all Welding competence.

Individuals shall meet the requirements of **4.1 - 4.4** inclusive prior to being selected for welder training.

5 Training.

Subject to the minimum requirements in **4.1 - 4.5**, employers shall have systems in place to identify specific training needs for each person in scope. Employers shall use this information to determine what training is appropriate for each person in scope.

The following steps shall be used and documented to identify and satisfy specific training needs:

- identify deployment requirements for the individual concerned;
- take account of specific types of asset that the individual is required to work on and the type of activities the individual is required to undertake;
- establish the current competence of the individual in relation to deployment requirements;
- establish what development is required and therefore which training modules are appropriate to match the deployment needs;
- agree a development plan with the individual and the order in which the training should take place;
- arrange training;
- individual completes relevant training.

A training framework and specific training modules have been developed to address the common training needs. These modules are summarised in Appendix A.

6 Mentoring.

Following the successful completion of training, each individual may be subject to a period of workplace experience . Where applicable the detailed mentoring requirements shall be provided in each training event. Employers shall appoint a mentor who shall be responsible for supporting the workplace experience. Employers shall demonstrate that appropriate supervision is maintained during the period of mentoring.

Network Rail or each contracting employer shall provide a mechanism to their employees to enable them to record work experience including activities the individual has completed during the workplace experience.

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7 Assessment.

Following successful completion of the relevant training and/or mentoring the individual shall be assessed against the requirements of the relevant competence unit contained in this standard.

This assessment shall only be carried out when the line manager/supervisor is satisfied that the candidate has gained sufficient weld experience to complete the weld activities to the required standard.

8 Certification.

8.1 Issue of certification.

Certification for all Sentinel-related competencies shall have a maximum validity as shown in the table below.

Competence	Validity	Interim Assessment due
Assistant Welder	None ^a	None ^a
MMA1-7; FCAW1-4	2 years	9-15 months
FCAW6 and 6a	None ^b	None ^b
TW1-5, RT1-5	2 years	9-15 months
WI1-3	5 years	12, 24, 36 and 48 months
^a Assistant Welders shall complete an oxy-fuel gas safety paper and in addition, shall have their powered plant competencies re-assessed every 2 years.		
^b Valid whilst FCAW1 is maintained.		

Where an assessment is completed less than 8 weeks before the expiry date of an existing certificate it is permitted to use that expiry date as the starting point of the new record.

Upon completion of training, training providers shall register the results with the NCCA.

8.2 Withdrawal of certification.

Certification shall be withdrawn or suspended if:

- the conduct of the holder gives cause to suspect lack of competence when on or near the line;
- the holder is unable to meet medical fitness requirements in line with the specific competence;
- the holder is suspected to have caused or contributed to an incident, or accident;
- the holder makes decisions or takes actions that result in a major breach of safety or endangers the safety of others.
- the competence has not been used within the specified minimum period.

Competence shall only be restored when competence or medical assessment has shown that the individual concerned complies with the requirements of this specification.

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NOTE: Restoration of competence may include the requirement for the individual to attend initial, or recertification events, undergo an assessment or pass a suitable medical assessment as required.

8.3 Transferability of certification.

Where an individual is sponsored by more than one Sentinel authorised site or where an individual transfers between sponsoring organisations, the competence held by that individual is transferable between sponsors. However, proof of prior experience shall be provided by the individual as a guide to the level of competence held. As a minimum this shall include the experience recorded in the work experience records, their Track Welding Sentinel card and the successful completion of a Track Welding Assessment.

Where proof of prior competence cannot be proven, reassessment of competence at a Network Rail approved training centre shall be carried out prior to commencement of employment. This requirement does not apply to Welders and Assistant/Trainee welders transferred under the TUPE arrangements.

9 Route to competence.

Welder certification is split into 4 roles:

- Assistant Welder
- Trainee Welder (probationary competence (P))
- Welder
- Weld Inspector

Training for each of these roles is split into welding process training events. These events are summarised in Appendix A.

Upon successful completion of training, certification shall be issued in line with the competence requirements.

Where applicable, a period of work place experience shall be required, the details of these requirements are described in the specific unit of competence in Appendix B and in the flowcharts in Appendix C.

In cases where mentoring is required, full competence shall be subject to the successful completion of a workplace assessment.

On successful completion of training and return to the workplace, welders shall be issued with a unique 'stamp' number. This number is to be used on all welds they complete. When a welder has completed a weld they shall stamp the weld with their unique 'stamp' number

Where applicable interim assessments shall be completed between 9 and 15 months to confirm continued competence, where continued competence cannot be proven the candidate shall be dealt with as described in **16.1**.

For all welding competence except Assistant Welder and Weld Inspection, 'Out of track' assessments shall be completed at 24 month intervals to confirm continued competence, where continued competence cannot be proven the candidate shall be dealt with as described in **16.1**.

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For Weld Inspection competence, 'Out of track' assessments shall be completed at 60 month intervals to confirm continued competence, where continued competence can not be proven the candidate shall be dealt with as described in **16.1**.

There is no 'out of track' assessment requirement for assistant welders.

Records of work experience shall be maintained for all Welding competence. The details of the requirements are described in the relevant unit of competence in Appendix B.

All results of training and assessment shall be record as a minimum and as appropriate on the NCCA website.

10 Delivery of training.

10.1 Trainers.

Any individual delivering the training shall be approved by Network Rail in accordance with the requirements of NR/L2/CTM/202: Quality Assurance in Training and Assessment.

Where available, trainers shall use Network Rail approved training plans and assessments to deliver the training event.

10.2 Training facilities and equipment.

Training facilities and equipment shall meet the minimum specification as agreed with Network Rail. Only training centres approved by Network Rail or it's approving organisation shall be authorised to train welding events.

11 Completion of assessment.

Assessors shall be approved in accordance with the Network Rail standard NR/L2/CTM/202: Quality Assurance in Training and Assessment, prior to undertaking assessments against the competence units detailed in Appendix B. Assessors shall plan and complete assessments.

12 Verification.

Employers shall have in place verification procedures to confirm that at a minimum of 10% of completed assessments are verified.

13 Maintaining competence.

Competence of an individual shall be maintained in accordance with section **16.3**.

14 Work experience records.

The use of work experience records is mandatory for all Welding Competence. Specific details to be recorded are detailed in Appendix B. The line manager shall be responsible for reviewing the work experience records at regular intervals to confirm that the competence is being maintained.

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15 Application.

15.1 Competence units.

Competence units have been developed which shall be suitable to control the risks associated with incompetent performance of individuals who undertake track welding, weld inspection or ancillary processes. These competence units are detailed in Appendix B.

16 Assessment strategy.

16.1 General.

The strategy to be applied to assessment takes account of a number of factors:

- whether or not the individual is new to the job role;
- what training and experience the individual has had;
- what different types of processes the individual is required to carry out;
- the practicality of gathering observed evidence;
- the risks from incompetent performance.

16.2 Initial assessment.

The following approach shall be used:

Case 1.

Where the activity is new to the individuals area of responsibility they shall:

- attend the relevant training and complete end of training assessments;
- complete a period of work experience under supervision where applicable, against objectives set at the end of the training, and record the details. During the mentoring period the mentor shall demonstrate that both their own safety and the safety of others are maintained at all times in accordance with current legislation;
- be assessed against the requirements laid down in the relevant competence unit by the Welding Engineer or their nominated representative.

If the individual is competent the person completing the assessment shall issue a certificate of competence.

If the individual is not yet competent:

- the line manager shall agree and implement a development action plan;
- the individual is able to continue workplace experience under supervision for a further period not exceeding six months;
- on completion of the development action plan the individual shall be re-assessed for the specific competence.

Case 2.

Where the individual has been previously trained and has had their mentoring period extended by a further period of six months, they shall be assessed for the specific competence using the following as the primary source of evidence:

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- detailed questioning/standard knowledge tests;
- performance reports from the line manager to confirm satisfactory and safe performance across the range of work detailed in the competence unit.

If the individual is competent the person completing the assessment shall issue a certificate of competence.

However, if the individual is not yet or no longer competent they shall be dealt with as described in **Case 1**.

Network Rail approved training and assessment materials shall be used to determine the individuals competence level.

16.3 Maintaining competence.

Employers shall have systems in place to assure the continued competence of individuals undertaking track welding, weld inspection or ancillary processes. These systems shall consist as a minimum of:

- a) a record of work experience which can be in the form of the following:
 - copies of work records;
 - installation records;
 - work experience form entries.
- b) the implementation of a re-assessment regime shall confirm that:
 - the work completed by the individual meets the requirements of the performance statements in the relevant competence unit;
 - the individual has the knowledge defined in the relevant competence unit;
 - there have been no incidents, accidents or near misses as a result of the individuals completing the work.
- c) the implementation of a process in accordance with the site specific safety management system that confirms that the individual has the knowledge necessary to continue undertaking welding activities.

Where continued competence cannot be confirmed through the review/re-assessment, arrangements shall be made for the competence to be withdrawn.

The responsible manager shall develop a plan to restore the individual's competence, dependent upon business needs, which may include retraining and/or further mentoring and re-assessment.

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Appendix A Training Framework Summary.

A.1 Training events.

Where an individual requires training to develop their competence they shall attend and successfully complete the Network Rail approved training events. This Appendix contains a brief overview of the modules that form the Track welding training framework.

A.1.1 Assistant welder.

The assistant welder training is the foundation for aluminothermic welding and provides the necessary health and safety training, welding theory and practice and plant competencies. This training is designed to make delegates aware of the roles and responsibilities of an assistant welder to enable them to assist an aluminothermic welder in the production of aluminothermic welds to the standard required.

Assistant welder is a pre-requisite of all other aluminothermic welding training. To prove competence as an Assistant Welder, delegates shall successfully complete a Network Rail approved training event.

A.1.2 Trainee welder.

To qualify as a trainee welder, delegates shall have completed the assistant welder training, shall have met the progression requirements, and successfully completed a Network Rail approved, process-specific, training event.

The Network Rail process specific training events include:

- | | |
|-------------------|-----------------------|
| • RT1: Railtech 1 | • TW1: Thermit Weld 1 |
| • RT2: Railtech 2 | • TW2: Thermit Weld 2 |
| • RT3: Railtech 3 | • TW3: Thermit Weld 3 |

Upon successful completion of the training and on return to the work place the trainee welder shall be issued with a unique 'stamp' number to be used on completed welds. This shall be used during the mentoring period and assists in identifying the number of completed welds the trainee welder has installed.

RT1 - PLA felt mould system:

This training is designed to make delegates aware of the roles and responsibilities associated with PLA felt mould systems, rail profiles, grades, rail wear combinations and preheating fuel gases and to give them the knowledge and skills necessary to produce RT1 welds on the railway infrastructure.

RT2 - PLA felt and sand mould systems:

This training is designed to make delegates aware of the roles and responsibilities associated with PLA felt and sand mould systems, rail profiles, grades, rail wear combinations and preheating fuel gases and to give them the knowledge and skills necessary to produce RT2 welds on the railway infrastructure.

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RT3 - PLA felt, sand mould systems and gap 68 wide gap welds:

This training is designed to make delegates aware of the roles and responsibilities associated with PLA felt and sand mould systems and gap 68 wide gap welds, rail profiles, grades, rail wear combinations and preheating fuel gases and to give them the knowledge and skills necessary to produce RT3 welds on the railway infrastructure.

TW1 - SkV-E & F Process; New and similar worn rail sections:

This training is designed to make delegates aware of the roles and responsibilities associated with SkV-E & F processes, all rail profiles and grades, new and similar worn rail sections - oxy-propane / oxy-acetylene pre-heating and to give them the knowledge and skills necessary to produce TW1 welds on the railway infrastructure.

TW2 - SkV-E & F Process; New, similar and dissimilar worn rail sections:

This training is designed to make delegates aware of the roles and responsibilities associated with SkV-E & F processes, all rail profiles and grades, new, similar and dissimilar worn rail sections - oxy-propane / oxy-acetylene pre-heating and to give them the knowledge and skills necessary to produce TW2 welds on the railway infrastructure.

TW3 - SkV-L80 Wide Gap Process; All rail profiles, grades and rail wear combinations:

This training is designed to make delegates aware of the roles and responsibilities associated with SkV-L80 wide gap processes, all rail profiles and grades and rail wear combinations and oxy-propane pre-heating only and to give them the knowledge and skills necessary to produce TW3 welds on the railway infrastructure.

A.1.3 Aluminothermic welder.

To qualify as an aluminothermic welder, delegates shall have completed the assistant training and met the requirements of the trainee welding including successful completion of all post mentoring assessments.

For delegates that require additional aluminothermic competence the additional training modules apply.

TW4 - SkV-L80 Composite Wide Gap Process; All rail profiles, grades and rail wear combinations:

This training is designed to make delegates aware of the roles and responsibilities associated with SkV-L80 composite wide gap processes, all rail profiles and grades and rail wear combinations and oxy-propane pre-heating only and to give them the knowledge and skills necessary to produce TW4 welds on the railway infrastructure.

TW5 - Special processes; Slab Track, SoWoS and Head Repair:

This training is designed to make delegates aware of the roles and responsibilities associated with the aluminothermic special processes relating to slab track, SoWoS, and head repair and to give them the knowledge and skills necessary to produce TW5(a), TW5(b) and TW5(c) welds on the railway infrastructure.

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RT4 - PLA felt, sand mould systems, wide gap composite process:

This training is designed to make delegates aware of the roles and responsibilities associated with PLA felt mould systems and wide gap composite processes, all rail profiles and grades and rail wear combinations and to give them the knowledge and skills necessary to produce RT4 welds on the railway infrastructure.

RT5 - Head Wash Repair:

This training is designed to make delegates aware of the roles and responsibilities associated with the Railtech Head Wash Repair process, and to give them the knowledge and skills necessary to produce RT5 welds on the railway infrastructure.

A.1.4 Arc welder.

To qualify as an arc welder, delegates shall have completed the relevant arc welding training.

For candidates that require manual metal-arc (MMA) and/or flux-cored arc welding (FCAW) competence the following training shall apply.

MMA1 - MMA repairs to plain rail, all rail grade groups and welding for track circuiting purposes:

MMA1 is the foundation training for MMA welding and provides the necessary health and safety training, arc welding theory and practice and plant competencies. This training is designed to make delegates aware of the roles and responsibilities associated with MMA welding and to give them the knowledge and skills necessary to produce MMA1 welds on the railway infrastructure using appropriate techniques in a range of circumstances in line with current industry standards. MMA1 training event is a pre-requisite for all other MMA welding courses.

MMA2 - Resurfacing of crossings, normal grade rail groups:

This training is designed to make delegates aware of the roles and responsibilities associated with MMA resurfacing of normal grade crossings and to give them the knowledge and skills necessary to produce MMA2 welds on the railway infrastructure in line with current industry standards.

MMA3 - Resurfacing of crossings, austenitic manganese steel:

This training is designed to make delegates aware of the roles and responsibilities associated with MMA resurfacing of austenitic manganese steel crossings and to give them the knowledge and skills necessary to produce MMA3 welds on the railway infrastructure in line with current industry standards.

MMA4 - Repair of crossings, all rail grade groups:

This training is designed to make delegates aware of the roles and responsibilities associated with MMA repair of crossings, all grade rail groups and to give them the knowledge and skills necessary to produce MMA4 welds on the railway infrastructure in line with current industry standards.

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MMA5 - Switchblade welding:

This training is designed to make delegates aware of the roles and responsibilities associated with MMA welding repairs to switchblades on all permissible grade rail groups and to give them the knowledge and skills necessary to produce MMA5 welds on the railway infrastructure.

MMA7 - Joining of conductor rail (conversion):

This training is designed for delegates who already hold MMA welding competence and who require to undertake welding activities on conductor rail. This training is designed to make delegates aware of the roles and responsibilities associated with MMA welding of conductor rail and to give them the knowledge and skills necessary to produce MMA7 welds on the railway infrastructure.

MMA7a - Joining of conductor rail (full course):

This training is designed for delegates who do not hold any MMA welding competence and who require to undertake welding activities on conductor rail. This training is designed to make delegates aware of the roles and responsibilities associated with MMA welding of conductor rail and to give them the knowledge and skills necessary to produce MMA7 welds on the railway infrastructure.

FCAW1 - Repairs and resurfacing of plain rail, all rail grade groups and welding for track circuiting purposes:

FCAW1 is the foundation training for FCAW and provides the necessary health and safety training, arc welding theory and practice and plant competencies. This training event is designed to make delegates aware of the roles and responsibilities associated with FCAW and to give them the knowledge and skills necessary to produce FCAW1 welds on the railway infrastructure using appropriate techniques in a range of circumstances in line with current industry standards. FCAW1 training event is a pre-requisite for all other FCAW training.

FCAW2 - Crossing welding:

This training is designed to make delegates aware of the roles and responsibilities associated with FCAW repairs to crossings on all permissible grade rail groups and to give them the knowledge and skills necessary to produce FCAW2 welds on the railway infrastructure.

FCAW3 - Switchblade welding:

This training is designed to make delegates aware of the roles and responsibilities associated with FCAW repairs to switchblades on all permissible grade rail groups and to give them the knowledge and skills necessary to produce FCAW3 welds on the railway infrastructure.

FCAW4 - Joining of conductor rail (conversion):

This training is designed for delegates who already hold FCAW competence and who require to undertake welding activities on conductor rail. This training is designed to make delegates aware of the roles and responsibilities associated with flux cored arc welding of conductor rail on the Railway Infrastructure and to give them the knowledge and skills necessary to produce FCAW 4 welds on the railway infrastructure.

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FCAW4a - Joining of conductor rail (full course):

This training is designed for delegates who do not hold any FCAW competence and who require to undertake welding activities on conductor rail. This training is designed to make delegates aware of the roles and responsibilities associated with FCAW of conductor rail on the Railway Infrastructure and to give them the knowledge and skills necessary to produce FCAW4 welds on the railway infrastructure.

FCAW6 - Repairs to Plain Line and Crossing Components using Fully-Automatic Equipment:

This training is designed to make delegates aware of the roles and responsibilities associated with FCAW repairs to plain line and crossing components using ESAB BV1000 equipment on all permissible grade rail groups and to give them the knowledge and skills necessary to produce FCAW 6 welds on the railway infrastructure.

FCAW6a - Repairs to Switch Components using Fully-Automatic Equipment:

This training is designed to make delegates aware of the roles and responsibilities associated with FCAW repairs to switchblades using ESAB BV1000 equipment on all permissible grade rail groups and to give them the knowledge and skills necessary to produce FCAW6a welds on the railway infrastructure.

A.1.5 Weld Inspector.

To qualify as a Weld Inspector, WI1, delegates shall have at least 2 years demonstrable experience in aluminothermic welding, competence in magnetic particle testing (MPT), liquid penetrant testing (LPT) and shall have successfully completed the appropriate Network Rail approved training for weld inspection including any post mentoring requirements following training.

To qualify as a Weld Inspector, WI2, delegates shall hold WI1 competence, have experience of arc welding and shall have successfully completed the appropriate Network Rail approved training for weld inspection including any post mentoring requirements following training.

To qualify as a Weld Inspector, WI3, delegates shall hold WI1 competence and shall have successfully completed the appropriate Network Rail approved training for weld inspection including any post mentoring requirements following training.

WI1 - Weld Inspection; aluminothermic welding:

This training is designed to make delegates aware of the roles and responsibilities associated with aluminothermic weld inspection and to give them the knowledge and skills necessary to enable them to classify aluminothermic welds on the railway infrastructure.

WI2 - Weld Inspection; arc welding:

This training is designed to make delegates aware of the roles and responsibilities associated with arc weld inspection and to give them the knowledge and skills necessary to enable them to classify arc welds on the railway infrastructure.

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WI3 - Weld Inspection; flash butt welding:

This training is designed to make delegates aware of the roles and responsibilities associated with flash butt weld inspection and to give them the knowledge and skills necessary to enable them to classify flash butt welds on the railway infrastructure.

A.1.6 Ancillary Processes.

For candidates that require additional skills with a specific job or role to use or inspect oxy-fuel gas equipment.

Weld 102 - Oxy-fuel Gas Cutting:

This training is designed to make delegates aware of the roles and responsibilities associated with scrap cutting of rails using propane and acetylene, and to give them the knowledge and skills necessary to use oxy-fuel gas equipment in all permanent way applications using appropriate techniques.

Weld 104 - Inspection of Oxy-fuel Gas Equipment:

This training is designed to make delegates aware of the roles and responsibilities associated with the safe and efficient inspection and testing of oxy-fuel gas equipment and to give them the knowledge and skills necessary to enable them to test components and record information in line with current industry standards.

A.2 Course to Competence Links.

The following table details the course to competence links:

A.2.1 Aluminothermic framework.

Competence Ref	Competence Name	Training Ref	Training Modules
Asst Weld	Assistant welder - assist an aluminothermic welder in the production of aluminothermic welds to the standard required.	Assistant Welder	Assistant/Trainee Welder PLA & SkV
TW1	SkV-E & F process - all rail profiles/grades - new/similar worn rail - oxy-propane/acetylene preheating	TW1	Aluminothermic Welder TW1-3
TW2	SkV-E & F process - all rail profiles/grades - new/similar dissimilar worn rail - oxy-propane/acetylene preheating	TW2	Aluminothermic Welder TW1-3
TW3	SkV-L80 wide gap process - all rail profiles/grades rail wear combinations - oxy-propane preheat	TW3	Aluminothermic Welder TW1-3
TW4	SkV-L80 composite wide gap process - all rail profiles/grades rail wear combinations - oxy-propane preheat	TW4	Aluminothermic Welder TW4
TW5(a)	Special processes - Slab Track	TW5(a)	Aluminothermic Welder TW5(a) Slab track
TW5(b)	Special processes - SoWoS	TW5(b)	Aluminothermic Welder TW5(b) SoWoS
TW5(c)	Special processes - Head Repair	TW5(c)	Aluminothermic Welder TW5(c) Thermit Head Repair
RT1	PLA felt mould system, rail profiles, grades, rail wear combinations and preheating fuel gases	RT1	Aluminothermic Welder RT1-3

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RT2	PLA felt, sand mould system, rail profiles, grades, rail wear combinations and preheating fuel gases	RT2	Aluminothermic Welder RT1-3
RT3	PLA felt, sand mould systems & gap 68 wide gap welds, rail profiles, grades, rail wear combinations	RT3	Aluminothermic Welder RT1-3
RT4	PLA wide gap composite process - all rail profiles/grades - rail wear combinations	RT4	Aluminothermic Welder RT4
RT5	Head Wash Repair Process	RT5	Aluminothermic Welder RT5

A.2.2 MMA framework.

Competence Ref	Competence Name	Training Ref	Training Module
MMA1	Repairs to plain rail, all rail grade groups and welding for track circuit purposes	MMA1	Arc welder MMA1
MMA2	Resurfacing of crossings, normal rail grade groups	MMA2	Arc welder MMA2-4
MMA3	Resurfacing of crossings, austenitic-manganese rail	MMA3	Arc welder MMA2-4
MMA4	Repair of crossings - all rail groups	MMA4	Arc welder MMA2-4
MMA5	Repair of switch blades - all permissible rail groups	MMA5	Arc welder MMA5
MMA7	Joining of conductor rails	MMA7	Arc welder MMA7

A.2.3 FCAW Framework.

Competence Ref	Competence Name	Training Ref	Training Module
FCAW1	Repairs and resurfacing of plain rail, all rail grade groups and welding for track circuit purposes	FCAW1	Arc welder FCAW1
FCAW2	Repair of crossings, all rail grade groups	FCAW2	Arc welder FCAW2
FCAW3	Repair of switch blades, all permissible rail grade groups	FCAW3	Arc welder FCAW3
FCAW4	Joining of conductor rails	FCAW4	Arc welder FCAW4
FCAW6	Repairs to plain line and crossing components using fully automatic equipment	FCAW6	Arc welder FCAW6
FCAW6a	Repairs to switch components using fully automatic equipment	FCAW6a	Arc welder FCAW6a

A.2.4 Weld inspection framework.

Competence Ref	Competence Name	Training Ref	Training Module
WI1	Inspection of aluminothermic welds	WI 1	Aluminothermic Weld Inspection WI1
WI2	Inspection of arc welding	WI 2	Arc Welding Inspection WI2
WI3	Inspection of flash butt welds	WI 3	Flash butt Welding Inspection WI3