

EMC Services

September 2016

Services	Description and Examples
EMC Management Plans & EMC Control Plans	<p>EMC Management Plans are used on large projects where there may be multiple sub-projects with their own EMC Control Plans. The Management Plan gives the overall requirements for the project. The EMC Control Plan provides the requirements and deliverable for a project with details on how they will be achieved. Example include:</p> <ul style="list-style-type: none"> • EMC Management Plan for the Northern Line Extension • EMC Management Plan for Jubilee Line Upgrade 2 • EMC Control Plan for Bank Bloomberg Place Project (additional entrance for Waterloo & City Line) • EMC Control Plan for Crossrail C530 (Woolwich Station and associated Portals) • EMC Control Plans for light rail projects in Vancouver and Toronto
EMC Strategy	<p>An EMC Strategy is a Network Rail requirement given in their EMC Assurance Standard NR/L2/RSE/30041. Examples include:</p> <ul style="list-style-type: none"> • EMC Strategy for West Hampstead Station • EMC Strategy for Bromsgrove Electrification
EMC Interface and Hazard analysis	<p>This activity identifies all the main interfaces, from an EMC perspective, both within a project and external 3rd parties. It identifies the EMC hazards between the interfaces and carries out a risk analysis. It usually also identifies suitable mitigation to reduce the risk. Examples include:</p> <ul style="list-style-type: none"> • EMC Hazard Analysis for Crossrail C530 • EMC Hazard analysis for Bromsgrove Electrification • EMC Hazard analysis for West Hampstead Station
EMC Compliance report	<p>EMC Compliance reports give the EMC status of project at various stages of the project. Examples include:</p> <ul style="list-style-type: none"> • EMC Compliance reports for Piccadilly Line extension to Heathrow T5 • EMC Compliance reports for various packages of work on Crossrail C530
EMC design reviews	<p>EMC design reviews ensure that EMC has been taken into consideration in the design before it is accepted and construction begins. Examples include: EMC design review on Piccadilly Line extension to Heathrow T5, Jubilee and Northern Line Upgrade, DLR Stratford International Extension, NLE, JLU2, Bank Bloomberg Place, Crossrail C530.</p>
EMC Test Plans	<p>EMC Test Plans gives the requirements, methods and deliverables for EMC testing either in a lab or on site. Examples include test plans for:</p> <ul style="list-style-type: none"> • DLR SIE • Thameslink Programme • Bromsgrove Electrification • EMC Test Plan for light rail projects in Toronto.

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EMC Technical Files	<p>EMC Technical Files or Documentation are usually the final EMC deliverable in a project and demonstrates compliance to the EMC Directives and other contractual requirements. Examples include:</p> <ul style="list-style-type: none"> • EMC Technical File for Piccadilly Line extension to Heathrow T5
EMC Safety Justifications	<p>In projects involving safety critical systems it is usual to produce an EMC safety Justification to support the overall safety argument.</p> <ul style="list-style-type: none"> • EMC safety justification for Piccadilly Line extension to Heathrow T5
EMC Standards	<p>Good understanding of various EMC standards and able to advise on the appropriate standards</p>
EMC Design	<p>In order to ensure products or system are EMC compliant and do not require expensive re-working specialist EMC knowledge at the design stage is essential. Skills include design for EMC at:</p> <ul style="list-style-type: none"> • circuit board level • equipment level • system level
EMF	<p>Electromagnetic fields and their impact on human health is increasingly becoming part of the EMC remit on new projects. EMF studies calculate the levels of magnetic and electric fields from systems and compare the levels to regulatory limits or standards.</p>
EMC modelling	<p>EMC modelling can be used to optimise a design from an EMC perspective or ensure compliance with an EMC requirement. It can be particularly useful when assessing induced voltages under full load or fault conditions or looking at interference to signalling systems where testing can be impractical or difficult to arrange. Examples of modelling include:</p> <ul style="list-style-type: none"> • Multi-conductor model used to investigate the impact of earthing and bonding on track circuits on the 4LM project • Multi-conductor model used to look at induced voltage from power to signalling cables in order to produce cable separation guidelines for the 4LM project. • Modelled the interference between substation and TBTC system at Finchley Road on the Jubilee Line. • Model the effect of fault condition on the Manchester metro on DC track circuits used on adjacent NR lines. • Model the effect of a new tram system in Birmingham and its impact on adjacent NR track circuits. • Modelled the impact of the DLR SIE on adjacent railways including Jubilees Line and NR signalling and telecommunication assets.
EMF modelling	<p>EMF modelling calculates the levels of magnetic and electric fields from systems for comparison to regulatory limits and standards. Examples include:</p> <ul style="list-style-type: none"> • Magnetic fields from 11kV cable along the route of the DLR SIE • Magnetic fields from multiple 33kV cables in a proposed new NR cable tunnel • Electric and magnetic fields from a proposed new generator compound in a hospital.

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Earthing, bonding and stray current	<p>Earthing and bonding can impact EMC so it is important that EMC considerations are taken into account during the E&B design. It can also have an impact on stray current that can then cause corrosion or interference. This is particularly important in complex areas such as AC traction systems interfacing with DC traction systems. Examples include:</p> <ul style="list-style-type: none"> • Stray current measurements on DLR SIE • Stray current Strategy for Thameslink • Stray current measurements in the Thameslink core area • The effect of E&B on signalling assets on NR in Manchester • The effect of E&B on signalling assets on 4LM
Practical EMC problem solving	<p>When interference problems do occur it is essential that suitable technical knowledge and experience can be applied to solve the issue in a timely and cost effective manner. Examples include:</p> <ul style="list-style-type: none"> • Interference from VSDs to analogue CCTV • Interference from substation affecting TBTC signalling system