

# Single Approach to Isolation (SAI)

A decorative graphic on the left side of the slide, consisting of a series of vertical blue bars of varying heights connected by horizontal lines, resembling a stylized railway track or a fence.

## Introduction to the electrical risk assessment form (ERAF)

A decorative graphic on the right side of the slide, identical to the one on the left, consisting of a series of vertical blue bars of varying heights connected by horizontal lines, resembling a stylized railway track or a fence.

NR/L3/ELP/SAI25 Working on or near Overhead Line  
Equipment (SAI)

# Agenda

- ✓ How will the industry move towards using a single approach to isolation on OLE?
- ✓ The new standard - NR/L3/ELP/SAI25
- ✓ Single approach to isolation on OLE
- ✓ ERAR – Electrical Risk Assessment Reviewer
- ✓ ERAF – Electrical Risk Assessment Form
- ✓ Round up and what's next?

# How will the industry move towards using a single approach to isolation on overhead line equipment?

NR/L3/ELP/29987  
Issue 6

Introduction of  
Reminder of Live  
Exposed (RoLE) on  
Overhead Line  
Equipment (OLE)



Introduced  
2021-22

Electrical Safety  
Culture

National electrical  
safety step-up for  
frontline teams across  
the industry



Completing  
Sept 2023

Phase 0  
NR/L3/ELP/27720

Introduction of a new  
standard to refresh  
the Test Before Touch  
process on OLE



Published  
September 2022

Phase 1  
AP/NP Pre-Requisites

Trial of on-site  
assessments



Complete

Phase 2  
NR/L3/ELP/29987

Issue 8 introduced  
new terminology with  
a supporting film and  
update

Published  
September 2022

Phase 3  
NR/L3/ELP/SAI25

Issue 1 introduced the  
electrical risk  
assessment and  
supporting changes,  
two new competences  
and training and  
briefing for impacted



Published  
June 2023

Safety improves with every step towards the single approach

# Industry move towards using SAI on OLE continued....

## Phase 4 NR/L3/ELP/SAI25

Issue 2 introduces Mod D 'Distribution System Interface' Requirements



Publication  
Dec 2023

## Phase 4.5 NR/L3/ELP/SAI25

Enables Remote Securing



CP7  
2024 onwards

## Phase 5 NR/L3/ELP/SAI25

introduces Optimised Earthing, Neutral Section and Return Conductor Earthing



CP7  
2024 onwards

## Phase 6 NR/L3/ELP/25000

Implementation of Issue 2  
  
Replaces SAI25



CP7  
2024 onwards

## Phase 7

Further improvements to training



CP7  
2024 onwards

## Phase 8 NR/L3/ELP/25000

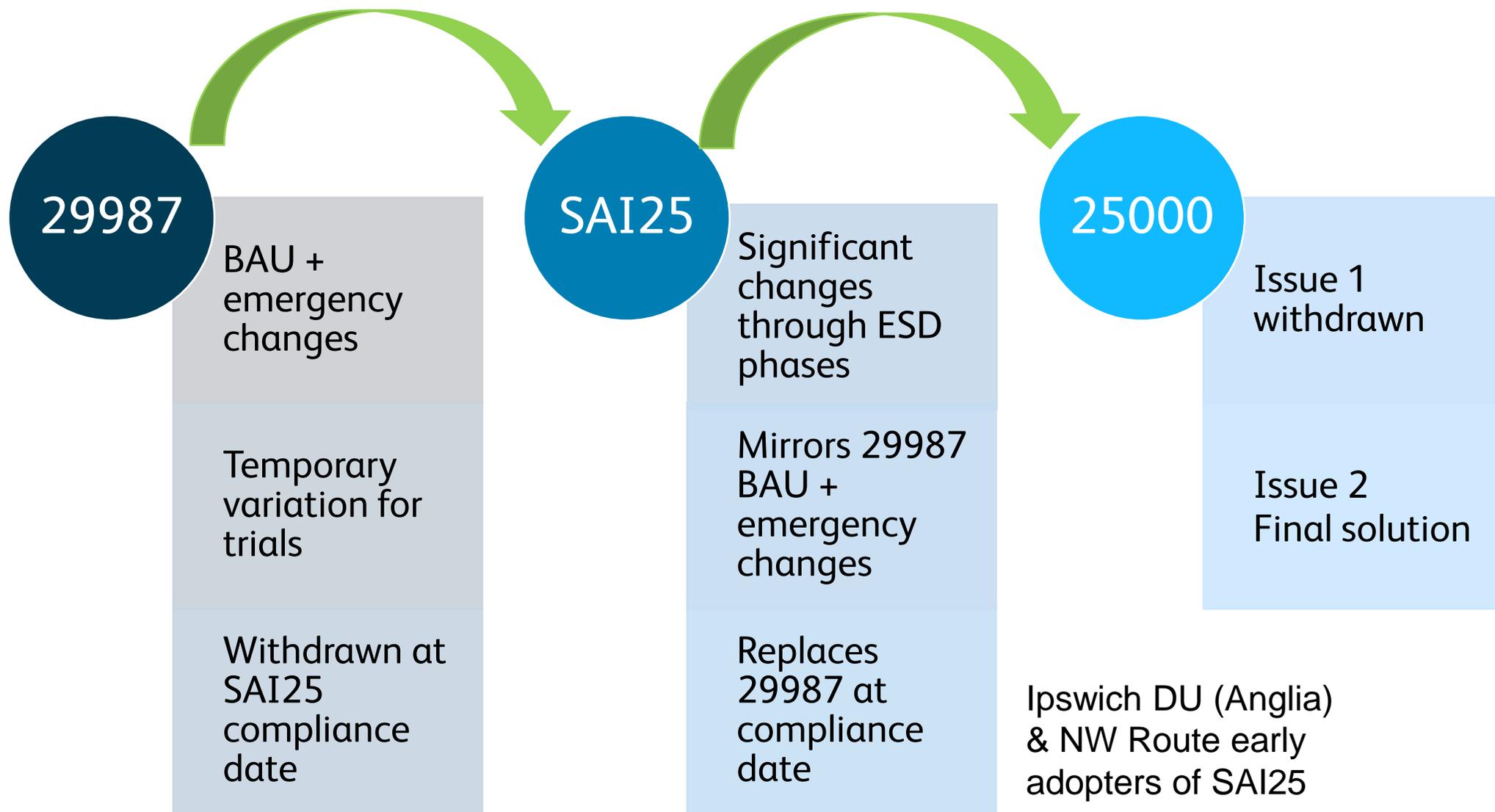
Post Implementation Review



CP7  
2024 onwards

Safety improves with every step towards the single approach

# NR/L3/ELP/SAI25 Working on or near overhead line equipment



**Progression will be in agreement with your Route/Region contact**

# Single approach to isolation – overhead line equipment

- Phase 3 introduces the following changes via a new standard NR/L3/ELP/SAI25 Issue 1
  - Improved process for electrical risk assessments
  - Introduction of new competence\* for Electrical Risk Assessor (ERAs) and technical briefings for existing competency holders
  - Enhanced electrical risk control measures
  - Introduction of the electrical safe system of work
- Published in June 2023
- A two-year compliance date applies to accommodate training and briefing

# Single approach to isolation – overhead line equipment

- Phase 4 introduces the following changes via the standard NR/L3/ELP/SAI25 Issue 2

- New processes for the interface between overhead line equipment and distribution infrastructure for the maintenance of lineside track feeder disconnectors, HV cabled circuits and the associated certification.
- Introduction of the live working form.
- Clarification of responsibilities for the review of the electrical risk assessment\*

- Will replace Issue 1 when published in December 2023
- Compliance date of September 2025 remains the same

## \* Electrical Risk Assessment Reviewer (ERAR)

The Electrical Risk Assessment Form is reviewed and countersigned by a second person when there is a heightened electrical risk associated with the works:

- Electrical Risk Assessor waiving a pre-site visit; or
- When work is taking place that will bring colleagues into the 2.75m zone of exposed Live conductors; or
- Where work includes OTP on and off tracking/travelling under live OLE and it is not included on the Electrical Safe System of Work (ESSoW) category L list of approved tasks; or
- Work is being carried out under ESSoW category E, and is not included on the ESSOW category E list of approved tasks; or
- Where an Electrical Risk Assessment Form is being reused and includes ones of the above criteria.

- **Electrical Risk approver (ERAp) removed, Electrical Risk Assessment Reviewer (ERAR) new duty**

# Electrical Risk Assessment Reviewer (ERAR) Responsibilities

The main purpose of the ERAR is to check that the correct process for a **heightened** electrical risk assessment and completion of the ERAF has been followed.

The ERAR's countersignature of the ERAF does not remove any accountability from the ERAs.

The ERAR shall check the ERAF to confirm there is justification for:

- the ERAs' decision to select a particular ESSoW; and
- where relevant, the ERAs' decision to waive the site visit.

The ERAR shall check the ERAF to confirm that the:

- ESSoW is appropriate for the task and task delivery method; and
- ERAF lists any residual electrical hazards together with appropriate electrical risk control measures.

- **Electrical Risk approver (ERAp) removed, Electrical Risk Assessment Reviewer (ERAR) new duty**

# Single approach to Isolation – Multi-party earthed isolations

## Split into two sessions:

- This one to explain the Electrical Risk Assessment Form
- December – process for Multi-party earthed isolations

## Next time:

- Example of an Electrical Risk Assessment that has multiple parties involved.
- (Real world examples would be excellent to build from!)
  - Email any complex real-world examples to the SAI inbox ([ESDSAISupport@networkrail.co.uk](mailto:ESDSAISupport@networkrail.co.uk))

A stylized graphic of railway tracks on the left side of the slide, consisting of vertical bars connected by horizontal lines.

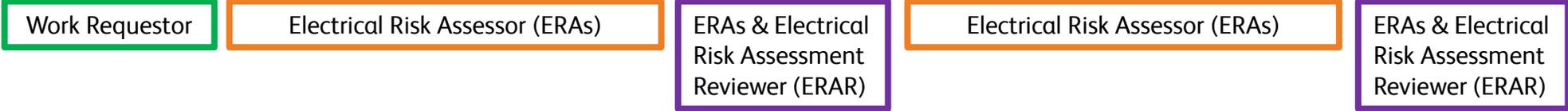
# The electrical risk assessment form (ERAF)

NR/L3/ELP/SAI25 Working on or near Overhead Line  
Equipment (SAI)

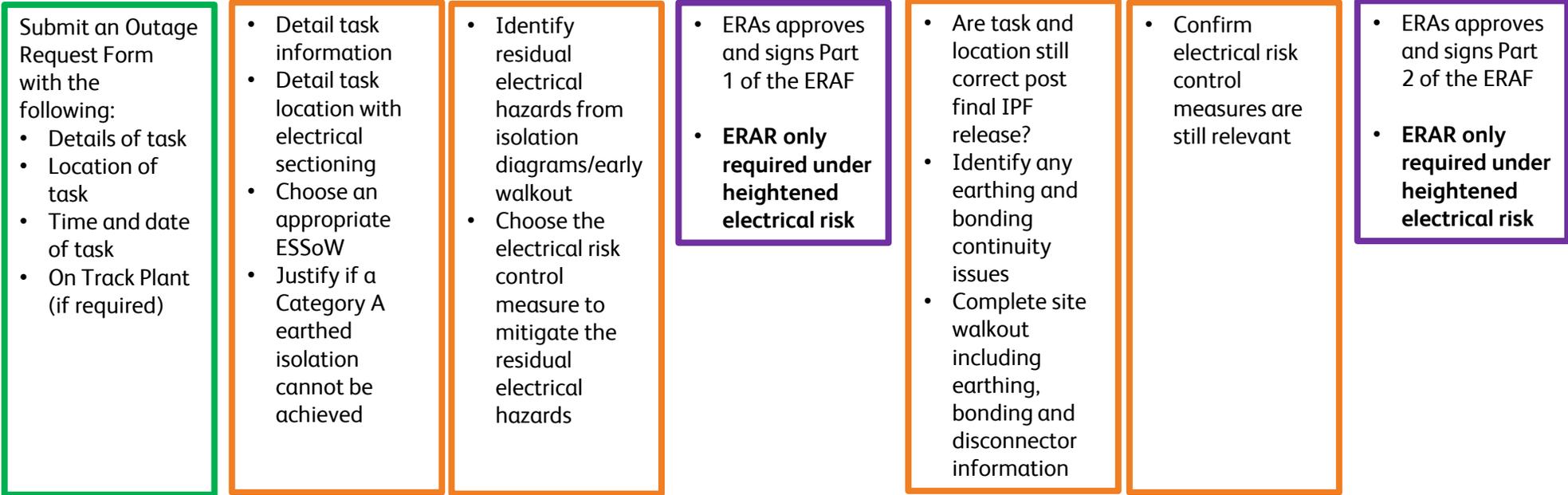
A stylized graphic of railway tracks on the right side of the slide, consisting of vertical bars connected by horizontal lines.

# ERAF process flow...Who? What? Where?

## Who?



## What?



## Where?



# ERAF part 1

## NETWORK RAIL ELECTRICAL RISK ASSESSMENT FORM

NR/L3/ELP/SAI25/ERAF Issue 02	Possession ref: POSS/EXAMPLE/01	Outage Request Form ref: ORF/EXAMPLE/01	Work site ref: SITE/EXAMPLE/01	Electrical Risk Assessment Form ref: ERAF/EXAMPLE/01	Revision 01
				If reused, include date from Part 2 of first use:	
<b>Part 1</b>					
<b>Part 1(a) – Work assessment and categorisation (To be completed by the Electrical Risk Assessor)</b>					
Work Requestor name:		Alex Rowley – Jack Partridge		Work Requestor contact number: 07986541236 - 07515210981	
<b>Details of Planned Work</b>					
Work start date and time:		06/11/2023 - 0001		Work end date and time: 06/11/2023 - 0500	
				Week Number:	40
Nature of planned task(s), task delivery method(s) and access requirements			(Note: Add references of relevant SSoW and other documents detailing the work to be carried out)		
OLE Maintenance works including Neutral Section maintenance, vegetation removal and OLE B10 maintenance. SRS access listed below. Drainage works involving extending drainage rods and poles.					
<b>Access and egress arrangements</b>					
On-tracking point(s)			Off-tracking point(s)		
G145/31 Whitmore MPATS RRAP			G147/33A Whitmore P.S.P RRAP		
<b>Electrical sections, lines affected and associated limits</b>					
Electrical section(s) required to implement the isolation(s)	Line(s) affected	Electrical section limits		OLP Along-track limits required	
		Limit structures:		From	To
		From	To	(Line, Structure Number)	(Line, Structure Number)
BW – 13A, 14A, 15A, 16A COMPLETE	Up Slow	G139/05	G150/11	Up+Down Fast G144/14	Up+Down Fast G147/52
BW-AF 7A, 8A COMPLETE	Down Slow	G139/05	G150/11	Up+Down Slow G144/14	Up+Down Slow G147/52
CW – 17A, 20A COMPLETE	Up Fast	G139/05	G150/11	Up+Down ATF G144/14	Up+Down Slow G145/30
CW – 18A, 19B	Down Fast	G139/05	G149/16		
	Up ATF	G139/05	G145/31		
	Down ATF	G139/05	G145/31		
Nominated Earthed Isolation provider: Network Rail Overhead Line					
Is this electrical risk assessment form part of a superseding Earthed Isolation?		(Y/N)	N	If yes, provide reference number of related Electrical Risk Assessment Form(s)	
				N/A	

### ERAF Part 1 Principles:

- Part 1 (first 4 pages) is completed as soon as a piece of work is required to be completed – before PPS (or equivalent) entry.
- Provide as much detail about the planned task(s) as possible – OLE maintenance is not enough detail.
- If there are on/off tracking points for machines, detail the access RRAPs
- Provide the proposed limits for overhead line permits and the electrical sections required to complete the task.

# ERAF part 1

## NETWORK RAIL ELECTRICAL RISK ASSESSMENT FORM

<b>Electrical Safe System of Work (ESSoW) Hierarchy and OTP traveling under Live</b>			
<i>NOTE: Where ESSOW Category L is used in conjunction with another ESSOW from the below hierarchy, the relevant area(s) shall be populated with 'N/A (ESSOW Cat L)'</i>	<b>RRAP (Y/N or N/A)</b>	<b>Travelling (Y/N or N/A)</b>	<b>Site of Work (Y/N or N/A)</b>
1. Can the task be reasonably completed using Category A?	Y	Y	Y
2. If the answer to Question 1 is 'No', can the task be reasonably completed using category B?	N/A	N/A	N/A
3. If the answer to Question 2 is 'No', can the task be reasonably completed using category D?	N/A	N/A	N/A
4. If the answer to Question 2 is 'No', can the task be reasonably completed using category E?			N/A
5. Will an OLP be issued to enable work on a return conductor with the corresponding OLE remaining Live in accordance with the requirements of NR/L3/ELP/SAI25 Module 7?			N/A
<b>If the answer to Question 4 or Question 5 is 'No', the task shall be re-planned.</b>			
<b>If the selected ESSoW category of work is B, D or E* for the 'RRAP', 'Travelling' and/or 'Site of Work', complete Part 1(b) to provide the supporting justification (* Only complete Part 1(b) if the task is not on the approved list of ESSoW category E tasks)</b>			
Is an Earthed Isolation required?		(Y/N)	Y
<b>Site visit and electrical risk assessment</b>			
Are any of the electrical sections subject to reduced wire height restrictions?		(Y/N)	N
Is a visit to site required to confirm any details of Part 1 of the Electrical Risk Assessment Form or to complete the electrical risk assessment in Appendix A?		(Y/N)	Y
Will a person with a detailed understanding of the work to be carried out accompany the ERAs on the walkout?		(Y/N) or N/A	Y
<i>(If No, provide confirmation below as to how the Electrical Risk Assessor will be able to appropriately consider the work content as part of the electrical risk assessment)</i>			
N/A			
<b>Complete the appended electrical risk assessment in draft in Appendix A, identifying the relevant residual electrical hazards and proposed Electrical Risk Control Measures</b>			
With the information available at this stage, can the work be completed safely with the selected ESSOW and proposed Electrical Risk Control Measures?		(Y/N)	Y
<i>(If No, the work will need to be re-planned and a different ESSoW shall be selected)</i>			

- At this stage, understand what is possible to receive as an earthed isolation from the following:
  - Route Isolation planner/meetings
  - Rules of the route
- Where possible, work in the safest possible electrical safe system of work (ESSoW), category A.
- ESSoW can be different for OTP at the RRAP and travelling locations.
- Appendix A must be completed in DRAFT for part 1.

# ERAF appendix A

## NETWORK RAIL ELECTRICAL RISK ASSESSMENT FORM

Appendix A - Electrical risk assessment (to be completed by the Electrical Risk Assessor)									
Risk assessment guidance									
1	Having selected the ESSoW category of Work that will be applied, identify all of the residual electrical hazards that remain. (Even when applying category A there could be still be the possibility that persons may accidentally stray out of the area covered by the OLP.) Please refer to NR/L3/ELP/SAI25 module 2 for more information.								
2	List the identified residual electrical hazards in the risk assessment schedule.								
3	If any risk level remains 'unacceptable', even with the proposed additional control in place, the work shall not proceed. The planning of the work shall be re-evaluated to facilitate delivery enabling a suitable level of risk mitigation.								
Scoring guidance									
How likely is it that compliance with the specified restrictions for the 2.75 m zone, Live zone will be achieved?									
<b>Likely</b>	There are <b>sufficient</b> controls in place to achieve this, and either all of them would need to fail, or a person would have to deliberately breach the controls						<b>Acceptable</b>		
<b>Unlikely</b>	There are <b>insufficient</b> controls in place to achieve this, and a simple misunderstanding, or a person experiencing a momentary distraction or lapse of attention could cause them to fail						<b>Unacceptable</b>		
Risk assessment									
Hazard ID	Residual Electrical Hazard				Electrical Risk Control Measure(s)	Inspection required? (Yes or No)	Notes (including the frequency of inspection where required)	Is the risk from this hazard acceptable	
	Description	Line	From / At	To				Yes	No
1	OLP Along-track limit	All Lines	G144/14		Aerial RoLE x6	No		✓	
2	OLP Along-track limit	All Lines	G147/52		Aerial RoLE x6	No		✓	
3									
4									
5									
6									
7									
8									
9									
10									
11									
12									
13									

- All OLP along track limits must be shown where RoLE is to be applied.
- All residual electrical hazards must be shown where electrical risk control measures are to be applied.
- You can have more than one electrical risk control measure per residual electrical hazard.
- The risk must be deemed acceptable by the ERAs if there is no ERAR reviewing; or
- by the ERAR if the ERAR reviews the document.

# ERAF part 1

## NETWORK RAIL ELECTRICAL RISK ASSESSMENT FORM

**Part 1(b) – Justification (To be completed by the Electrical Risk Assessor. Where relevant, Part 1(b) shall be completed to separately record the justification for the ESSoW at the Site of Work and the ESSoW for travelling to the Site Work) - (Complete for any ESSOW other than Category A)**

Justification Elements		RRAP (Y / N / N/A)	Travelling (Y / N / N/A)	Site of Work (Y / N / N/A)	Elements to consider
<b>Nature of the work</b>	Does the equipment need to be Live to complete the work?			N/A	- Testing for example: Section B74
<b>Economic impact</b>	Does a lack of all line Earthed Isolation opportunities prevent the work from being carried out under category A?	N/A	N/A	N/A	- Does the available access arrangements mean that it is not reasonable to schedule the work to allow completion under category A? - Is it unreasonable, or not possible, to postpone the work to allow completion when the access required to allow completion under Category A is available?  Note 1: In many cases, the lack of available infrastructure access and the inability to postpone the work until ESSoW Category A can be implemented, will form the basis of the justification case. Note 2: The ERAS can consult the Route Isolation Planner to confirm the available access arrangements if clarification is required. Note 3: It is important to demonstrate that consideration was given to confirming if it is possible to complete the work under ESSoW Category A within the available access arrangements and to record the justification where it is not deemed to be achievable within the available access arrangements.
<b>Safety impact</b>	Are the benefits of adopting ESSoW category A outweighed by the risks created through implementing an all line Earthed Isolation?	N/A	N/A	N/A	Workforce Safety for example: - Does ESSoW category A lead to more driving, more 'On or Near the Line' working and/or more manual handling?  Passenger Safety for example: - Overcrowding; - Public disorder/abusive behaviour towards workforce; - Public stranded on sealed trains etc.  Safety of wider infrastructure for example: - The non-availability of ESSoW category A within suitable timescales may reduce access times leading to increased risk of infrastructure failures, operational incidents and close calls etc. - The time taken to implement ESSoW category A may reduce access times leading to increased risk of infrastructure failures, operational incidents and close calls etc.
<b>Justification element</b>		<b>Justification and related detail</b>			
RRAP	N/A				
Travelling	N/A				
Site of Work	N/A				

### Electrical Risk Assessment Form Part 1 – Validation

Electrical Risk Assessor (ERAS)	Prepared by:	Sarah Morgan	If this ERAF is to be reviewed by an ERAR, select the reason below:	Electrical Risk Assessment Reviewer (ERAR)	Reviewed by:	Matthew Brown
	Signature:	Sarah Morgan			Signature:	Matthew Brown
	Sentinel number:	456987	None of the above - Request from ERAS		Sentinel number:	654789
	Date:	13/04/2023			Date:	13/04/2023

- Where Category A cannot be selected, a justification must be provided to work under any other ESSoW.
- Examples of justification are:
  - Nature of work: Category E – The OLE must remain live for section proving/testing after commissioning
  - Economic impact: Category B – Midweek night non disruptive access only can be provided (2 out of 4 roads).
  - Safety impact: Category D – To achieve a Category A, 4 miles of unnecessary earthing would have to be applied.
- The ERAF only needs to be signed by an ERAR when:
  - Category B – Work is encroaching 2.75m of live OLE
  - On/off tracking/travelling under live
  - Site visit being waived
  - Category E working – Not on the approved list
  - The ERAF is being reused
  - Request from the ERAs



# ERAF part 2

Part 2(b) – On/Off Tracking or/and Travelling under Live ((if applicable) to be completed by the Electrical Risk Assessor with support from the Work Requestor)							
Will there be any on/off tracking or travelling under Live? (If the answer is No continue to 2(c), If the answer is Yes complete 2(b))						(Y/N)	N
At the location for On-Tracking stated in 1(a) or 2(a), is the approach to track level?						(Y/N)	
At the location for Off-Tracking stated in 1(a) or 2(a), is the exit from track level?						(Y/N)	
What is the minimum wire height at the access? (mm)				Location (ELD, Mileage, OLE Structure Number)			
What is the minimum wire height through the distance travelling under LIVE? (mm)				Location (ELD, Mileage, OLE Structure Number)			
Machine Type	Machine Supplier	12 Digit Number	ECC reference	MLD (Y/N)	OTP Max Height (mm)	Standing Surface Max Height (mm)	Comments
Lines Affected	ELR	Start Mileage	End Mileage	Start OLE Structure	End OLE Structure	Additional Landmark Concerns	
Electrification and Plant Maintenance Engineer or Delegated Authority: I confirm that I have reviewed and approve the on/off tracking and/or travelling activities stated above.							
Endorsed by:		Signature:		Sentinel number:		Date:	
Part 2(c) – Electrical Safety Document details (to be completed by the Electrical Risk Assessor)							
COSS (OLP) Name	Line(s) / ATF / RC	OLP along-track limit structures:		Issue at Site of Work?	Work content		
		From	To				
A Rowley	Up+Down Fast and Slow	Q144/14	Q147/52	N	OLE Maintenance		
	Up+Down ATF	Q144/14	Q145/30				
J Partridge	Up+Down Fast and Slow	Q146/33	Q147/52	N	Drainage Works		
Site of Work details (Description of the Site of Work, Site of Work boundaries including vertical boundary)							
Category A, All lines isolated and earthed including ATF and RC. No Residual electrical hazards. OLP limits listed above in 2(c).							

- Part 2(b) only completed where on/off tracking/travelling under live is to take place.
  - Must be signed off by the E&PME.
- Part 2(c) must be completed with all overhead line permits (OLP) planned to be issued. There is a continuation sheet for this section.
- An OLP to be issued at the site of work is up to the ERAs' discretion.
  - Complexity of the earthed isolation
  - How close the OLP is working to residual electrical hazards
  - Etc.

# ERAF part 2

## NETWORK RAIL ELECTRICAL RISK ASSESSMENT FORM

Part 2(d) – Confirmed Electrical Risk Control Measures			
<i>Finalise and record risks and associated Electrical Risk Control Measures in appended risk assessment, append the referenced generic risk assessment or existing risk assessment</i>			
Are the required Electrical Risk Control Measures identified and recorded in the appended Electrical Risk Control Measures Appendix A?	(Y/N)	Y	
Are drawings, diagrams or sketches included as part of this electrical risk assessment?	(Y/N)	N	
Is there a requirement to inspect the Electrical Risk Control Measures? If 'Yes', provide the details in the Electrical Risk Control Measures table in Appendix A. If 'No, provide justification below:	(Y/N)	N	
<i>Devices checked prior to application and usage length is less than 12 hours.</i>			
Will the integrity and continuity of existing electrical circuits, including bonding, be affected by the planned tasks? <i>If Yes, describe the measures to be taken to mitigate the hazards in accordance with the requirements of NR/L3/ELP/21085:</i>	(Y/N or N/A)	N	
Has the visit to site been waived by the Electrical Risk Assessment Reviewer? A waiver is not required for ESSoW category A work. If Yes, provide relevant details below: <i>(include the name of the reviewer, date of the waiver and factors to justify the waiver)</i>			
		(Y/N or N/A)	N
<b>NOTE:</b> <i>A site visit shall not be waived for On-Track Plant activities as specified in NR/L2/RMVP/0200/P501.</i>			
<i>ESSoW is a Category A. NP will visit site to confirm the DEP locations and Bonding is intact.</i>			
Can the work be completed safely with the proposed Electrical Risk Control Measures in place? (If No, detail below the action required to replan the Earthed Isolation)	(Y/N)	Y	
Electrical Risk Assessment Form Part 2 – Validation			
Prepared and approved for use by:		Reviewed by:	
Sarah Morgan		Matthew Brown	
Electrical Risk Assessor (ERAS)	Signature:	If this ERAF is to be reviewed by an ERAR, select the reason below:  None of the above - Request from ERAS	Signature:
	Sentinel number:		Matthew Brown
	Date:		654789
	01/11/2023		01/11/2023

- Confirmation of appendix A to check the DRAFT in part 1 is still correct.
- Earthing and bonding must be considered as part of the electrical risk assessment.
- Waiving a site visit justification must be agreed by the ERAR.
- Technology can be used when waiving the site visit however, it is the ERAs' responsibility to ensure the data is current and correct.
- Where a short notice earthed isolation occurs – An ERAS and ERAR should use the guide questions shown.

Short notice Earthed Isolations: Guide questions	
This section shall be completed for short notice Earthed Isolations in accordance with the requirements of NR/L3/ELP/SAI25 module 2	(Y/N)
Has the appropriate Electrical Safe System of Work been selected from the hierarchy in accordance with the requirements of NR/L3/ELP/SAI25 module 2?	
Have all electrical hazards and residual electrical hazard been identified?	
Are the Electrical Risk Control Measures identified suitable and sufficient?	
Are the necessary competences and resources available to complete the task(s) required?	

# ERAF appendix B



Appendix B - Relevant information for the site walkout							
Completion of Appendix B is not a requirement for the authorisation of the Electrical Risk Assessment Form							
DEP Details							
Structure number	Line(s)	OLE (CME/AE/CJ)	RC (AE)	ATF (CME/AE/CJ)	EAP intact	DEP bond Intact	Comments
Q144/4	Up + Down Fast, Slow and ATF	CME		CME	Y	Y	
Q145/30	Up + Down Fast, Slow and ATF	AE			Y	Y	
Q145/33	Up + Down Fast, Slow and ATF N/S	CJ		CME	Y	Y	
Q146/01	Up + Down Fast, Slow and RC	CME	2 X AE		Y	Y	
Q147/17	Up + Down Fast, Slow and RC	AE	AE		Y	Y	
Q147/52	Up + Down Fast, Slow and RC	CME	2 X AE		Y	Y	
Bonding affected by the works							
Structure number	Line(s)	Description					
Manual lineside Disconnectors to be operated							
Disconnector designation	Structure number	Line	Open / Close / Alternate / Earth	Key type and location	Access / location		

- Not required for the electrical risk assessment, however advised.

## Next Steps

- The next three scheduled calls are;
  - 7 December - Part 2 of Multi-party earthed isolations
  - 18 January
  - 29 February
- Are there any hot topics you would like to share?
  - Email [ESDSAIsupport@networkrail.co.uk](mailto:ESDSAIsupport@networkrail.co.uk)