



24th April 2019

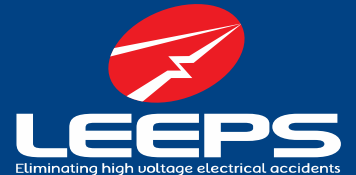
Developments in 25kV Isolation and Earthing

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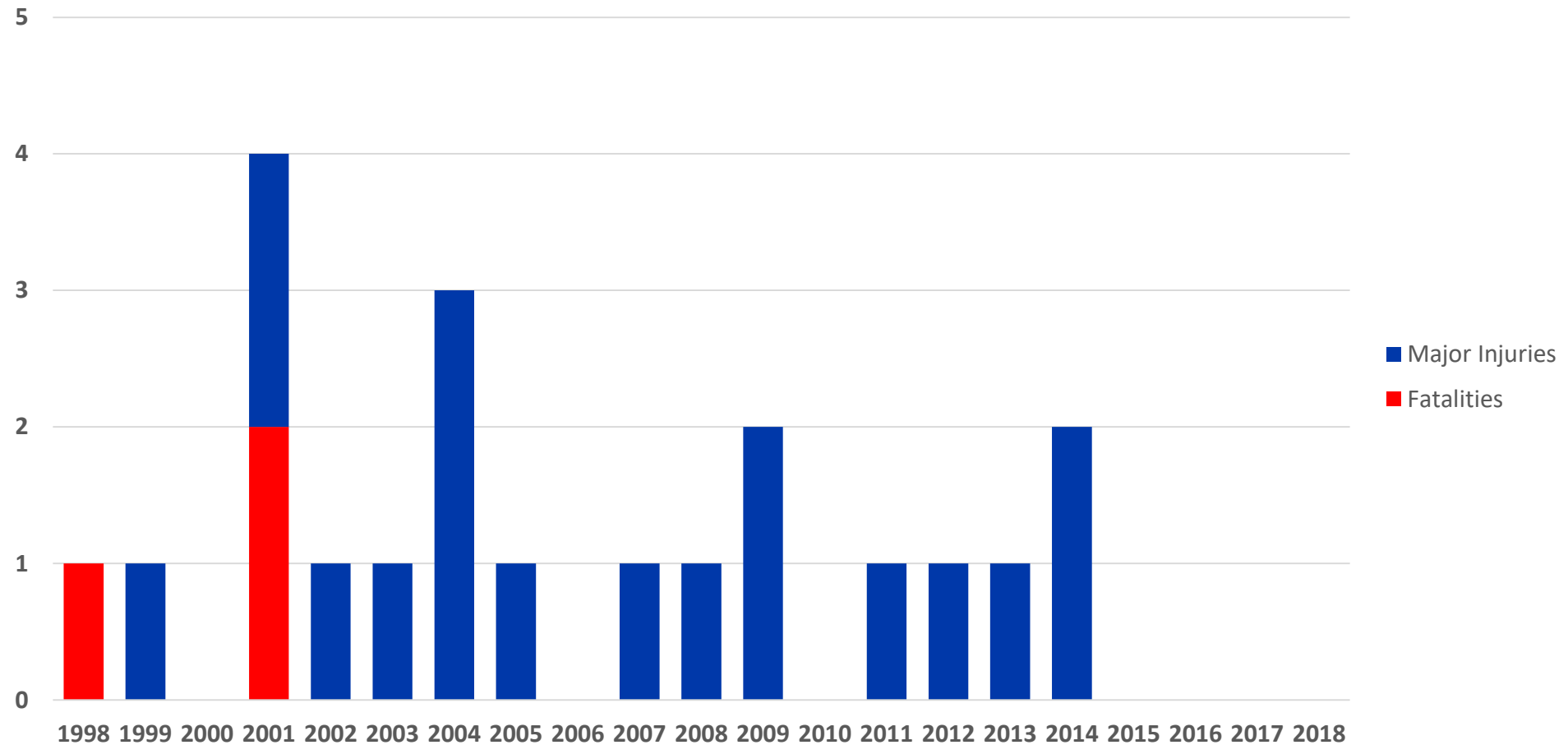
Eliminating high voltage electrical accidents



Key Topics

- Lessons from the past
- The technology of today
- The future processes
- The key messages
 - The view from the ballast rather than the basket!

AC Major Electrical Incidents 1998 - 2018



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Lessons from the Electrical Accidents

- Residual electrical hazards catch us out – very occasionally someone comes into contact with a live 25kV conductor
- Late changes to the plan increases the likelihood of coming into contact with live conductors
- Those that are working on conductors, the OLE teams, are disproportionately at risk
- The next most likely group to be involved in contact with live conductors are those working in rolling stock depots and sidings
- The third most at Risk group are the Permanent Way teams

The Testing Revolution



Working with electricity



Always test before applying earths or straps.

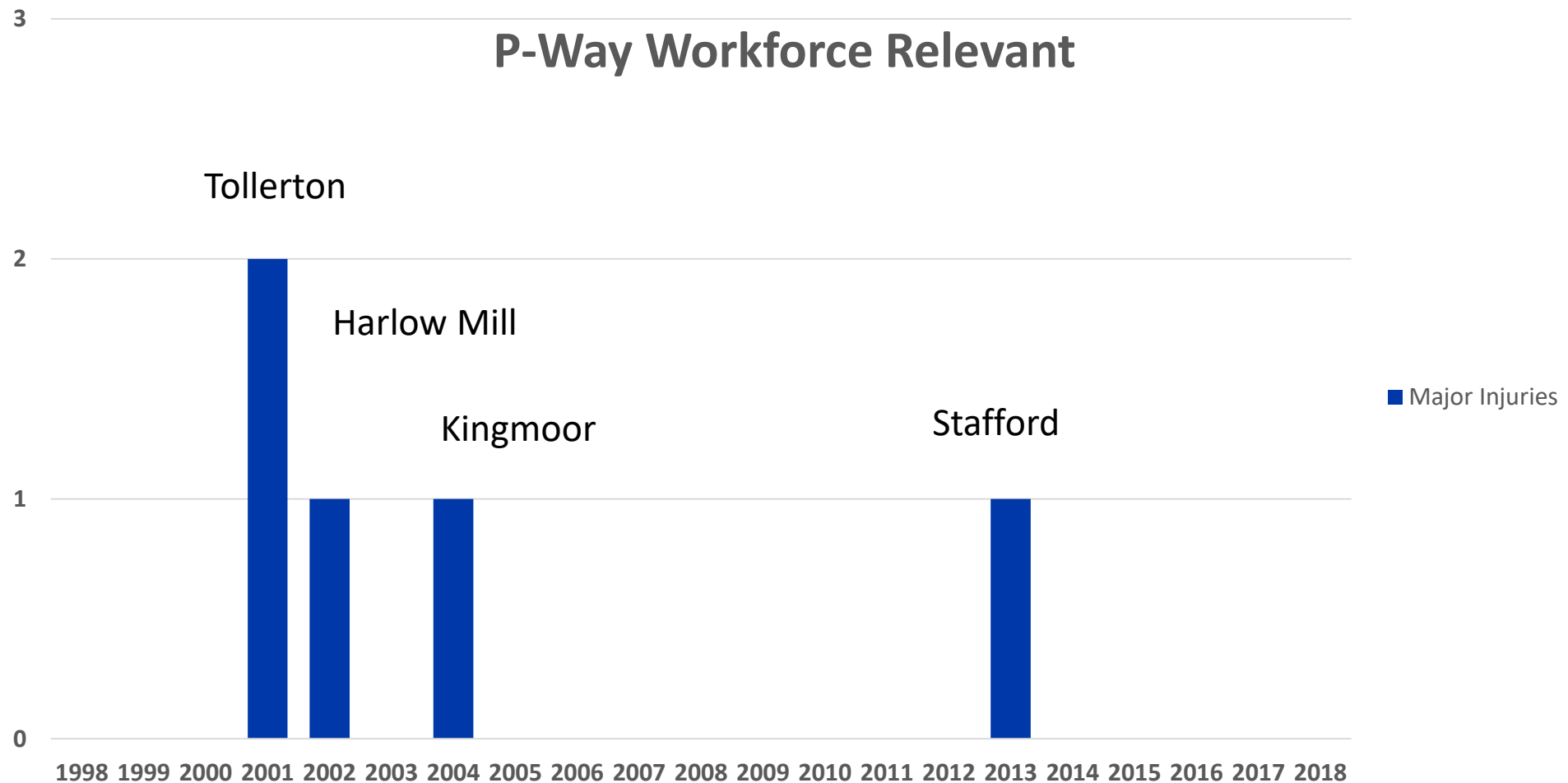


Never assume equipment is isolated – always test before touch.



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AC Major Electrical Incidents 1998 - 2018

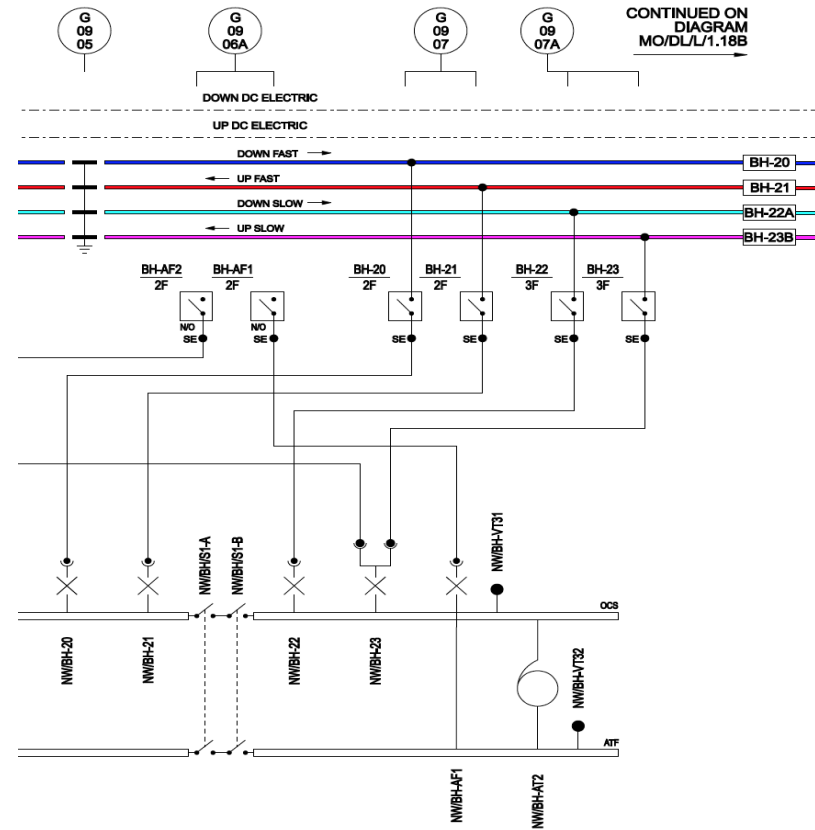
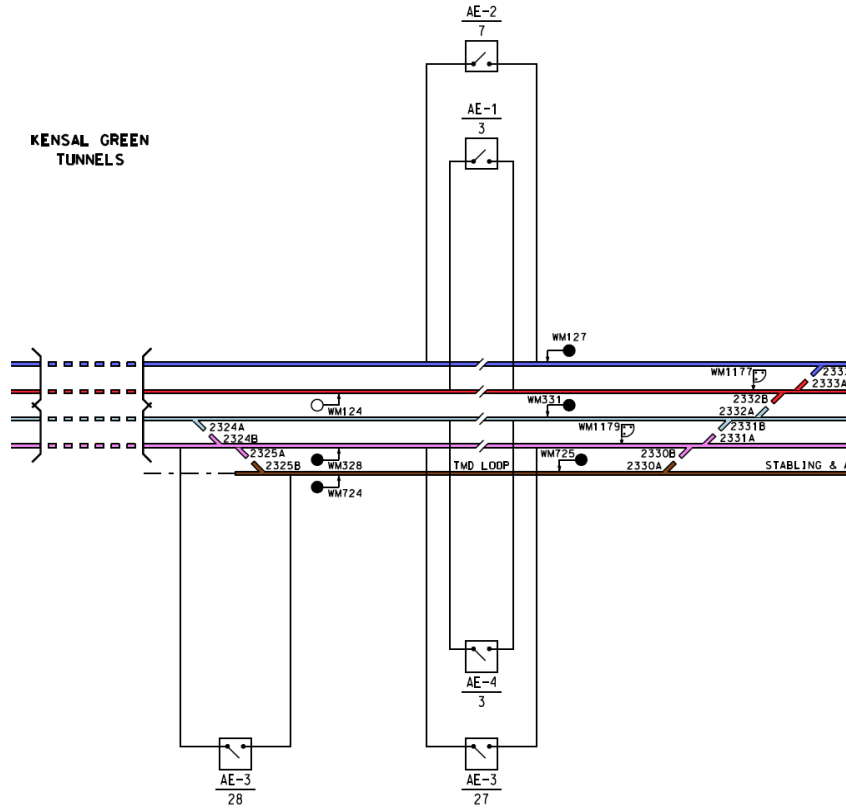


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Key Causes of P-way Accidents

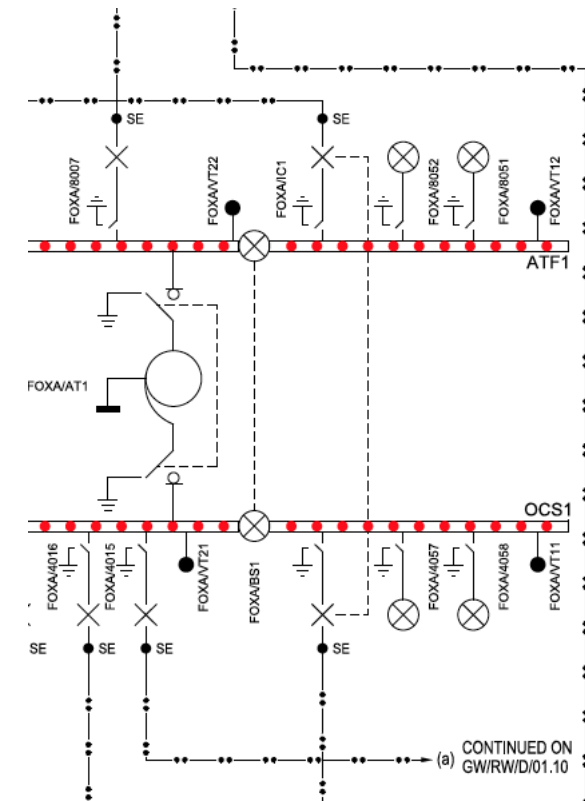
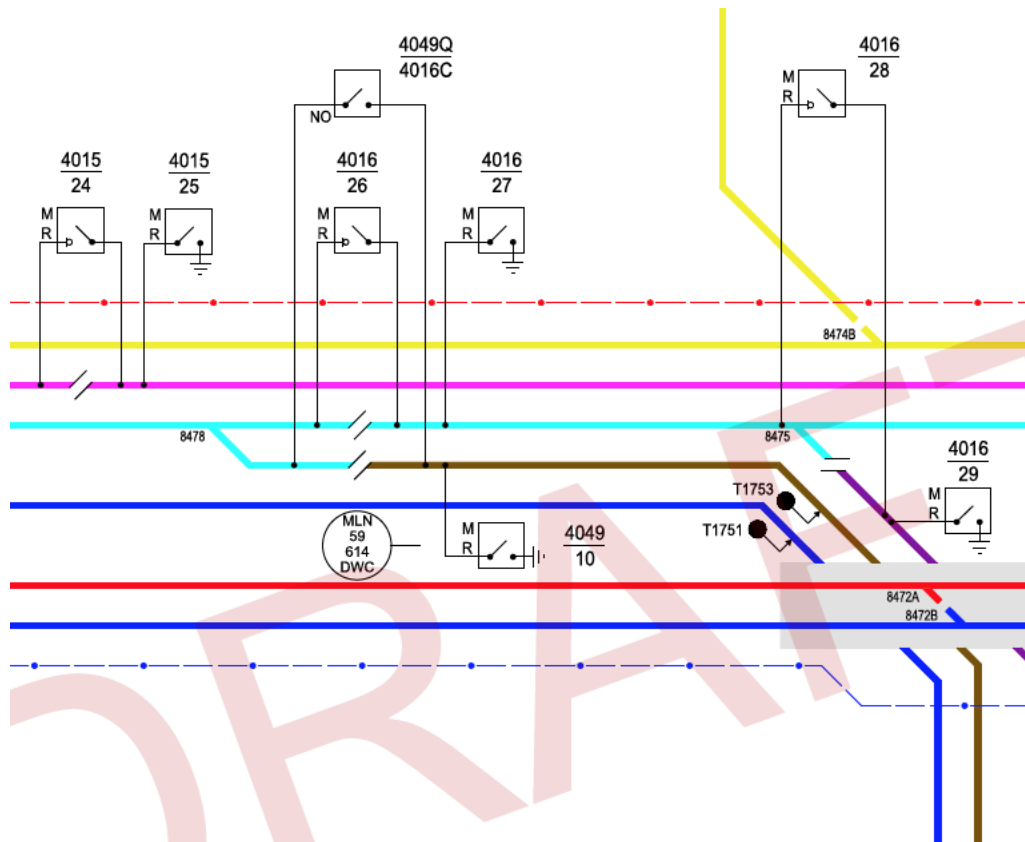
- Late changes to the plan are nearly always a contributing factor to the historical accidents
- Lack of understanding of the electrical hazard and failure to properly risk assess
- Staff working at height on engineering trains

WCML Isolation Diagram



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GWML Isolation Diagram



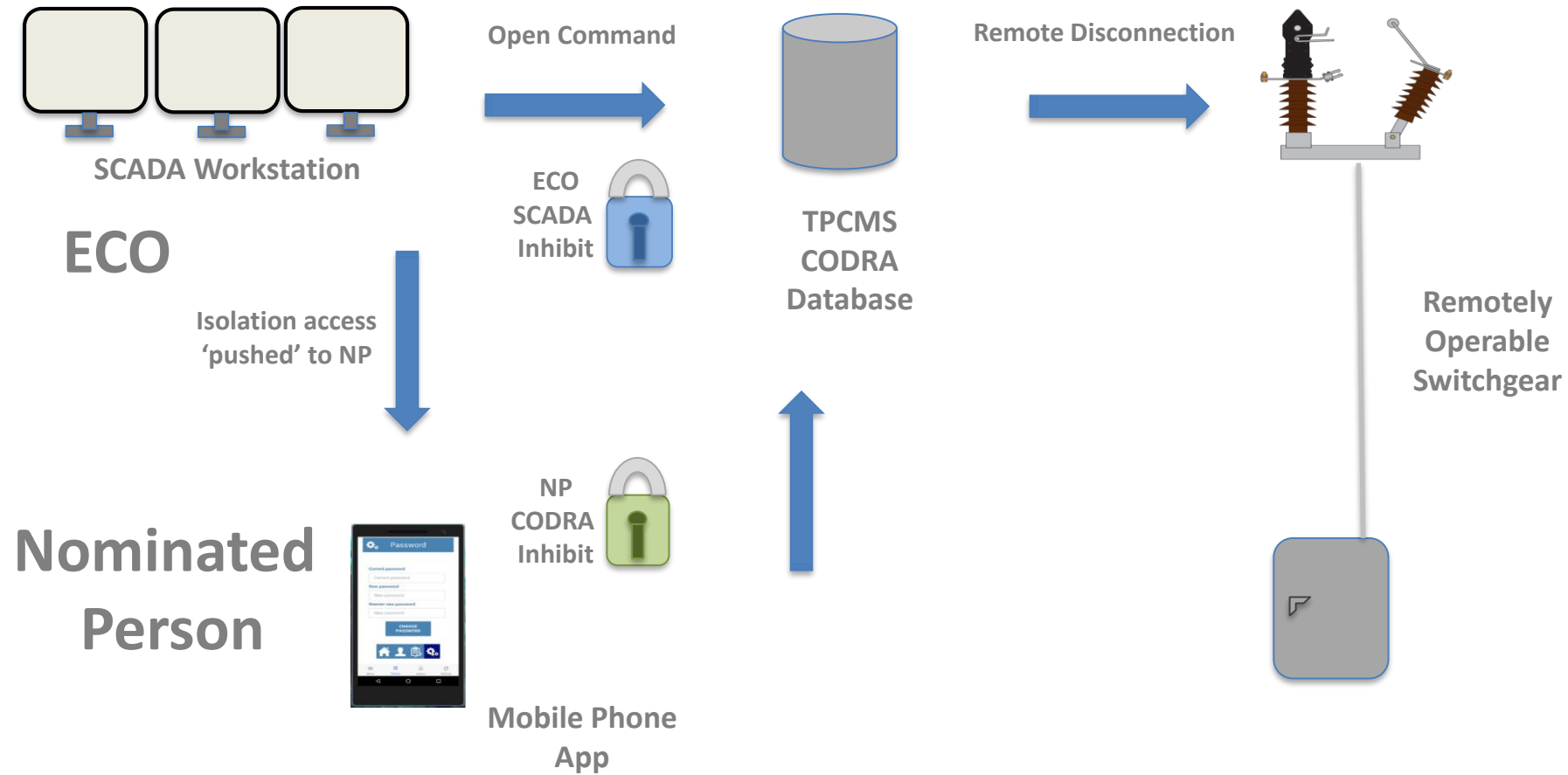
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New Technology & Infrastructure



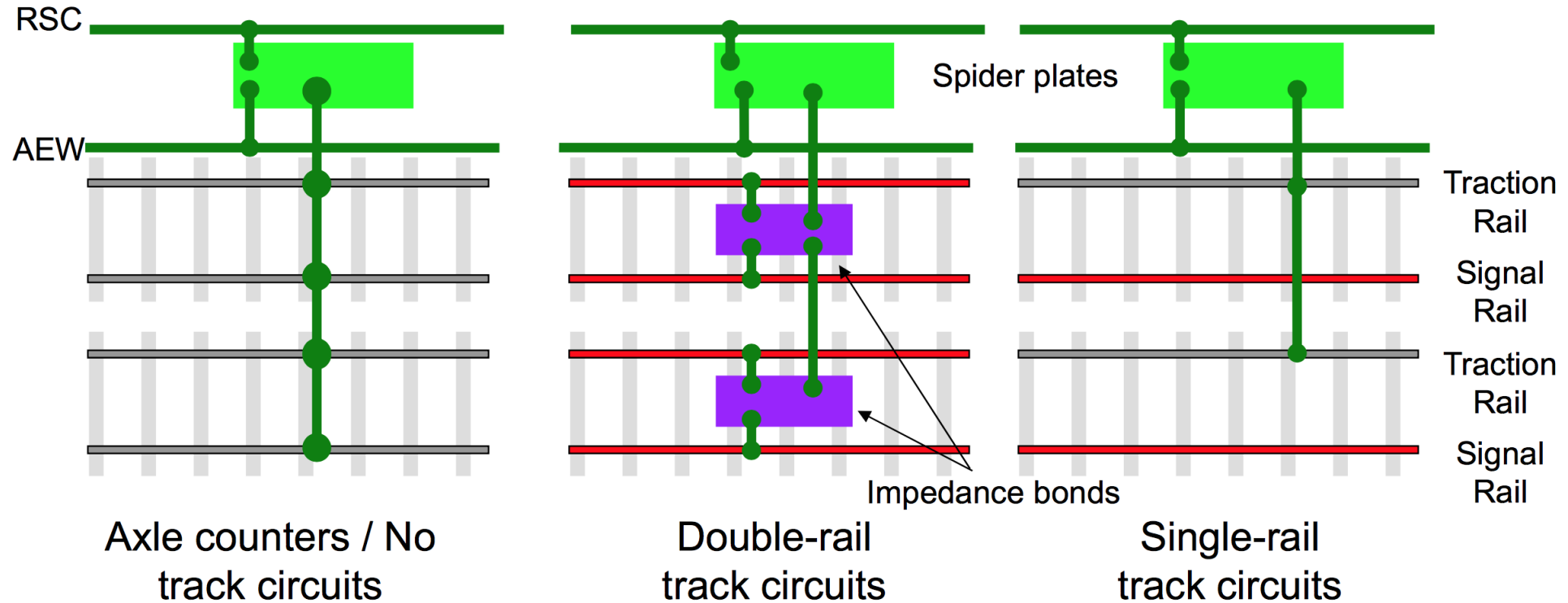
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Safer & Faster Isolations



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Modern Bonding Arrangements



Courtesy of Peter Brown – Network Rail

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New Processes

- Single Approach to Isolations (SAI)
 - Compliant to the Electricity at Work Regulations 1989
 - Builds in the lessons of the historical accidents
 - Common process for the OLE, con-rail and substations
- Standard 25000 replaces the 'Green Book'
- Improved focus on electrical risk assessment, communication and demarcation of residual electrical hazards.

Key Messages

- The electrical life saving rules offer an additional layer of protection from coming into contact with 25kV
- Beware of late changes to the plan and avoid contact with the electrification assets
- Technology facilitates faster and safer isolations
- No waiting at the RRAPs for the isolation!
- The Single Approach to Isolation focuses on electrical risk assessments and matches control measures to risk.