Initial Project Specification
Project: Aberdeen to Inverness Rail Improvement

Project Name: Aberdeen to Inverness Rail Improvement	Business Unit:
Sponsor: Grace Heath	PIPS reference:
Project Manager: Lynne Docherty	OP/PMCS number:
Client: Transport Scotland	

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Issue	Date	Produced by	Comments
1.0	1st Oct. 2010	J. Alexander	Initial Issue.

1 Purpose

The Aberdeen to Inverness route is primarily single track with passing loops. This type of infrastructure is restrictive toward increasing traffic demands due to the requirement to pass trains at small loops not necessarily in their optimum position. The current journey times and irregular services do not provide an attractive alternative to road travel and therefore fail to encourage a modal shift toward rail. This does not support Transport Scotland's aspirations for future timetable and performance enhancements that will help promote sustainable economic growth throughout Scotland. This document describes the high level proposals for the Aberdeen to Inverness Rail Improvement project.

2 Project Scope and Definition

The project remit is to deliver a robust timetable that will allow an hourly service between Aberdeen and Inverness with a journey time of 2 hours. This timetable is also required to deliver intermediate half hourly services between Aberdeen and Inverurie and also Inverness and Elgin. The intention is to provide this timetable with a more regularised train pattern. The journey time requirement should also allow for new station stops which may also be built at Dalcross and Kintore as part of the project.

The project is required to propose and ascertain the optimum railway infrastructure on the line of route that can deliver the timetable and station stop requirements. With these objectives in mind the project has decided to timetable model several layout options throughout the route to demonstrate the most efficient solution in terms of where infrastructure changes must be provided. These changes may include double lining, loop extensions as well as the provision of new loops and shall also take cognisance of the new stations that are being considered. Elimination of cumbersome token exchange delays and other sources of delay within the operation of the existing signalling systems shall also be targeted as a key area where the required journey time improvement can be delivered.

The construction of the project where feasible, will minimise disruption to Signallers, Train Drivers, Station Platform Staff, TOC's, Travelling Public and Members of the Public. The project shall maintain current network capability with respect to the provision of train paths over and above the regular passenger services on the route (i.e. freight and charter traffic).

The aim of the project is to ensure the route can achieve the declared timetable aspirations by 2016.

3 Related Works

Existing Primary SICA surveys for each control area have revealed that the Interlockings have sufficient life left within them to sustain the new project aspirations. The majority of installations are classified as Green Plus which have a live expectancy of over 20 years. Insch, Kennethmont and Huntly are classified as Green with a life expectancy of 18 years although these assessments were carried out in 2006. The next assessment date for these signalboxes is due during 2011 however the category of classification is unlikely to change significantly.

Track alterations shall be required within the project area to provide the new and extended loop arrangements as identified through timetable modelling undertakings. Initial findings are that these alterations shall be required in the Dalcross/Nairn and Forres areas. Track

alterations shall also be required between Inverurie and Aberdeen and/or Inverurie and Insch. Alterations may be required at Keith to extend existing loop although this requirement will be dependent on the station dwell time and whether trains shall pass at this station or at Huntly.

New station construction shall take place at Dalcross and Kintore with new platform requirements at Forres.

There are a number of bridges on the route. Depending on the final positioning of the loops, these bridges will have to be assessed to see if they require any modifications.

FTN and GSM-R requires to be fully operational throughout the route to allow the use of modern technologies such as the provision of axle counters.

The full extent of telecoms requirements has still to be identified, but it is proposed that signalling data is transmitted using new FTN equipment, and suitable provision must be made within the FTN system to accommodate the new data.

Close interdisciplinary ties need to be established and maintained throughout the course of this project.

4 Specific Signalling Proposal

4.1 Control Centre Technology

Control Centre strategy in the medium term is to move toward Inverness SC controlling as far as Elgin (inclusive) and Aberdeen SB controlling toward Keith (inclusive). The control strategy is linked with the projected local service provision at each end of the route.
For the purposes of this project it is envisaged that this shall involve the following:

- Inverness control area shall extend to encompass the new Dalcross loop / station arrangements.
- Forres SB area shall be extended in line with any proposed loop extension and shall also incorporate Axle Counter Equipment required to replace the key token sections to the adjacent signalboxes. A new interlocking may be a requirement at Forres depending on the extent of alterations deemed necessary as the development progresses. The existing space in Inverness Signalling Centre could be utilised for this purpose. In this scenario Inverness would pass control to Nairn for eastbound movements and receive control again of such movements beyond Nairn.
- Elgin SB may require signalling alterations to facilitate a stabling capability as part of the turnback. This will be dependent on the dwell time of the turnback trains.
- Keith SB shall have minor signalling alterations to extend the loop arrangements through the station area. Alterations may become more extensive though in the event it becomes necessary to realign the track in the vicinity of the signal box.
- Insch SB shall have minimal alterations for the fringe toward Inverurie.
- Aberdeen control area shall be extended to encompass the Dyce and Inverurie SB areas with enough capacity to include an extension to Keith at a future date. Inverurie and Dyce signalboxes shall be closed under this arrangement.

It is envisaged that there shall be no signalling work required at Kennethmont and Huntly signalboxes.

4.2 Interlocking Technology

The interlocking technologies currently in use at Inverness and Nairn shall be retained with track circuit block being introduced to replace the key token sections between Nairn and Elgin. The TCB provision shall be achieved utilising axle counter technology with the equipment located at Forres SB.
It is anticipated that the interlocking for the proposed Dalcross loop shall be achieved by extension of the existing SSI interlocking at Inverness with associated panel alterations.

Alterations to the existing Westrace Interlocking at Nairn shall be avoided where possible.

New signalling arrangements and interlocking may be a requirement at Forres dependent on the extent of alterations required. This could be achieved by a re-control of the Forres area to Inverness although this would drive an upgrade of Waterford L.C. to control by CCTV.

Alterations to the existing Electro-mechanical signalbox arrangements shall be carried out to accommodate any stabling requirements in connection with the turnback facility at Elgin.

A new Computer Based Interlocking (CBI) and workstation shall be provided at Aberdeen SB to control Dyce to Inverurie. This provision shall incorporate the alterations envisaged to recontrol Kittybrewster ground fame and provide the passing loops between Kittybrewster and Insch (exclusive). The new interlocking arrangements would also improve the interface to the freight facility at Raithes Farm. The CBI and workstation would be required to have future capacity to control as far as Keith. The existing relay interlocking at Dyce shall be recovered as part of these works along with the mechanical frame at Inverurie SB.

4.3 Train Detection Technology

The default choice of train detection where alterations are required for this project shall be axle counters.

There are existing axle counter arrangements at Dyce and this equipment shall be modified and utilised to extend the Aberdeen control area toward Insch with enough capacity for future extension toward Keith.

New axle counter equipment shall also be provided in the Forres area to replace the key token sections to the adjacent signalboxes. Axle counters shall also be used to extend the Inverness interlocking area toward Dalcross. Derogations shall be sought on reset and restore facilities to enable co-existence with other axle counter system configurations at Inverness. If the axle counter solution causes capacity problems on the existing SSI at Inverness then a partial solution shall be the provision of DC, AC immune track circuits.

Reset and restore facilities shall be agreed for each installation.

4.4 Point Operation/Detection Technology

Hy-drive points shall be introduced for all new point arrangements. Existing point arrangements shall be retained unless a performance gain can be proved as beneficial toward achieving the project goals.

4.5 Lineside Cable Route and Housings

It is proposed to use existing cable routes as far as practicable. New cable routes shall be installed where required for the new loop arrangements. A detailed cable route survey shall be carried out to fully assess the works required for the project.

4.6 Level Crossings

The passing loop requirements selected under the final option selection process at the end of GRIP 3 shall drive the interlocking/control decision agreed for Forres SB area. This may require Waterford MCB to be upgraded to MCB-CCTV operation.

Closure of Rosarie AOCR shall be progressed in advance of this project and may remove a line speed constraint in this area.

Strike in points for various existing recently renewed level crossings can accommodate line speed increase without re-location through an agreement with the Office of Rail Regulation (ORR) obtained previously. This agreement allowed the use of a longer strike in than the current standard in anticipation of such future line speed increases in the area.

4.7 Power Supplies

Power supplies at each site shall be assessed for capacity purposes. UPS equipment will be a requirement where axle counters are being introduced.

All alterations to the signalling power supplies will be agreed with the territory E & P Engineer.

4.8 Ergonomics Integration Plan

Ergonomic workload assessments will be required at each of the sites where a signalperson's duties shall increase and where new technologies are to be introduced. These studies shall be carried out during the various option assessments in GRIP 3.

5 Construction and Staging Assumptions

The nature of this project allows the scheme to be implemented in a staged approach. Works in the different areas on the route can be prioritised and commissioned independently of each other allowing benefits to be seen earlier in the project programme.

Wherever possible the scheme shall be constructed in a manner allowing the lineside signalling equipment to be readily accessed. Co-location of FTN nodes within signalling REBs shall be considered.

Full office based principles and control table testing shall be carried out prior to the commissioning of the alterations required to the SSI at Inverness and the new CBI at Aberdeen. This will leave signalling changeover and correspondence testing on the final commissioning.

6 Development and Contractual Way Forward

GRIP stages 3 and 4 will continue the development process toward a a single option for the scheme prior to the award of contract for implementation. Staging of the work areas shall be considered during this development. This could allow several parallel contracts to be let for independent worksites and a better management of contractor resources.

GRIP stages 5 to 8 will govern the scheme through implementation to the commissioning phase cumulating in the hand back.

7 Town Planning and Other Consents / Approvals

For provision of signal structures, and equipment buildings, it is not envisaged that any planning permissions will be required as Network Rail have indefeasible rights on their property under the rules of permitted development.

There will be significant Network Change and Station Change issues for this scheme, and these shall be identified and dealt with by the enhancements sponsor.

END