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Assurance for major programmes delivering complex timetable changes: Part 2

Independent Reporter (Part C) Mandate CN/031

Office of Rail Regulation and NR

Final Report
31st July 2015

Contents

1. Introduction and background

The ORR is seeking confidence that Network Rail's major programmes are appropriately organised, governed and resourced to successfully enable the significant timetable changes planned in CP5 and beyond, principally in 2018 and 2019. There are several significant timetable changes planned for CP5, many of which involve new or cascaded train fleets, combined with route-wide infrastructure upgrades. Network Rail (NR) has a critical role to play in delivering the infrastructure and operational capability to enable the new timetables to be introduced on time and to the right punctuality.

Major cross industry rail programmes like West Coast Route Modernisation (WCRM), Thameslink and Great Western Modernisation (GWRM) have all needed mid-programme review, re-configuration and re-baselining because the complexity of these upgrades was underestimated. In the past this has sometimes led to significant cost escalation, programme delay and reputational damage to the industry. Nichols Group was appointed by the ORR and NR as an Independent Reporter (IR) to undertake a review in two parts:

1. To develop a set of generic assurance checks, through review of NR's existing processes and best practice.

2. To assess NR's approach and processes on selected CP5 programmes, using the assurance checklist and through constructive challenge of NR.

Part 1: Review of existing processes and development of assurance checklist

Subsequent to an internal review of GWRM by NR in late 2013, the ORR discussed with NR how to gain assurance for other CP5 programmes and this was the origin of this CN031 mandate. NR agreed to develop an assurance approach/proposal that would provide a starting point for the Independent Reporter CN031 review. Initial discussions between ORR and NR led to NR proposing a list of relevant existing assurance processes to include in the scope of the IR review. These were:

- Delivering work within possessions (DWWP) / engineering readiness reviews;
- Operational readiness reviews (Thameslink);
- Event Steering Groups for Timetable introduction;
- Major Project Peer reviews; and
- P3M3 capability plans.

The scope of the IR CN031 review was further discussed between the ORR, NR and the Reporter at the Review Planning Meeting on the 2nd September 2014, where it was confirmed by NR that there was no overarching assurance process and hence the above list of processes could not be confirmed as being sufficient. As a way forward, it was agreed to revise the scope of Part 1 of this mandate to review and map out NR's existing processes and any emerging practices that are relevant to the delivery of major timetable change programmes and to set out an assessment framework that would enable a rapid assessment of the status and maturity of some of these major CP5 programmes.

Part 1 of the review was undertaken from September to November 2014. Thameslink and Great Western Programmes were used as the primary sources for the review of key processes and to capture their lessons learnt. We then collated a high level summary of the processes and focused on perceived areas of weakness to create the rapid assessment framework that would be used to assess the other major programmes in Part 2. The full assessment framework is attached in Annex A.

Part 2: Programme Assessments

The rapid assessment framework was applied to a number of programmes that had planned complex timetable changes in CP5. These were:

- Midland Mainline Programme
- East Coast Programme
- Northern Programme Yorkshire
- North of England (incorporating NW Electrification and TPE)
- South West Programme
- Edinburgh Glasgow Improvement Programme (EGIP)

Using an evidence based approach, we assessed the status of each of the programmes, applying a simple assessment scoring system against the framework criteria. Our review of the documentation was limited to assessing the quality of content against industry best practice. We did not assess completeness or accuracy of the data within the information provided. We presented our assessments back to each of the programme teams in a follow-up meeting to check our understanding and we also identified common themes that were appearing across different programmes.

The report setting out our findings from Part 1 was published on 27th November 2014. This report covers Part 2 of the mandate and includes:

- A summary of the completed assessments for each of the programmes;
- Common themes observed between programmes; and
- Recommendations.

Development of a programme management process

As the IR review involved several areas of accountability within NR, including Group Strategy, Route Sponsorship and Infrastructure Projects, it was agreed to establish a CN031 Review Steering Group for Part 1 to provide clarification, on-going direction and to endorse the Rapid Assessment Framework.

As the assessment results were emerging during Part 2 of the review, the Steering Group agreed that further value would be added if Nichols (the IR) could document a proposal for a stage gate type programme process that would clarify 'programme maturity' in a similar manner to GRIP stages i.e. the steps/iterations in the process, the products/outputs required at each stage, who is accountable for decision making in the process, what trade-offs need to be managed and where do they occur etc.

Nichols undertook research into industry best practice and concepts that could be applied to an industry programme process for route upgrades; namely using HM Treasury Green Book maturity levels, the management case from the Green Book 5 case model, Major Programme Authority (MPA) gateway review points, and the tranche concept from Managing Successful Programmes (MSP) to identify the interim stages leading to timetable changes (also known as configuration states or key outputs). Drawing on this research and concepts, Nichols developed a draft programme management process for industry-wide route upgrades, embedded within an overall process for Network Strategy, and inter-locked to the development of individual projects. This process is attached in Annex B.

Reporter Team and Acknowledgements

Our Reporter team for this CN031 mandate were:

- Louise Pengelly, Review Team Leader
- Stephen Jones, Review Team Director
- Phil Clayton, Senior Reporter

We would like to thank to all the participants in this review from NR who were flexible and accommodating in meeting our requests for information, including those representatives from the Department for Transport.

2. Summary results from programme assessments

The rapid assessment framework was focused on programme governance and areas of perceived weaknesses in NR's processes, encompassing industry system integration, programme integration, and operational readiness (both at industry level and within NR). Each programme was assessed against the same generic criteria to ascertain their status and maturity.

The rapid assessment framework had five areas of focus:

1. **Programme governance structures,** particularly with regard to clarity of roles and responsibilities at strategic management level, and performance reporting to stakeholders; to give visibility as to how effectively the various programmes are organised.

2. **Industry wide programme integration** including rolling stock, franchise agreements, timetable development (and modelling) as well as the required infrastructure. This is a key process in ensuring that all elements of the programme will come together at the right time, to successfully enable complex system and timetable changes. Without this function, the route upgrade programme will have limited visibility of the status of the full programme.

3. **Industry readiness.** That is, all the operational changes that are required to operate the changed railway system, the standard operating practices and assignment of responsibilities.

4. **NR programme integration**, ensuring interfaces between infrastructure projects are known and aligned and also identifies interfaces between infrastructure projects and other functions within NR e.g. common use of access to undertake works.

5. **Bringing assets into use.** Activities would typically include implementing new maintenance regimes, understanding any requirements of new rolling stock, training people on new ways of working, for example.

A summary of the assessment results against each of the five areas for the 6 programmes are set out below. A detailed breakdown for each programme (referring to evidence received and a commentary) is available on request.

Key

Assessment Criteria:

- 🟢 Good evidence provided
- 🟡 Little evidence/insufficient quality evidence
- 🔴 Gap with a plan to address
- ⚫ Gap with no plan to address

Assessment was based on evidence of whether document(s) exist. It did not include a review of the completeness or accuracy of the documents or whether the defined processes were being followed.

Programmes:

MML – Midland Mainline
ECO – East Coast
NY – Northern Yorkshire
NOE – North of England
SW – South West
EGIP – Edinburgh Glasgow Improvement Programme

Programme governance structures

Ref	Assessment Criteria[1]	MML	ECO	NY[2]	NOE	SW	EGIP
1.1	There is a defined structure of programme and project boards with clear reporting lines and delegated authority	🟡	🟡	🟡	🟢	🟡	🟡
1.2	There is an output level statement that has been agreed by both NR and DfT/TS	🔴	⚫	🟡	🔴	🟢	🟢
1.3	There is a programme execution plan in place that sets out how the programme will be governed, monitored and controlled. Explains the scope, programme outcomes, delivery mechanisms, resourcing and organisation	⚫	🟡	-	⚫	⚫	🟢
1.4	A programme level schedule baseline has been agreed, showing the programme critical path and identifying the main interdependencies between contributions from all industry parties (e.g. infrastructure, depots, rolling stock)	🔴	🟡	-	🟡	🟡	🟢
1.5	The funding baseline has been agreed by the SRO at the DfT/TS	🟡	🔴		🔴	🔴	🟢
1.6	There is a clearly defined change control process that is being adhered to	⚫	⚫	🟡	⚫	🔴	🟡
1.7	There is a plan to implement the new DfT/TS/NR structure that has been agreed for major programmes	🟡	🟡	-	🟢	🔴	n/a
1.8	Management level information is cohesive, reported on a regular basis and provides transparency of programme status.	🟡	🔴	🟡	🟡	🟡	🟢

Industry Programme Integration

Ref	Assessment Criteria[1]	MML	ECO	NY[2]	NOE	SW	EGIP
2.1	Strong Programme Level Requirements Management and design verification showing all required remits in progress	🟢	🟡	🟢	🟢	🟢	🟢
2.2	System integration function is in place with activity and resource plans established	🔴	🟡	🟢	🔴	🔴	🟢
2.3	System Integration Management Plan (SIMP) has been defined	⚫	⚫	-	🔴	⚫	🟢
2.4	Integrated schedule established providing countdown to configuration changes and timetable steps	🔴	🟡	-	🔴	⚫	🟡
2.5	Industry level Risk, Assumptions, Issues and Dependencies (RAID) are identified and being managed	⚫	⚫	-	🟡	🟢	🟢
2.6	An effective Systems Integration Group is governing the work	⚫	⚫	-	🟡	⚫	🔴
2.7	The Capability and Capacity Assessment Framework process is being followed (or there is a plan to implement and follow in the near future) ensuring that the timetabling process is aligned to the programme.	⚫	⚫	-	🔴	n/a	🟡
2.8	Timetable assessments are undertaken for interim and final configuration states to confirm deliverability and validate that the proposed workbank, maintenance and operational methods will deliver overall train performance (ensuring modelled outputs do not give false assurance at early stages of lifecycle).	🟡	🟡	-	🔴	⚫	🟢
	An indicative train service specification is in place.	🟢	🟢	🟢	🟢	⚫	🟢
	Pedestrian modelling – whether additional constraints on pedestrian movements due to hoardings during building works, has been taken into account in timetable modelling.	⚫	⚫	-	🔴	⚫	🟢
2.9	The limitations of modelling are understood and the risk of any potential deviations from forecasts are defined, planned for mitigating actions have been put in place.	⚫	⚫	-	🔴	⚫	⚫

Industry Readiness

Ref	Assessment Criteria[1]	MML	ECO	NY[2]	NOE	SW	EGIP
3.1	Independent peer reviews are being undertaken to assess readiness for timetable changes	●	●	-	●	n/a	●
3.2	Joint communications strategy for major timetable events is in place	n/a	n/a	-	●	●	●
3.3	Non-infrastructure (TOCs/FOCs) operational capability is in place	n/a	n/a	-	●	n/a	●
3.4	Effective Operational Readiness Group is governing the work	n/a	n/a	-	●	●	●

NR Programme Integration

Ref	Assessment Criteria[1]	MML	ECO	NY[2]	NOE	SW	EGIP
4.1	Interfaces/interdependencies between projects in the programme are identified, understood and any impacts are planned for.	●	●	-	●	●	●
4.2	Interfaces/interdependencies between projects and existing assets/systems/operations are identified, understood and any impacts are planned for.	●	●	-	●	●	●
4.3	There is a plan that shows how all required critical resources for systems installation and integration activities (including specialist equipment, signal testers, linesmen etc) will be acquired, used, shared and managed.	●	●	●	●	●	●
4.4	There is a process to regularly review, identify and de-conflict resource conflicts shown in the plan	●	●	●	●	●	●
4.5	Project assumptions and key success criteria are up to date, valid and aligned to the programme	●	●	-	●	●	●
4.6	Project status, issues, changes are being reported and controlled at Programme level	●	●	-	●	●	●
4.7	Interfaces with other areas/programmes are identified	●	●	-	●	●	●

Bringing infrastructure assets into use

Ref	Assessment Criteria[1]	MML	ECO	NY[2]	NOE	SW	EGIP
5.1	Maintenance regime for new infrastructure defined, planned and implemented a) Delivery plan for asset performance / resilience works established and in place in timely manner prior to new TT operation b) New maintenance manning requirements established c) Maintenance resource training planned and delivered	🟢	●	-	🟢	●	🟡
5.2	New assets/systems are commissioned and tested prior to operational go-live, with sufficient time contingency to address any issues	n/a	n/a	-	🟢	n/a	●
5.3	NR operational capability is in place a) NR operations staffing requirements established b) New station manning requirements established c) Resources recruited and trained in timely manner	n/a	n/a	-	🟡	n/a	●

1 – Where there are a number of sub-criteria, the highest score is shown in this summary (a full breakdown of scoring is available on request)
2 – Not all elements were assessed for Northern Yorkshire Programme as the programme was on hold/under review at the time of our assessment
n/a – Not applicable due to the stage in the lifecycle of the programme (e.g. too early to have developed).

Examples of good practice from across the programmes have been identified and collated. These will be transferred to NR to be used as a basis for developing templates and improving consistency of processes and approach.

3. Common themes observed across programmes

During Part 2 assessments, we observed a number of recurring themes across the six programmes reviewed and these are summarised here.

General observations

- **The assessment framework provided helpful structure.** In the main, NR programme teams were very receptive to the review as they found the framework provided helpful guidance and structure for what they needed to do, and tools they could use to manage the programme successfully.

- **The difference between project/programme/portfolio is not understood.** The terms are used synonymously and there is a lack of appreciation of the difference, particularly between a project (that focuses on controlling time, quality and cost) and a programme (that focuses on strategy, stakeholders, governance, and benefits). This misunderstanding extends to role titles; for example a senior project manager managing a portfolio of projects in isolation of each other, is referred to as the "Programme Manager". This creates confusion and can lead to inappropriate management methods being used.

- **There is no defined programme management process for a major route upgrade.** Whilst NR has an embedded *project* management method in the form of GRIP for projects, this is not sufficient for managing Route upgrades that are comprised of multiple interconnected projects. The gap in programme management process is evidenced by:
  - Programme-level requirements are often not defined at an 'outcome' level;
  - Enhancement projects are developed 'bottom up' versus 'top down' from Programme outcomes or objectives; and
  - Weaknesses in programme controls such as a lack of baselines, integrated schedules and programme milestones.

- **Franchise changes increase the complexity of delivery** when it occurs during the lifecycle of a route upgrade programme. Train operating companies adopt increased levels of commercial confidentially in the period leading up to a franchise award (up to 18months before) and are less likely to be able to

share information and integrate with the programme as effectively. The nature of the impact on the programme will depend on exactly when the award occurs. For example, a new franchise award during the development period of a programme may result in some reworking of capacity requirements (if the franchise award is different from assumptions used for planning); whilst a new franchise taking over operations during the delivery stages of a programme, could result in the disruption of operational readiness plans.

Programme governance

- **DfT/TS involvement is crucial to the success of Route Upgrades.** The involvement of DfT/TS in the revised structure of industry programme boards is welcomed by NR; the previous stakeholder boards were useful for consultation but lacked decision making. In the new structure, DfT/TS undertake the role of chair and provide a link to their work on franchises. Further clarity is still required in some areas, particularly with regard to the role of industry system integration. Making informed decisions on system integration at an industry level (such as deciding on trade-offs between rolling stock and infrastructure), requires integration capability and support to analyse the options and assess the impact of any changes, for example. The expectations of the DfT/TS as client for the integration capability and NR's role as potential provider of this capability were not clear at the time of this review.

- **Output requirements are not defined.** In all programmes except the South West and Edinburgh to Glasgow Improvement Programme, the output requirements have changed during the programme, some by a significant amount (such as Midland Mainline). We did not find evidence of formal change processes that assessed affordability or feasibility implications at Programme level.

Industry Level Programme Integration

- **System integration is weak across all programmes**, at both Industry level and within NR when assessed against the framework. System integration refers to the management of all components of a programme to ensure the right thing is going to be delivered at the right time to the right specification to enable the timetable change. It is the difference between managing independent projects (or a portfolio of projects) and managing different components simultaneously to ensure that when brought together they function as one system. At Industry level the System Integrator would act as an Intelligent Secretariat, raising issues and highlighting decisions that needed to be made by the System Authority (or Programme Board). The System Integrator would ensure the integration of timetable development with infrastructure, rolling stock and franchise awards among other things. At NR level this involves

integrating multiple infrastructure projects. Effective system integration is a critical component to delivering the outcomes or objectives of a programme. When done well, it is clear what has to be done and by when, progress is monitored and visible to stakeholders and change is controlled. This minimises the risk that components will be delivered late or do not meet the requirements.

- **Timetable modelling and simulation is not an intrinsic part of the process** for validating interim and final configuration states. Investigating the impact and root cause of this issue was beyond the scope of this review but it is worth highlighting that timetable modelling and simulation is NR's assurance against performance risk; i.e. NR is obliged to ensure infrastructure enhancements do not adversely impact on their regulated PPM targets. If timetabling modelling and simulation is not carried out, then it may only come to light that PPM targets cannot be met *after* the infrastructure enhancements have been delivered.

- **Creation of the Indicative Train Service Specification (ITSS) can set misleading expectations.** The ITSS is developed by Industry Planning Groups through an open industry process. On some programmes this activity is carried out in isolation of programme governance at the risk of deliverables being "agreed" prior to any assessment of affordability or feasibility. On the North of England programme, this has led to a mismatch between the infrastructure being delivered, and the ITSS that has already been confirmed with stakeholders.

NR Infrastructure Programme Integration

- **A portfolio approach is being used successfully to co-ordinate access plans,** particularly on the London North East Route where resources and access is organised and managed by five geographic areas that span across the major programme boundaries. The objective is to improve efficiency in resource utilisation and minimise disruption to operations. A similar approach is being used in Scotland where resources are organised by discipline across the route.

4. Recommendations

Our recommendations flow from the common themes reported in the previous section. Our proposed recommendations are listed below with suggested criteria by which completion will be assessed. The target dates will be set through the recommendation tracking process.

Reference	Recommendation	Suggested evidence to close
CN031-1	A programme process suitable for managing Route upgrades (comprised of multiple industry wide projects) should be defined and implemented across Network Rail, building on the 'GRIP for Programmes' recently published. This should include clarifying the roles and responsibilities of industry partners in the governance of a programme, and the input required from partners at each stage (including inputs from any franchise awards). The Programme process should identify competencies required from other industry parties to participate in the process, as a way of highlighting the need for Capability Development. It should also incorporate the timetable development process and continual modelling of outputs throughout the lifecycle of a programme to provide assurance that the programme will deliver the performance targets. NR should be the champion of the programme process within industry, making changes to those elements that are within NR control. Implementation should include educating the industry on the difference between a project, an infrastructure programme or portfolio, and an industry wide programme approach.	Guidance document for a Network Rail industry programme process. Implementation plan incorporating training and development of NR programme teams. Awareness and education plan reaching wider NR organisation, stakeholders and partners involved in delivering major industry programmes. . Clarification of roles and responsibilities of industry partners.

Reference	Recommendation	Suggested evidence to close
CN031-2	Examples of good practice from across the programmes should be used to develop guidance notes on programme controls for the industry wide programme process and templates to improve consistency between programmes.	Guidance notes articulating programme controls and templates for deliverables. Library of programme resources accessible across Network Rail
CN031-3	Output requirements (i.e. changes in the attributes of the rail system that are measurable and experienced by the rail user. Examples include train service reliability, carrying capacity (seats and standing space), journey time, the timetable, CO2 emissions), should be re-confirmed with the DfT/TS. Further work should be undertaken to improve the effectiveness of the change control process at the Industry Programme Level.	Output requirements for each of the programmes reviewed with evidence of sign-off/confirmation from DfT/TS. Report identifying improvements to the change control process at an Industry Programme Level.
CN031-4	Guidance should be developed for System Integration (SI) at both industry and Network Rail level, drawing on examples of best practice identified through this review and which fully defines the SI activities, accountabilities and funding arrangements. This guidance should then be implemented across all major programmes to increase the system integration capability and ensure consistency of approach.	Guidance document for System Integration responsibilities and processes agreed between DfT/NR/ORR. Implementation plan incorporating training and development of system integration teams.
CN031-5	The process of developing the ITSS through Industry Planning Groups should be reviewed and controls strengthened to ensure that decisions are not made without first assessing the affordability, feasibility and impact on infrastructure.	Process review documentation identifying gaps in decision making/approval process, the role of the System Integrator and implementation plan to address.

Annex A – Assessment Framework with examples

CN/031- Part 2A: Assessment framework

Ref	Assessment Criteria	Suggested evidence	Examples to draw from
1. Programme structure			
1.1	There is a defined structure of programme and project boards with clear reporting lines and delegated authority	a) Programme organisation chart showing boards, steering groups etc. b) TOR for governance groups	CN31-NR013 Visio-Updated GWRM Governance arrangements proposal v3.6 CN031-2 NOE002 NoEP Governance Structure and Terms of Reference v0.7 CN031-2 NOE040 DPB010 Governance Update
1.2	There is an output level statement that has been agreed by both NR and DfT	Output level statement eg DfT Infrastructure Output specification;	MML005 - Output statement
1.3	There is a programme execution plan in place that sets out how the programme will be governed, monitored and controlled. Explains the scope, programme outcomes, delivery mechanisms, resourcing and organisation	Programme Execution Plan	CN031-2 EGP010 EGIP Programme Management Plan v6 0
1.4	A programme level schedule baseline which has been agreed, showing the programme critical path and identifying the main interdependencies between contributions from all industry parties (e.g. infrastructure, depots, rolling stock)	a) Level 0 milestones agreed with industry, underpinned by an integrated schedule	Request updated version from GWRM?
		b) Minutes of appropriate forum recording agreement	
1.5	The funding baseline has been agreed by the SRO at the DfT	a) Funding Baseline with detail of where funding has come from	Not observed
		b) Minutes of appropriate forum recording agreement	
1.6	There is a clearly defined change control process that is being adhered to	a) Change control work instruction	Not observed (for industry level changes)
		b) Change control logs	
		c) Example of minutes from change control panel	
1.7	There is a plan to implement the new DfT/NR structure that has been agreed for major programmes	Action plan setting out changes to be made, who is actioning, timescales.	CN031-2 NOE002 NoEP Governance Structure and Terms of Reference v0.7
1.8	Management level information is cohesive, reported on a regular basis and provides transparency of the status of the programme.	Monthly reporting packs to Programme Board and other appropriate fora with agreed KPIs on progress (e.g. cost, schedule, quality, scope delivered)	Crossrail Programme Report CN031-2 EGP003 PRG Progress Report P10 2014-15 (Although limited to infrastructure only)
2. Industry Programme Integration			
2.1	Strong Programme Level Requirements Management and design verification showing all required remits in progress: a) Route Programme Requirements Document completed	a) Route Programme Requirements Document completed	MML046 MMLE DRRD ISSUE V1
	b) Configuration States Matrix defined	b) Configuration States Matrix defined	MML003 - Config State Matrix
	c) Configuration States Migration plan defined showing key deliverables leading up to each configuration state	c) Configuration States Migration plan	CN031-2 NOE006 109172-0-ESE-PLN-NWR-000004 (Version H) - Signed
2.2	System Integration function in place with activity and resource plans established	a) Activity and resource plan for the team	CN031-2 EGP026 1503 EGIP SIMP Rev A03
2.3	System Integration Management Plan (SIMP) has been defined a) SIMP has been verified by all appropriate stakeholders	a) SIMP	CN31-NR022 - GWISI-PBR-PLN-ESE-000017 GW ISI System Integration Management Plan
	b) SIMP has been approved and signed off via Governance c) Roles and responsibilities are defined d) SIMP includes details on Operational Integration (timetable development, rolling stock, depots, stabling, performance strategy) e) Defines progressive assurance process f) Defines System Engineering Strategies	b) Minutes from governance body recording agreement	

Ref	Assessment Criteria	Suggested evidence	Examples to draw from
2.4	Integrated schedule established providing countdown to configuration changes and timetable steps	a) Level 1 Industry wide integrated schedule showing interdependencies	Not observed
	a) Schedule shows all the components, is complete	b) Route level integrated schedule covering all key timetable changes, supporting commentary, and key milestones between projects	Not observed
	b) Schedule shows key deliverables from external organisations c) Dependencies are shown d) Stakeholders have been engaged e) Accuracy and completeness has been verified/approval/sign off obtained via Governance groups f) Baseline is maintained and risk assessed g) Reporting and change control process in place h) Live schedule, variations are recorded and tracked i) Flexibility (or float) allowed for in schedule	c) Programme to project scope mapping, including modelling assumptions, or mapping that shows how route requirements have been translated to project level requirements (and how those are approved)	Procedure: CN031-2 EGP025 1503 EGIP V&V Strategy Rev A01 Worked example not observed
2.5	Industry level Risk, Assumptions, Issues and Dependencies (RAID) are identified and being managed	a) Risk, Issues Register & Action log	CN031-2 WES027 - 150429-risk-register- SWRC Programme risks_FINAL APRIL
	a) Appropriate content of RAID log b) Assigned owners to any actions required c) Regular review, challenge, feedback	b) Assumptions and Dependencies log (or maybe captured in scope statements)	Included in Route Req Doc: CN031-2 EGP007 EGIP RRD A03 171214 BE comments
2.6	a) Stakeholders all engaged and inputting to process b) Clear purpose and terms of reference c) Active and well supported d) Minutes taken, actions followed up	b) 3 months of minutes	
2.7 (previously 4.1)	The Capability and Capacity Assessment Framework process (see evidence reference CN31-NR041) is being followed (or there is a plan to implement and follow in the near future) ensuring that the timetabling process is aligned to the programme.	a) Meeting schedule showing ESG, IPG, and Steering Groups	
		b) TOR for the above groups	EC019 IPG ToR 0 1
		c) If not yet in place, an Implementation plan, actions identified and owned	
2.8 (previously 4.2)	The train service specification for each timetable change or key output has been translated into a timetable design that has then been modelled for robustness. A) There is an ITSS in place	Modelling outputs for key timetable changes	Not observed - Thameslink have example?
		a) Indicative train service specification	MML015 - Appendix C ITSS
	b) Modelling or timetable assessments are being used in accordance with recognised standards and good practice to provide timely assurance that the timetable is robust and planned infrastructure fit for purpose	b) A modelling plan showing realistic modelling cycle times, run cases and stakeholder review points	Not observed - Thameslink have example? (or example from recommendations to CN021?)
	c) Effective governance and control of the modelling process	c) Modelling plan includes Interim State timetables as well as the end state timetable	Not observed - Thameslink have example?
	d) Effective use of modelling outputs to drive confidence in infrastructure and timetable design and stakeholder confidence	d) Modelling includes Railsys to check 'normal day' timetables and Trail to forecast PPM	CN031-2 EGP004 NR_NO_SA_REP_00209 A01 EGIP TRAIL Report
	e) An assessment of the impact on outputs (either via modelling or other means) of the interim configuration states demonstrates the viability of interim timetables	e) Functional Configuration Audit (FCA) tables that document scope modelling iterations, owners for each input identified and evidence of sign off	CN021 - Modelling Operational Performance for the Thameslink Programme
	f) Interim timetables will maintain (or recover) PPM targets	f) Signed off reports at each logical stage; Evidence of stakeholder buy-in e.g. minutes of meetings, clear governance around them, owners identified and inputs signed off	Not observed
		g) Evidence of presentations to range of relevant audiences to drive confidence	Not observed
		h) Evidence of where decisions have been taken or changes made in the light of modelling work.	Not observed
		i) Evidence of Route Asset Managers engagement as stakeholders with agreed reliability inputs, response and repair times	Not observed
		j) Evidence of formal handshake process between timetable development and modelling function	Not observed
		k) Control documents that show modelling resource is being controlled through a transparent request/priority system e.g. Thameslink SMRF process	Not observed
	g) pedestrian modelling – whether additional constraints on pedestrian movements due to hoardings during building works, has been taken into account in timetable modelling.	l) Evidence of pedestrian modelling	See EGIP

Ref	Assessment Criteria	Suggested evidence	Examples to draw from
2.9 (previously 4.3)	The limitations of modelling are understood and the risk of any potential deviations from forecasts are defined, planned for mitigating actions have been put in place.	Modelling reports / executive presentations clearly identifying assumptions made and showing an annual range of performance forecasts i.e. Summer to Winter	Not observed
3. Industry Readiness			
3.1	Independent peer reviews are being undertaken to assess readiness for timetable changes	Records of any readiness reviews, showing actions required and outcomes	CN031-2 MML028 EC Programme Board Aug 2014 v4 RS (slides 1-13)
	a) Readiness reviews of blockades causing weekday timetable changes		
	b) Readiness reviews for non-blockade changes		
3.2	Joint communications strategy for major timetable events is in place	Communication strategy	CN031-2 EGP013 EGIP Comms Strategy 2014 FSR comments V3_2
3.3	Non-infrastructure (TOCs/FOCs) operational capability is in place	a) Assurance received from TOCs on new operational capability (maybe in form of minutes from working groups)	Not observed
	a) New train crew and depot manning requirements established	b) Handover documentation for depots C	Not observed
	b) Vehicle acceptance testing c) Crew and traction training has been established, planned and delivered d) Depots are fitted out/commissioned	c) Commissioning plans	Not observed
3.4	Effective Operational Readiness Group is governing the work	a) Operational Readiness Group TOR	Not observed
	a) Stakeholders all engaged and inputting to process b) Clear purpose and terms of reference c) Active and well supported d) Minutes taken, actions followed up	b) 3 months of minutes	
4. Network Rail programme integration			
4.1	Interfaces/interdependencies between projects in the programme are identified, understood and any impacts are planned for.	a) Integrated schedule showing give/gets between NR projects. Alternatively, a list of dependencies shown in individual project plans	EC025 ECML 2020 Integration Programme 6-3-15
		b) Infrastructure configuration plan showing interim infrastructure states through the commissioning process	
4.2	Interfaces/interdependencies between projects and existing assets/systems/operations are identified, understood and any impacts are planned for.	a) Integrated schedule showing dependencies between the programme and the operation	EC025 ECML 2020 Integration Programme 6-3-15
4.3	There is a plan that shows how all required critical resources for systems installation and integration activities (including specialist equipment, signal testers, linesmen etc) will be acquired, used, shared and managed.	a) Scarce resources plan showing compliance with the national critical resource procedure	CN031-2 NOE043 Northern Hub Electrification Critical Resource Report Period 02 V04 151 (extract from P6)
		b) ENROL resource schedule	Not observed
		c) Access requirements plan	MML008 - TC Disruptive Possessions SoB 150302
4.4	There is a process to regularly review, identify and de-conflict resource conflicts shown in the plan	a) Copy of reports to resource conflicts meetings	CN031-2 NOE023 Signal Tester Demand Forecast Late May 2015 V4
		b) Minutes or action lists showing status and ownership of actions	
4.5	Project assumptions and key success criteria are up to date, valid and aligned to the programme	a) Assumptions register	Included in RRD: CN031-2 EGP007 EGIP RRD A03 171214 BE comments
		b) Signed Project Requirements Statements	CN031-2 EGP002 RRD Anniesland
4.6	Project status, issues, changes are being reported and controlled at Programme level	a) Periodic Programme Reports	CN031-2 EGP003 PRG Progress Report P10 2014-15 (Final)
4.7	Interfaces with other areas/programmes are identified	Evidence of review meetings, box plans showing dependencies	MML034 - 2016-17 (2016TT) Scot-LNE-LNW Strategic Plan Ver 16 0 3 (26-05-14) (3)
5. Bringing infrastructure assets into use			

Ref	Assessment Criteria	Suggested evidence	Examples to draw from
5.1	Maintenance regime for new infrastructure defined, planned and implemented a) Delivery plan for asset performance / resilience works established and in place in timely manner prior to new TT operation b) New maintenance manning requirements established c) Maintenance resource training planned and delivered	a) Maintenance strategy for newly introduced assets / systems	MML049 3 12 31 Maintenance Strategy
		b) Delivery plan showing the transition from IP to Operations, with clear interim maintenance arrangements prior to full operation / hand-over	MML048 3.12.30 Operations Strategy
		c) Maintenance manning plans or forward looking rosters	MML045 Maintenance Costs Electrification impacts (MMLE)
		d) Maintenance training and development plans	MML050 EP Courses Mapped to Roles - WW-v4C
5.2	New assets/systems are commissioned and tested prior to operational go-live, with sufficient time contingency to address any issues	Testing and commissioning schedules as part of the integrated plans (supporting the overall programme schedule)	CN031-2 NOE045 Appendix I Testing Programme v1.0
5.3	NR operational capability is in place a) NR operations staffing requirements established b) New station manning requirements established c) Resources recruited and trained in timely manner	a) NR operations staff recruitment and training plan, especially where new systems are being brought into use, eg newly electrified railway, ETCS signalling, alternative control arrangements etc.	Not relevant for majority of programmes
		b) Station manning plans or forward looking rosters	Not relevant for majority of programmes
		c) Station training and development plans	

Annex B – Programme Process

Proposed Programme Process – DRAFT v1.0

Network Strategy

Set the long term rail industry strategy

- Long term national strategy
- Rail masterplan
- Affordability considerations
- Long term planning process

Agree outcomes and measures

- Agree high level national outcomes
- Confirm priorities/ hierarchy of routes
- Set Measures & Targets (not just PPM?)

Identify strategic outline programmes

- Identify proposals to meet outcomes, and group according to synergy and holistic fit
- Issue programme output level statement

Gate 0: Strategic fit

Route Upgrades

1. Programme Definition

- Identify solutions to meet outcomes for both rolling stock and infrastructure
- Integrate renewals and enhancements
- Capacity analysis modelling (i.e. high level feasibility)
- Establish Programme Governance
- Establish cost & benefit range

Gate 1: Business Justification

2. Programme Established

- Formal stakeholder input via IPG (consult on ITSS)
- Define major operational configurations and tranches
- Timetable modelling (decide on variables, assess options)
- Establish System Integration team
- Establish programme controls
- Set asset management strategies

Gate 2: Delivery Strategy

Manage the delivery of configuration states (tranches)

4. Deliver Solutions

- Resolve programme level issues
- De-conflict resources, co-ordinate access
- Establish ESG process
- Monitor, co-ordinate and commission projects

Gate 3: Investment Decision

Gate 4: Go live

3. Develop Solutions

- Final business case by project
- Option assessment and selection
- Finalise Timetable modelling
- Manage strategic level risks
- ECAM (formal funding approval)

5. Transition into use

- Readiness reviews
- Manage stakeholder comms
- Monitor and co-ordinate training and commissioning
- Utilisation of enhanced capability
- Introduction of new timetable

Gate 5: Benefits Realisation

6. Evaluate and adjust

- Assess whether outcomes are achieved (or on target to be achieved)
- Identify whether any further work required to future configuration states (to meet outcomes)
- Identify lessons learned to apply to future configuration phases

Gate 6: Close tranche/ programme

7. Close the programme

- Assess completeness of delivery of the output requirements
- Assess realisation of benefits, confirm the Business Case has been satisfied
- Undertake post-programme reviews
- Ensure ongoing ownership of any outstanding risks, issues, operational support
- Disband the programme organisation