NR/L2/SIG/30097/AppH
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Appendix H, *GRIP Stages 1 and 3 – Feasibility assessment and requirements analysis*

Network Rail guidance

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1 Introduction

1.1 Background

The concept of Modular Signalling has been adopted and developed within Network Rail to introduce new products and changes in the implementation of signalling projects in order to bring about significant cost savings.

1.2 Purpose

This guidance document sets out the documentation and activities that should be carried out the first two stages in the development process to deploy the Modular Signalling system on a route, together with early enabling works to help meet the target of a 24-month project duration. Although the document contains guidance, the process described is approved best practice.

There is no equivalent to GRIP Stage 2 as Modular Signalling is deployed on a like-for-like basis, without providing any enhancement to the existing railway. There are no technology choices to make. As a result, there are no options to identify for evaluation in later development stages.

Other sections of the Modular Signalling Handbook set out the technical standards, constraints, components and applications which form the Modular Signalling system. In particular, the main section of the Handbook defines the constraints within which the Modular Signalling system should be applied.

Exceedance of any of the constraints is possible but should be made in the understanding that to do so will incur a cost increase possibly disproportionate to the degree of exceedance. This is due to the standardised, templated and automated processes becoming unusable by the deviation from the normal scope of supply.

This document also sets out the documentation and activities which make up the next stage in the project development process – Requirements Analysis (GRIP 3) Once deployment of the Modular Signalling system has been approved, this stage provides initial demonstrations of the new signalling arrangements for consultation with stakeholders.

It also provides further information on the route to improve the cost and programme estimates.

Templated programmes have been prepared for the various GRIP Stages.

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1.3 Scope

This document should apply to any resignalling scheme that has been designated a “Modular Signalling scheme” by the Professional Head [S&T] Engineering and the Head of Operations Development. Such schemes will make use of Modular Signalling principles, technology and processes which are fundamentally different from those used for a conventional resignalling scheme undertaken by Network Rail.

1.4 Definitions

Definitions are contained in the main section of the Modular Signalling Handbook.

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2 Pre-GRIP – Business Planning

The starting point for the development of a scheme using the Modular Signalling system is the initial entry onto the Business Plan, which is made with an initial assessment that the operational requirements for the route in question fall within the constraints of the Modular Signalling system.

To take the project forward the Sponsor should make the initial population of the Project Requirements Specification to act as the Client Remit to the Project Development Manager.

2.1 Enabling works programme

To assist in achieving a 24-month project duration from development to commissioning, a programme of enabling works should be set up to give an early start to certain activities which either have a long lead time or a long duration or both.

It is accepted that this work may be abortive if the scheme does not go forward into development or delivery.

2.1.1 Video Signalling Asset Survey and Asset Data Collection

Production of the scheme plan should use the ISP-Scheme tool. To capture details of the existing infrastructure assets and positions to form the base signalling plan a video signalling asset survey should be carried out.

This requires early planning to arrange for the Network Rail Track Recording Unit to traverse the route concerned, recording high definition video film to allow the asset survey. This can typically take up to 3 months to arrange.

The Signalling Tools Asset Surveys section of the STAMP Website shows the process for arranging the TRU run and for contracting with Omnicom Engineering, currently the only supplier of this service, for filming and asset capture.

http://oc.hiav.networkrail.co.uk/programmes/stamp/Pages/Default.aspx

Prior to filming, it is important to decide on a datum point, from which all equipment and feature positions will be calculated and referenced. Ideally, the datum point should be the corner of a building or structure outside the area affected by the proposed project works. Failing this, the tips of a set of points similarly clear of the works can be used instead.

Once the base plan has been prepared, all dimensions are referenced from the nearest quarter milepost, itself dimensioned by reference to the original datum point – the significance of the datum is thus short lived.

Once the filming has been done. asset capture can be carried out using the OS3D HD Kiosk, either by Network Rail staff or by Omnicom Engineering. This typically takes 1 man week per 8 miles of route.

If the data capture work is carried out by Omnicom Engineering, quality control checks on the profiling work should be carried out to achieve accuracy. It is

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recommended that regular visits are made to their premises together with email correspondence to assist in identifying any pieces of equipment they are unfamiliar with. A suitable checking process should be followed if the data capture work is carried out by Network Rail staff.

Omnicom Engineering will need to be supplied with uncontrolled copies of existing signalling plans to assist in asset identification.

2.1.2 Level crossing closures

It is important that the level crossings on the route are assessed as early as possible to identify any that can be closed. By doing this assessment in advance, the lengthy closure process can, where possible, be started and the scope of the resignalling project set to include appropriate works at these crossings – e.g. retention of gates and a Crossing Keeper for the period until closure can be achieved rather than provision of an MCB-OD crossing installation.

2.1.3 Level crossing – Method of protection

The method of protection of all level crossings should be reviewed. In particular, AHB crossings should be assessed to identify if this level of protection remains adequate or if they need to be upgraded to MCB-OD status.

Assessment of possible conversion of a crossing to AHB protection or similar should not be carried out because this will delay the deployment of Modular Signalling and the operational cost savings to be gained from the work. The preferred option, where a change in level crossing protection is required, is to provide an MCB-OD type.

Very exceptionally, a gated crossing operated by Network Rail staff might be converted to become a User Worked Crossing. Such crossings are likely to be away from the immediate vicinity of a signal box, operated in liaison with the local signaller and manned in the absence of previous investment to remove the staff presence. Conversion to UWC status will require considerable assessment effort. The physical work will be relatively minor and so need not be considered at this stage.

Exceptionally, the workload assessment described in **2.1.7** may identify a need to reduce Signaller workload by conversion of User Worked Crossings to Enhanced UWC status by provision of Miniature Stop Lights.

2.1.4 Level crossing topographic surveys

Topographic and buried services surveys are needed for any crossing where the external crossing equipment, e.g. gates, barriers, is to be renewed. If the majority of the equipment is to be retained and only minor alterations made, then the existing Level Crossing Ground Plan should be amended to show the alteration.

The scope for this survey is set out in Work Instructions contained within the Network Rail Signalling Design Group Quality Management System and should be followed by any organisation carrying out this work**.**

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2.1.5 Level crossing usage censuses

Where significant changes are required to the external equipment such that the works are considered equivalent to a full level crossing renewal, crossing usage information is needed for part of the level crossing design process.

This information is required in order to determine footpath widths over the crossing and the size and position of certain road markings.

The scope for this survey is set out in Work Instructions contained within the Network Rail Signalling Design Group Quality Management System and should be followed by any organisation carrying out this work.

2.1.6 Level crossing ground plans

Whilst nominally a GRIP Stage 4 product, preparation of these plans, up to a “Consultation” level of detail should commence as soon as survey data is available. They should be prepared in accordance with normal practice and guidance published elsewhere.

2.1.7 Ergonomics

Initial assessments of workload and the proposed site of the Signaller’s workstation(s) should be carried out during this period, following the process set out in Appendix D1.

This will confirm the number of staff needed to operate the proposed area of resignalling and identify and identify any abnormal costs or constraints associated with the control centre site.

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3 GRIP Stage 1 – Feasibility assessment

This activity confirms the original Go / No Go assessment of the suitability of the Modular Signalling system to a particular route as shown in the Business Plan. It is not expected that a time period of more than 4 weeks will be necessary to carry out the necessary investigations and complete the required products, provided dedicated resources are deployed.

At the end of the activity, a Stage Gate review with the signatories to the Project Requirements Specification will confirm approval to move forward to the next stage in the development process, Requirements Analysis. The products required for the Stage Gate review are described in the following sections. It is anticipated that these activities will require only input from a Project Development Manager and a reasonably experienced Signalling Engineer.

3.1 Project requirements specification

This document is combined with the remit to the Project Manager. It takes the form of a template which, after completion by the Sponsor or Sponsor's Agent and issue to the Project Development Manager, defines in more detail the scope of the project against which the Business Plan estimates of cost and programme can be compared.

This document forms the technical specification for the project.

3.2 Asset condition assessment

This information is gathered by a desktop study of the condition of the key existing infrastructure assets which are to be retained and reused as part of the deployment of Modular Signalling. The purpose of the report is to identify any significant costs which will be associated with continued use of the asset, and which may have an impact on the cost viability of deploying Modular Signalling on the route.

The study should be undertaken from existing condition reports already in the possession of the relevant asset manager and, if necessary, from enquiry to the FTN project organisation.

The areas to be covered are as follows.

3.2.1 FTN availability

The Modular Signalling system is dependant on the use of the FTN transmission system and early confirmation of the availability of transmission paths, in a ring for reliability, along the proposed route is a key enabler. Availability should be noted as either "now" or to a realistic timescale that matches the planned project programme.

At this initial stage, confirmation of the presence of FTN infrastructure is adequate. Assessment of the work required to configure the network to suit the specific interface needs of the Modular Signalling equipment can be left until later stages.

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3.2.2 Fringe signal boxes

A desktop study of the condition of the fringe signal boxes to give confidence that the implementation of the fringe signalling arrangements can be carried out successfully. The design of the fringe signalling arrangements is unlikely to be a major cost driver within the overall project cost. However/ it can have a significant impact on timescales and possession needs.

Condition can be gauged from the most recent Signalling Infrastructure Condition Assessment (SICA) report and the register of known deficiencies. Note that a Modular Signalling project will not carry out remedial works to overcome existing condition shortfalls unless strictly needed for the fringe works.

Correlation work at fringe signal boxes is limited to the altered circuits only. If the Asset Manager requires correlation beyond this level, the scope of the additional work can be identified and priced outside of the Modular Signalling SEU rate.

3.2.3 Level crossings

3.2.3.1 General

To reduce the development time of the resignalling scheme to a minimum, surveys and investigations into possible closure of a crossing or construction of a bridge are carried out in advance of the start of the GRIP process. In this GRIP Stage 1 the activity is to better identify the costs of the level crossing works.

3.2.3.2 Complex level crossings

Where the strike ins of adjacent level crossings overlap, or different types of level crossings are interlaced, the complexity of the design will be greater than normal and so a non-SEU cost may be incurred above the normal rate for provision of a level crossing.

3.2.3.3 Manually-controlled level crossings

The most recent SICA report for any crossings where all or some of the existing installation may be proposed for retention should be reviewed to gauge the impact on the cost of the works. The report will give a view on age and condition of the equipment currently in use.

Where an existing gated crossing is to become an MCB-OD then full renewal should be carried out.

Where the crossing is currently an MCB, operated either locally or remotely by CCTV, an assessment is necessary to determine the work required to convert to MCB-OD by provision of Obstacle Detector equipment. No additional work (e.g. to barriers or road lights) should be necessary unless the crossing is already scheduled for full or partial renewal. It is expected that full renewal of the controls will be the most effective solution rather than alteration of the existing controls.

The new ground plan or (if not complete at this stage) the existing ground plan (where available) and information available from the “Marlin” geographic information

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