



Mike Barlow
FPWI
PWI Technical Content Manager



THE PWI PRACTICAL ELECTRIFICATION CHALLENGE OCTOBER 2024



Mike worked for London Underground for over 40 years. In that time he undertook a wide variety of roles including survey, design, renewals, construction, Parliamentary Planning, rail defects, track recording, standards and product approval. Mike retired in November 2021, and is now working as one of the PWI Technical Managers, assisting with the production of the Journal and organisation of seminars. He has also continued his voluntary work for the London Section of the PWI, where he has previously held the positions of Chairman and Secretary.

The fourth week of October 2024 saw the second PWI Practical Electrification Challenge (PEC), with a return to the Network Rail (NR) Jane Austin Electrification Training School at Swindon for the site activities. The PEC grew out of the success of the PWI Practical Trackwork Challenges (PTCs), in that it offers a special opportunity for delegates from the PWI Corporate Members to experience some of the challenges of installing Overhead Line Equipment (OLE). The event is particularly valuable for people who are relatively new to the industry or those who do not usually have the chance to get on site for experience of electrification installation at close quarters.

The Training School provides excellent facilities and a secure and supportive setting as the site is physically and electrically segregated from the NR system. This allows briefings and explanations to be given to the delegates to enable them carry out the work, and have their questions answered without the deadlines of working on the railway. It would not be possible to do this on the national rail network due to the need for specialised training and the potentially hazardous nature of the work.

Once again, the delegates were based at the Leonardo Hotel, which is conveniently located for Swindon station and the Training School. The delegates stayed there on the Tuesday and Wednesday nights, allowing them to network and see presentations about the PEC and some aspects of railway electrification. The delegates came from across the rail industry including the Office of Rail and Road, the Railway Safety & Standards Board, Network Rail, Transport for Wales, AUS Ltd, Furrer+Frey, Volker, Babcock International Group, One Big Circle, AtkinsRéalis, SPL Powerlines UK, Systra, Balfour Beatty and Fugro.

Preparation for the PEC had taken place over many months and included development and review of the programme and safe systems of work, design reviews and risk identification and mitigation. Lessons learned from the first PEC were incorporated to improve and expand the event for the benefit of the delegates. Happily, this year even the weather was better!

After dinner on the Tuesday evening, Noel Dolphin Head of UK Projects for Furrer+Frey welcomed the delegates to the PEC and gave a brief introduction to the event. This was followed by a presentation by Phil Doughty, Chief Mechanical & Electrical Engineer of NR, on general electrical safety and the new NR isolation process. This was followed by a short talk from Joan Heery, the Technical Services Director of the PWI, and Mike Barlow, one of the PWI Technical Managers about the benefits of PWI Membership. Joan covered the range of education courses, textbooks, seminars and Section meetings which the PWI offer to support people with their Continuing Professional Development, and explained how the PWI can provide members with various routes to become professionally registered.

On Wednesday morning the delegates took the short walk from the hotel to the AtkinsRéalis office, where Garry Keenor, Professional Head for Electrification Transportation gave a detailed explanation of OLE, its components and design. This included a summary of conventional OLE installation and differences to what was used for the PEC. This was followed by a presentation by Rob Daffern, Director & Principal Engineer at Furrer+Frey, explaining how to read OLE design drawings and a review of the design for the PEC.

The delegates then walked to the NR Training School, and after booking in and changing into their Personal Protective Equipment (PPE), they moved out onto the training area where they were given a safety briefing by Craig Hall, Head of Operations E & W for SPL Powerlines. They were then separated into four groups led by Brian Gillespie and Liam Allport of SPL Powerlines, together with Martin Chesters and Andy Ward of NR OCR. The programme allowed for the groups to rotate between the different activities and briefings over the two days of the event to give them a wide experience of the work.

One important difference to working on OLE on the NR system is that all of the activities for the PEC were carried out at low-level, so that delegates did not need to be trained and licensed for working at height. Within this constraint, as far as possible the sitework was carried out in a similar way and to a similar standard as would be the case for work on the main line. Throughout the event the delegates were able to get 'hands-on' with most of the tasks and were encouraged to do so.

LESSONS LEARNED FROM THE FIRST PEC WERE INCORPORATED TO IMPROVE AND EXPAND THE EVENT FOR THE BENEFIT OF THE DELEGATES. HAPPILY, THIS YEAR EVEN THE WEATHER WAS BETTER!

As a new feature of the PEC for 2024 we were pleased to welcome Supporters to the event, namely Gripple, Mosdorfer and Cembre. The delegates had the opportunity to visit all of them on Wednesday and were given detailed explanations and demonstrations of various tools, equipment and components.

Following a visual familiarisation of the site and laying out of materials, Wednesday commenced with each group assembling and preparing a cantilever for installation. The groups then fitted the cantilevers onto the mast brackets and adjusted them to comply with the design drawings. This was followed by the installation of termination brackets. This created fully assembled cantilevers ready for the catenary wire to be run after lunch.

Following lunch, the groups rotated between various activities, including visits to the Supporters stands. The activities included –

- Fitting of bonds to rails
- A review of different types of droppers
- A briefing and demonstration by Rob Daffern of section insulators and neutral sections

Later that afternoon the groups combined to run-out and install the catenary wire, which required closely controlled teamwork. Once the catenary wire had been tensioned, (to a lower value than would normally be required), the delegates tidied the site and after changing out of their PPE the delegates booked out of the Training Centre and returned to the hotel.

Following dinner at the hotel there was a brief review of the day's activities, and a summary of those planned for tomorrow. Garry Keenor of AtkinsRéalis gave a presentation covering the role of

conductor whereas the contact wire is a solid and relatively inflexible bar. This makes it more of a challenge to handle and install than the catenary wire. Once it had been run out the delegates were shown how to remove twists in the contact wire and were able to try this for themselves.

Once the delegates had reformed into their groups the contact wire tension was then checked and adjusted, and the cantilevers and droppers were registered, with the contact wire being fitted into the dropper arms and the system height being checked. This was followed by a demonstration of the installation of in-span insulation.

Rob Daffern provided repeat and follow-up briefings on neutral sections and section insulators Garry Keenor showed each Delegate group examples of weights-based tensioning system and section insulators.

After lunch there was an exercise in carrying out quality checks and the collation of Handback information. It was then time for the delegates to dismantle the OLE which they had installed and leave the site tidy ready to be handed back to NR.



railway electrification in society and its benefits, and the need to convince decision-makers of these benefits. Garry included a brief history of UK rail electrification, and considered how specialisation of technical roles, (not just in electrification), risked creating a disconnect between designers and installation teams. This was followed by a presentation from Noel Dolphin on lessons learned from electrification projects. The delegates were then invited to give informal feedback on the first day, with their comments being noted for inclusion in lessons learned for future events.

Thursday morning commenced with a repeat visit to AtkinsRéalis offices for another briefing. The delegates then retraced their steps to the Training School to change into their PPE and be re-briefed on safety issues and the work plan.

The delegate groups again combined for the first action of the day which was to run out the contact wire. The latter is a stranded

After changing out of their PPE the Delegates returned to the AtkinsRéalis office for a brief review of the PEC, following which they were invited to give any feedback they wished to. This was followed up after the event by the opportunity to provide feedback online. The day concluded with the Delegates being presented with their certificates.

The PEC once again brought together volunteers, Supporters and experienced personnel to give the Delegates a greater appreciation of many of the practical challenges in the construction of OLE. In doing so it also demonstrated some of the very best aspects of working in the rail industry. Overall feedback has been very positive and the comments received will be fed into 'lessons learned' for future PECs.



THE PWI



TECHNICAL ARTICLE

► www.thepwi.org

AS PUBLISHED IN THE PWI JOURNAL **JANUARY 2025** **VOLUME 143 PART 1**

If you would like to reproduce this article, please contact: journaleditor@thepwi.org

PLEASE NOTE: Every care is taken in the preparation of this publication, but the PWI cannot be held responsible for the claims of contributors nor for the accuracy of the contents, or any consequence thereof.

 the PWI

 the_pwi

 the PWI

 PWInstitution

 PWInstitution