

THE HISTORY OF

RAIL ELECTRIFICATION

Courtesy of power quality specialist

REO

1883

Magnus Volk opens the first electric railway, Volk's Electric Railway, in Brighton. It stretches a quarter mile and is powered at 50v DC.

1884

Volk's Line is extended a further half a mile.

1890

The London Underground begins operating electric services on a fourth rail system on the South London Railway. It is the world's first deep-level electric railway.

Early 1900s

Work begins on main line electrification in some suburban areas.

1920

The Electrification of Railways Advisory Committee (ERAC) is formed and holds its first meeting.

1921

The ERAC chooses 1500 V DC overhead as the national standard. However little is done to implement this.

1948

Railways become nationalised. Electrification is expanded at both 1500 V DC overhead and 660/750 V third rail.

1956

25 kV AC overhead becomes the standard for all rail projects that aren't third rail extensions.

1993

The Railways Act 1993 is introduced, privatising railways but also putting tighter regulation on power quality and voltage stability.

2007

UK government rules out large-scale electrification for the following five years...

2009

...but two years later Network Rail launch a consultation into large-scale rail electrification.

2011

Conversion begins on third rail systems to turn them into overheads.

2015

Tests begin of the European Rail Traffic Management System, a new computer-controlled signalling system which may increase the risk of harmonic issues.

2017

Electrification of the great western main line is scheduled to be completed.

2033

HS2 is set to be launched.

1902

The Underground Electric Railway Company of London (the Underground Group) is formed.

1905

District and Circle lines are electrified.

1908

The famous roundel symbol appears. Electric ticket machines are introduced.

1933

All tube train doors are now air-operated and no longer manual.

1952

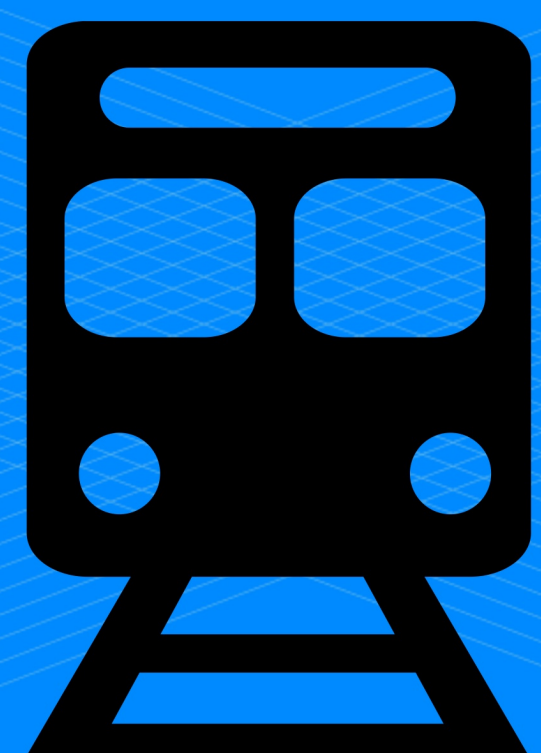
The first aluminium train enters service on the district line.

1961

The end of steam locomotive haulage of passenger trains.



TYPES OF RAIL ELECTRIFICATION



OVERHEAD LINES

The most common form of electrical transmission in rail.

Current is carried through the overhead wires which flows into trains through current collectors situated on top.

As rail requires a stable current to operate safely, it is vital that insulators, transformers and support structures are effective and properly maintained.



THIRD RAIL

Less commonly used than overhead wires.

Capable of providing power up to 1200 V using only DC distribution.

The third rail is more compact than overhead wires but can pose more of a risk to health and safety depending on rail placement.

It's important they are properly maintained to avoid disruptions and hazards.



FOURTH RAIL

Not very commonly used, with only a few network usages including the London Underground.

The extra rail carries the electrical return, meaning that the running rails don't carry any current.

In the underground this reduces the risk of current leak to surrounding water and gas mains.

REO

For reliable rail power, visit www.reo.co.uk/transport