ELECTRIFICATION OF THE GREAT WESTERN RAILWAY.
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The idea to electrify the Great Western Railway was a political gesture. The Department for Transport was given the task of funding it and seeing it completed. The execution of the task was asigned to Network Rail, working through contractors.
The Objective was to shorten the journey time from Bristol to Paddington by 18 minutes, additionally by having faster trains, greater line capacity could be achieved and by lengthening the trains and making them run by electricity rather than diesel, greater seating capacity could be achieved as well as less pollution and less C02 emissions were realised.
The plan was to extend the trains to Cardiff (end of 2019), Oxford and Newbury.
On completion, three Asset Heads would "own" the railway. One for signalling, one for track and one for the electrical infrastructure. The speaker's role was as a sponsor for Department for Transport to the 3 asset heads, while being employed by Network Rail.

On embarking on the project, mammoth problems were soon discovered. Bristol acted as a nidus for many of these. The track and signalling in East Bristol were antiquated. Extinct freight marshalling yards still fed onto the mainline through points resulting in speed restrictions. The signalling was of a similar age and was in need of replacing. There was a need to quadruple the tracks from Bristol Temple Meads up Filton Bank towards Parkway to cope with the increased traffic demand and a new platform needed to be constructed at Parkway. In addition to this, the line needed to be electrified.
Simply electrifying the line carried its own problems. The work had to be done while trains were running, which was unacceptable on safety grounds, so work had to be done at night, giving only 5 hours actual work, or possession had to be taken of a length of line for a period of time. This caused great inconvenience to passengers, freight operators, people using bridges, people who lived near the line and anyone who passed cables, crossings or water or services passing below the railway. Placing the gantries could prove difficult if the ground into which they were inserted differed. There was a mixture of clay, grouted embankments and bedrock to contend with.

Bridges posed problems with English Heritage demanding certain bridges be untouched. this necessitated lowering the track, which caused its own problems with profiling the track if near a station or junction. Similarly raised bridges had to be profiled which could lead to the road coming half way up someone's front door. Tunnels posed another problem. Box tunnel has 8 different species of bat living in its roof, all of which had to be considered when working in the tunnel. In addition to this a river was discovered one metre below the eatern portal, which required divers to survey.
Many lowered tracks fell below the drainage levels for the overall permanent way and this had to be dealt with.
The moving parts of the system were also found to be problematical. A pantograph with carbon pick ups, contacts the round copper wire about 5 mm in diameter to transfer the current. The pressure of the wire on the pantograph was crucial and this was achieved by downdrop wires between the catenary and the pick up wire about evey metre. The length of these downdrop wires was different and crucial for the tension and pressure of the system. Despite this, the circular nature of the wire meant a pressure point on the pantograph until the wire developed "a flat". This shotened the life of the pantograph from its 8 week spec.

A decision was made that there was no immediate advantage to electrifying the line from Swindon to Bristol through Bath. This then necessitated the production of dual-traction (electro-diesel) five coach units. This then in turn put extra pressure on the maintenance depots to maintain a fleet of electro disel units and meant that there was extra energy expended in carrying diesel electric motors and the fuel to run them.
The final stage of the process is to commission the track and hand it over to the Asset Heads. This sounds a lot easier than it is in practice. So far, the railway is on schedule, Currently the line is electrified form Paddington to Didcot. This will be extended to just short of Swindon on October 21st this year and to Bristol by April 2019 and Cardiff by the end of 2019.
Many questions were asked throughout the presentation which was greatly enjoyed by those present.