Office of Rail Regulation Independent Reporter Services (Part C) Part C Reporter Mandate CN/016 North West Electrification - Efficiency and Deliverability Review for GRIP 4-8 Final Report







# Executive summary

The Office of Rail Regulation (ORR) asked the Independent Reporter (Part C), hereafter referred to as the Reporter, to undertake an efficiency and deliverability review of the main works of the North West Electrification Programme (NWE) Phase 1 GRIP 4-8 to determine whether the programme is deliverable within the committed timescales and current cost estimates.

Phase 1 of the North West Electrification scheme comprises the introduction of 25kV AC Overhead Line Equipment (OLE), and associated distribution and infrastructure works, to the east section of the Liverpool to Manchester route from Castlefield Junction to Newton-Le-Willows. The review investigated the development of the outputs, system integration, deliverability and cost. During the review process, core project documentation was reviewed and interviews were conducted with key personnel involved with the programme.

## Scope of the review

We examined outputs and systems integration to determine if the options being considered and developed are appropriate in terms of safety, performance, reliability and sustainability requirements and they represent a whole life, whole system approach.

We investigated deliverability to determine whether the programme can be delivered efficiently in the required timescales.

We looked at the estimated costs to understand if they are of the right order and that there is a credible process to ensure cost estimates are robust.

# **Key findings**

#### Outputs and systems integration

We have found good evidence that Network Rail has adequately managed the development of the outputs from the start of the GRIP 4 process to the present time and that the System Integration Management Plan (SIMP) is being used to efficiently to ensure the delivery of the required outputs of the NWE Programme on



the whole. For Phase 1, Network Rail needs to tailor the SIMP to address the specific requirements of the project.

The Project Requirements Specification (PRS) for NWE programme was developed by the Network Rail Sponsor and Head of Electrification. For Phase 1, option selection was achieved during GRIP 3. During GRIP 4, the PRS was translated into outline designs (Form As), and more prescriptively into detailed technical workscopes to enable procurement activity. There is evidence in the stage gate report that performance, reliability, sustainability, a whole life and whole system approach were considered. This stage gate review also sought to address concerns raised in the ORR improvement notice that operational safety was not considered during the early design phase.

The existing NWE PRS focuses on provision of 25 kV AC electrification on four routes across North West England. Whilst there is no train service outputs in the remit, a train service specification was provided for the purposes of designing power supplies. The OLE will be the first application of the new Network Rail Series 2 design, which is being developed with 100 mph capability. However, the NWE programme is not remitted directly to incorporate infrastructure works to increase line speeds.

There is good evidence that Network Rail is developing the SIMP that describes a comprehensive approach to managing whole system outputs for the NWE programme, including the integration of infrastructure with anticipated train service requirements and other projects. Whilst the outputs of these interfaces are not yet defined, there is a risk of disruption to the NWE Programme. The project team are monitoring developments closely and are well placed to respond to any new requirements.

A key consideration for the programme is the type of rolling stock to be used. The availability of new stock, cascade of existing stock and changes through Train Operating Company (TOC) franchises all introduce uncertainty that will leave issues, such as EMC to be resolved later when the rolling stock is defined by the Department for Transport (DfT). During GRIP 3 and 4, the Major Feeding Diagram for NWE Phase 1 was developed, through modelling of the assumed train service provision, amongst other factors. The power requirements for NWE Phase 1 were checked, and found compatible, with those for the Northern Hub Phase One together with some anticipated extra services on Transpennine routes.

#### Deliverability

There is good evidence that the project scope and requirements are comprehended by the delivery team and they have developed an efficient and robust programme to deliver the scheme in the required timescales.

The programme schedule has been developed by the Network Rail's delivery team based in Manchester. The schedule has been tested through the pre-qualification process and experience supplemented by tender action and compared to contractors' tender returns. There is a strong correlation between the



tender returns and Network Rail's proposed programme, suggesting Network Rail's original programme estimate and productivity assumptions were efficient.

The construction schedule is predominantly governed by the possession strategy to allow track access for the installation of OLE. The possession strategy was developed through industry wide consultation, with TOCs, Freight Operating Companies (FOCs) and the Infrastructure Maintainer that agreed to maximise week night possessions by using extended rules of the route possessions. This level of regular and meaningful stakeholder engagement and collaborative working has resulted substantial benefits to the project.

The use of extended week night possessions is an efficient method of working on the railway that has the benefit of allowing contractors time to refine their construction techniques and have the opportunity to develop staff competencies in an environment that may not exist in pressurised weekend blockades, all of which is to the benefit of the programme and industry.

#### Costs

We found good evidence that the estimated costs are of the right order and that there is a credible process to ensure costs estimates are robust. All of the cost estimates and tender cost information for Phase 1 of the NWE Programme were reviewed at a high level and considered to be appropriate.

In reviewing the methodology adopted in building the estimate, including compliance with GRIP guidelines for estimating we found good evidence that the NWE Phase 1 estimate has been built up on a traditional labour, plant and material basis. Costs for components were sought from suppliers and where received incorporated into the estimate. Traditional methodology was used for construction of elements of the work. Appropriate past estimate and out-turn costs appear to have been the basis of many elements. Elsewhere, Network Rail database rates were used.

The procurement strategy work packages for Phase 1 have been determined by the necessity to provide the designated train service by December 2013. Thus, long-lead items have been ordered before the whole project has been fully designed and construction methodology finalised. In the current market this may not have impacted on the cost but future packages need to be more integrated to obtain the best economic result. We therefore consider there is good evidence that the procurement and contracting proposals are likely to achieve an efficient outcome.

Once the long lead items were ordered this left the remaining two elements to be procured at a later date. The strategy adopted was to split the "on track" installation of the OLE and signalling systems and the "off track" installation of the power and distribution equipment into separate packages. These packages will reduce the interface risk, maintain the programme and support delivery in achieving the requirements of the programme.



## Conclusions

The NWE programme GRIP 4-8 review has concluded that Network Rail's proposals for the main works for phase 1 of the NWE programme are deliverable within committed timescales and the current estimated costs are efficient. We have found evidence of good practice within Network Rail, measured in terms of efficient governance, cost control, programme and project delivery.

### **Recommendations**

- 1. We recommend that the application of the SIMP process to the NWE programme and Phase 1 in particular is reviewed. It is recommended that further description is included to explain how assurances will be achieved through the application of standard Network Rail processes and procedures.
- 2. We recommend that in future projects, the finalised PRS for GRIP 4-8 is prepared for the start of GRIP 4 so that any unnecessary downstream change can be minimised.
- 3. We recommend that during the development phase of a scheme specialist technical resources are identified and their availability planned in a similar way to that which is undertaken for scarce resources required for project implementation.
- 4. We recommend that for future schemes, Network Rail combining the provision and installation of the power distribution equipment into a single package.
- 5. We recommend that in procuring future OLE projects all disciplines within the schemes are developed to GRIP 3 and Network Rail consider early contractor engagementduring the GRIP 4 process to maximise single option design which may secure a more efficient delivery process.
- 6. We recommend that Network Rail establishes and maintains a benchmarking and cost capture plan for electrification development and construction work that can be used to help plan, deliver and demonstrate the improved efficiency of future schemes.
- 7. We recommend that NWE programme share the key findings and lessons learnt from their estimating and contracting works with other electrification schemes, most notably for the benefit of the Great Western Electrification programme team.
- 8. We recommend that Network Rail reviews how it can maximise their bulk buying potential of OLE components.

The Nichols Group 53 Davies Street London W1K 5JH Tel: 020 7292 7000 e-mail: info@nichols.uk.com www.nicholsgroup.co.uk



