WHITE PAPER

York EMC Services

EMC in the Rail Environment

Assessing Risk in Depots

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EMC In the Rail Environment—Assessing Risk in Depots

EMC (Electromagnetic Compatibility) is an important part of any Rail Project, be it recommissioning or refurbishing Rolling Stock, or managing the updates or new builds of Depots and Stabling facilities.

EMC management, from a risk based point of view, is something that needs to be carried through all of the stages of a project; ideally from conception to completion. This is the job of the EMC Risk Assessment.

It is advantageous to the project and the EMC engineers for the Risk Assessment process to start as soon as possible. The Risk Register which is then created is updated throughout the life of the project. It is possible to create the Risk Register at the Feasibility or Option selection stages, and certainly once the outline of the project is known. This avoids the issues encountered by mitigating risks on already installed or purchased equipment during the commissioning phase.

Figure 1: High frequency on-site EM measurements at a new-build Depot.

The difficulty arises when keeping the EMC process up to date throughout the life of the project, as contractors and subcontractors generally change at the different stages. Ideally the Risk Register is populated before designs are finalised; then subsequent activities reduce the hazards identified in the Risk Register to ALARP (as low as reasonably practicable) by the end of the project.

Figure 2: EM Site survey covering all frequency ranges being measured during construction of re-built depot.

One of the actions possible to reduce risks are on-site measurements, both before and after energisation. The reasons for performing measurements prior to any works include: Benchmarking the existing emissions so that a comparison may be made with the new installation(s); identifying any particular EM threats at the location for inclusion in the hazard analysis and the design review; gathering evidence in the case that future claims are made by neighbours or users regarding interference to radio communications services or other equipment.

Induction from traction current and other HV feeder systems can be modelled, and if an issue is identified, designed out of most railway installations. This is often an important step in reducing the hazards in the Risk Register, and is of obvious benefit to carry out at a design stage before cabling is installed.

In terms of compatibility of the railway with itself, it is of course of vital importance that the signalling systems are not interfered with by both external effects or by the railway itself.

In order to ensure that this is unlikely, the Risk Assessment will highlight any situation that may result in a malfunction of equipment or apparatus. This will then be closed out by subsequent activities, for example Procurement Reviews or Compliance Matrices, or by Signalling Compatibility Studies or testing if required.

A Final Hazard Analysis is normally carried out to provide an end-of-project Risk Register in which all hazards will have either been closed or set to ALARP.

Figure 3: Measuring emissions at a location where the Risk Assessment suggests there will need to be a check once installation is complete.

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We offer a choice of training specifically designed for the rail industry.

For those needing comprehensive training, our five-day "**Fundamentals of EMC in Railways**" course is designed to deliver an in-depth study of EMC in the complex railway environment. It provides an understanding of the importance of managing EMC from project concept to completion.

The legal EMC requirements will be explained and how these are satisfied by use of standards and the Technical Documentation.

The course includes general EMC background topics such as EM waves and radiation, decibels, the EMC Directive and commercial standards. Railway specific topics include an introduction to railway EMC standards, overview of signalling, threats and AC and DC traction.

The course also covers technical documentation, interoperability and EMC management throughout the project.

The New Legislative Framework (NLF), and the new EMC Directive 2014/30/EU which comes into force on 20th April 2016, are also presented, bringing you fully up to date with current and future requirements.

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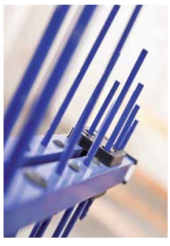


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