

## 1. Introduction

In June 2005 a rail study tour to Europe was coordinated by the WTIA in conjunction with the SMART Rail Industry Group. The delegates visited firms in the rail industry in England, France and Germany to compare international track engineering processes, equipment and training techniques with what is happening in Australia. This document outlines the current trend in Europe in regards to training, qualification and certification.

## 2. Training, qualification and certification

Rail track and rolling stock are high integrity structures and the consequence of failure is high. It has been recognised that significant regulation of welding and related activities is required. For track welding the need for personnel competence and control systems is even greater as rail steels are difficult to weld by conventional processes and the environment, particularly for site welding, is difficult to control.

On rolling stock fabrication items, particularly on items such as bogies, quality is critical and needs stringent control.

Requirements for the certification of welding training organisations, the certification of welding instructors and specialist welding instructors have been developed.

Requirements for rail welder training organisations seeking approval under the certification scheme for welder training organisations cover the following areas:

- Premises and facilities
- Training on clients sites
- Equipment
- Materials and consumables
- Personnel
- Control manual
- Competence (qualification) testing
- Training courses
- Safety

Training facilities need to include all the rail sizes and sections utilised in track, the different types of sleepers viz. timber, concrete and steel and the different types of rail fastenings used.

Audits of rail welder training centres are conducted and cover 3 main areas:

- Compliance with requirements
- Welding instructor assessments
- Technical content of the training

## 3. Certification of companies

In Germany, the manufacture of steel structures and railway vehicles is in a regulated sector. Manufacturers from anywhere in the world, wishing to sell such products into Germany require assessment and approval by an authorised body such as an SLV from Germany. Certification is carried out against the requirements of EN729/ISO 3834 Quality requirements for welding - Fusion welding of metallic materials.

ISO 3834 Part 2 'Comprehensive quality requirements' is the part of the standard generally used within the rail sector as rolling stock and associated components are considered as safety critical components.

DIN 6700: Welding of railways vehicles and parts (a very detailed standard) references the requirement for fabricators to have welding quality management systems in place and for certification of these companies to the requirements of ISO 3834.

In the UK the following training and certification schemes have been introduced for the rail industry:

- Training and certification schemes for rail welding inspectors.
- Certification criteria for rail welder training organisations and rail welding instructors
- Certification criteria for rail welding contractors based on EN 729/ISO 3834
- Training and qualification scheme for rail welding engineers.

#### **4. Rail welder training**

A collaborative European project titled RAILS SAFE which is part of the EU funded Leonardo da Vinci project on rail welder training and certification has the following main objectives:

- To have trained and certified railway track welders available to assure the quality and reliability of railway tracks.
- To harmonise education, qualification and certification to make exchange of welders in the European Union possible.
- To assure the quality of and access to continuing vocational education and certification for life-long competences and better employability of railway welders across national borders.

Discussions with the rail network operators in the UK, France and Germany who are all part of the project have already implemented standardised training for Aluminothermic and arc welders by utilising standardised training packages and a common approach to training of track welders.

Welders are given 50 days of training over a period following on from an initial 3 month period working on track with a track welding team to discover if the prospective trainee likes the type of work and would be suitable for training as a welder. The training covers the following areas:

- Flame cutting
- Aluminothermic welding
- Alignment and use of moulds and products
- Arc welding
- Track welding techniques
- Grinding of joints and particularly grinding of crossings
- Safety rules and track safety
- Visual Inspection

Germany has introduced a large number of training courses for the rail industry in a drive to up-skill the industry and ensures that suitably qualified welding coordination personnel are available to fulfill the requirements of ISO 14731 Welding coordination – Tasks and responsibilities.

These are:

- Welding engineer - Permanent way
- Welding specialist - Permanent way
- Track rail technology engineer - Supervisor
- Track rail technology foreman - Supervisor
- Permanent way welder training (practical)
- Flame cutter
- Aluminothermic joint welding of rails and switch components
- Build up welding - electrodes
- Build up welding - flux cored
- Joint welding - electrodes

- Joint welding - flux cored

The European Welding Federation (EWF) has been asked by the CEN committee on rail welding to establish a data base of qualified and certificated rail welders

## 5. Responsibility and accountability

Major emphasis has been put on welder training to ensure that the welder has the correct skill level and is competent to apply the relevant welding procedures. Welders are required to work to the quality procedure and are required to self inspect the welds performed by him/her and need to complete an inspection and quality control sheet for each weld certifying that they are sound. The welder is also required to stamp his identification at the weld including the date on which the weld was performed.

The welder is accountable for the welds he/she produces and every broken weld is examined as to the cause of failure and a welders permit may be withdrawn if it is shown that he/she did not follow procedure.

## 6. Australian rail industry

Currently some of the rail companies in Australia have in house training of aluminothermic welders and will issue a permit to weld. There is no national system for welder qualification or for standardised training around the country.

Lessons which can be learnt from the Europeans are:

- Standardised training and certification of rail track welders
- Certification of rail welder training organisations and rail welding instructors
- Certification of rail welding inspectors and supervisors
- Data base of qualified and certificated welders
- Certification of companies supplying welded product or services to the rail industry in accordance with ISO 3834 requirements

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As part of the WTIA National Diffusion Networks Project the Rail Industry Sector undertook a rail study mission to Europe to compare international track engineering processes, equipment and training techniques with what is happening in Australia. As a valued technology expert in this area we would like you to be part of the Technology Expert Group to review this note. Please complete this questionnaire so that we can gauge the success of meeting this need.

**Objective 1: Identify the need for training, qualification and certification.**

This document is aimed at providing some information on the current practices with respect to training and certification of personnel and companies in the rail industry in Europe as a prompt for improving the local rail industry in these areas. How well does the document achieve these aims?

poor  average  good  very good

Comments: \_\_\_\_\_

**Objective 2: Identify appropriate technology receptors.**

This document was written for Maintenance Engineers, Maintenance Contractors and Welding Coordinators in the Rail Industry. Are these people the appropriate individuals we should be targeting?

yes  no

What other types of companies and/or personnel do you suggest we target? \_\_\_\_\_

**Objective 3: Identify current best practice for training, qualification and certification.**

The document was written to reflect current best practice for training, qualification and certification in the rail industry. Do you envisage opportunities for the use of this practice in industry?

yes  no

If yes, what and where, if no why not? \_\_\_\_\_

**Objective 4: Is the information provided clear, concise and accurate?**

yes  no

If not, why? \_\_\_\_\_

**Objective 5: Broad dissemination of technology to the Rail Industry**

Please indicate how best to disseminate this Technical Guidance Note to the appropriate Industry Recipients

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