

## **ER P24 Task Group**

### **Terms of Reference**

#### **1 Introduction**

The Energy Networks Association (ENA) is responsible for maintenance of Engineering Recommendation (ER) P24, *AC Traction Supplies to British Rail*. P24 provides guidance and recommended practice for provision of 25 kV AC rail supplies and covers a range of topics from the characteristics of traction load and estimation of electrical disturbance (e.g. voltage fluctuations, voltage imbalances and harmonics) to supply arrangements, equipment and earthing. P24 is referenced in both the Grid and Distribution Codes of Great Britain and is an 'industry standard' in this technical area.

As P24 Issue 1 was last published in 1984, a revision of the document by a Task Group has been proposed by the ENA under the auspices of the Distribution Code Review Panel (DCRP) of Great Britain (GB). The Grid Code Review Panel (GCRP) will also be kept updated during the revision work also. The Task Group will be made up of ENA Member Company representatives and third party technical experts where appropriate.

Recommendations and considerations for the revision of P24 have been captured in an initial review report (Threepwood Report\_ENA\_ENA089\_ER\_P24\_v1.0\_Issued).

In addition to the revision of P24, ENA has proposed a revision/rewriting of ENA TS 41-15 Part 9, *Standard Circuit Diagrams in 132 kV Substations – A.C. Traction Supplies to British Rail*. An initial review report (Threepwood Report\_ENA\_ENA089\_TS\_41-15\_v1.0\_Issued) recommends the rewriting of this document to create a functional specification for protection and control arrangements for 25 kV AC traction supplies, replacing the existing circuit diagrams. As ENA TS 41-15 Part 9 is closely linked to P24, the Task Group will consider the details for the revision/rewriting of ENA TS 41-15 Part 9.

Other closely related ENA Engineering documents which the Task Group will consider and review are ENA ETR 116 and ENA ER G38.

The following document sets out the Terms of Reference for the ER P24 Task Group.

#### **2 Objective**

The objective of the P24 Task Group is to update the technical guidance within the document to reflect the latest processes, arrangements, Standards and specifications employed by Distribution Network Operators (DNOs) and Transmission System Operators (TSOs) in GB in the provision of 25 kV supplies to Network Rail.

The intention is that the revision will retain the current topics and structure of P24. Amendments, deletions and additions will be required to update the content with the latest technologies and Standards.

The Task Group will seek to be fair and even-handed with respect to technical changes to the document.

The outputs from the Task Group will be a series of working drafts for Issue 2 of the P24. The planned working drafts are as follows:

- ER P24 Issue 2 first working draft for comment
- ER P24 Issue 2 second working draft for comment
- ER P24 Issue 2 final working draft for comment
- ER P24 Issue 2 draft for approval

The Task Group will be responsible for ensuring that changes considered necessary to P24:

- support the codes in the Grid and Distribution Codes;
- align with national and international Standards, as far as possible;
- reflect good practices;
- promote progressive relationships between Member Companies and Network Rail;
- are technically correct.

The Working Group will be mindful of changing technologies and their impact on P24. The need for future reviews of P24, in light of foreseen changes to technology and Standards, and any time-bounding of recommendations will be considered.

### **3 Membership**

Membership will be open to nominated representatives from the key stakeholders:

- DNOs
- TSOs
- Rail infrastructure owners, i.e. Network Rail
- Traction supply experts, i.e. industry consultants

Membership will take the form of 'Sitting Members' and/or 'Corresponding Members'.

Changes to Membership of the Task Group will be agreed by ENA.

### **4 Scope of Review**

The scope of review of P24 will cover the following aspects.

#### **4.1 Technology overview**

a) Consider updating terminology and explanations regarding traction drive technology, in particular the use of AC motors controlled via variable frequency and voltage.

#### 4.2 Types of supply point to railway systems

a) Addition of guidance for supply arrangements to the 275/400 kV transmission network using auto transformers as used extensively by Network Rail and National Grid.

#### 4.3 Nature of traction current

a) Consider updating guidance on nature of traction current to reflect technology used today, in particular, modern power electronics.

#### 4.4 Load and disturbance estimating

a) Consider processes used to estimate load and disturbance of a proposed traction supply

b) Consider addition of guidance on the use of the latest network study techniques. Take account of modelling and simulation software tools capable of complex calculations and high degrees of accuracy.

#### 4.5 Disturbance limits and reduction of disturbances

a) Review the existing disturbance limit values and consider whether amendment is necessary. Co-ordinate any changes with the findings of the ER P28 Working Group (relevant contact is Gary Eastwood).

b) The work will include a review of ENA ETR 116 *Report on voltage unbalance due to British Rail AC traction supplies*.

c) Consider the addition of guidance on the use of flexible AC transmission systems (FACTS) for railway supplies. Co-ordinate any changes with the findings of the 25 kV Static Converter Technology Working Group (relevant contact is Alex Buchinger).

#### 4.6 Equipment, protection, earthing

a) Consider updates necessary to reflect the latest specifications, standards and design for equipment (switchgear, transformer, cables etc), protection and earthing. It is not the intention to develop standalone equipment specifications but rather include high level requirements and normative references.

#### 4.7 Operational safety aspects

a) Consider updates to operational aspects such as equipment ownership/boundaries.

b) The work will include a review of ENA ER G38 *Operational procedure associated with electricity supplies for traction purposes on AC and DC electrified lines*.

#### 4.8 International/European Standards

a) Consider all relevant Standards for inclusion as a reference in P24, covering topics such as supply voltage, safety, earthing and equipment.

#### 4.9 Revision of ENA TS 41-15 Part 9

a) Consider and agree replacement of ENA TS 41-15 Part 9 with a new document focusing on functional requirements for protection/control schemes.

#### 4.10 Consider validity of ER P24 remaining a DCODE Qualifying Standard

The Task Group shall consider the validity of P24 remaining an Annex 1 DCODE Standard against the the DCRP Constitution and Rules.

### **5 Facilitation**

Facilitation and secretariat support for the Task Group will be provided by the ENA and their nominated representative.

The Facilitator will ensure that the Task Group follows governance procedures as set down by the DCRP.

### **6 Meetings**

Meetings of the Task Group will be chaired by an appointed ENAMC representative. The Chair shall liaise closely with the Facilitator to ensure the Task Group operates effectively and efficiently.

Nominations for the position of Chair and Deputy Chair will be sought from Sitting Members of the Task Group. If appropriate, nominations for Chair and Deputy Chair will be reviewed by the DCRP prior to appointment.

Sitting Members will be invited to attend meetings of the Task Group; Corresponding Members will not normally be invited to attend meetings but will be invited to comment on all other aspects under consideration by the Working Group. External parties, such as technical specialists, may be invited to attend and contribute to meetings on an exceptional basis; stakeholders will be able to object to attendance by any external party.

Sitting Members will be expected to attend a meeting of the Task Group for each document draft proposed. A stakeholder, who has 'Sitting Membership' of the Task Group will be allowed to send a substitute representative to meetings of the Task Group, where the nominated representative is unable to attend. The substitute representative will be appropriately qualified and experienced to contribute to the meeting(s) of the Task Group. Where attendance at a meeting is not possible, the Sitting Member will send their apologies sufficiently in advance together with details of their substitute representative for acceptability by the Secretariat.

An agenda and arrangements for each meeting will be notified generally one month in advance by the Facilitator of the Working Group together with details of any proposal to invite external parties to the meeting. Additional meetings may be held when the majority of Members agree there is an essential requirement.

## **7 Liaison with Other Panels and ENA Working Groups**

It is essential that the review of ER P24 is coordinated with the work of other ENA Working Groups as identified in Clause 4.

Minutes from meetings and regular updates on the progress of the Task Group will be prepared and circulated by the Task Group Facilitator to other Panels and ENA Working Groups, as appropriate.