6.10 Assurance Process

6.10.1 Quality and Assurance

6.10.1.1 Objectives

The aim of CRL's assurance process is to help provide an appropriate organisation with high-quality plans and processes for CRL to confidently deliver a world-class railway, and, against these plans, assure that all requirements in the agreements with the Sponsors and other stakeholders are being met.

The objectives set out in CRL's Quality Policy are to:

- Achieve CRL's vision and values, including the delivery of a world class affordable railway;

- Manage all functions in an effective and efficient manner;

- Set realistic, measurable objectives and targets for all activities, to assist delivery of performance and progress;

- Apply the principles of 'right first time' and continual improvement to our performance;

- Ensure compliance with legislation, regulatory requirements, and relevant codes of practice and standards;

- Place accountability for quality with those best placed to act; and

- Implement audit, surveillance and review programmes to monitor compliance with requirements and assess the effectiveness of the system.

Assurance is the provision of confidence to those who need to receive it that the Crossrail Project will be delivered:

- In compliance with the Crossrail Act 2008 and all Sponsors Requirements;

- Using controlled processes; and

- By competent persons.

Our objective on assurance is to establish and maintain an Assurance Process that provides the CRL Executive, CRL Board and the Sponsors with evidence that delivery of the programme is progressing in compliance with all requirements.

One of those requirements is to provide progressive assurance. The PDA (Clause 15.2) states that *'CRL shall develop an assurance process that will enable it to demonstrate compliance with Clause 3.2 to the Sponsors and other interested parties as necessary, including the Operators and any independent review bodies appointed by CRL (the 'Assurance Process'. The Assurance Process …… shall form part of the Delivery Strategy.'*

6.10.1.2 Challenges

The principal challenges for quality and assurance are:

1. Achieving strong alignment between all Crossrail functions and between Crossrail Delivery Teams and the Industry Partners;

2. The number of parties involved in Crossrail, and their differing assurance requirements, which pose a significant risk to the timely delivery of Crossrail. There is a potential overload and suffocation of the programme if assurance is unconstrained, uncoordinated and inefficient; and

3. The extent to which the Integrated Crossrail Team has management control or influence over the Industry Partners' assurance processes.

6.10.1.3 Approach

The Assurance Process (see figure 6.11 below) has been established in order to meet the requirements of the PDA and includes:

1. An assurance process for Sponsors to meet the requirements of Clause 3.2;

2. Assurance for various Government bodies and other 3rd parties; and

3. A technical assurance process for future Infrastructure Managers and Operators of Crossrail.

Within CRL, the responsibility for assurance is as follows:

- The CRL Board is accountable for providing assurance to the Sponsors;

- The Executive Committee (ExCom) is responsible for providing assurance to the CRL Board; and

- The Programme Director is responsible for providing assurance to the Executive Committee with regard to the delivery of the Crossrail Project, in terms of cost, schedule and meeting the performance levels specified in the Sponsors Requirements.

The Programme Director is also responsible for:

- Monitoring performance and alignment of the organisation in the effective and efficient delivery of Crossrail; and

- Setting out the way that the organisation works and how its activities are carried out in a manner consistent with the Delivery Strategy.

6.10.2 Crossrail's Programme Assurance Strategy

CRL's approach to assurance is described in Crossrail's Programme Assurance Strategy. It is based on the assurance chain as shown in figure 6.11.

1. The CRL client, acting through the functional departments, sets the project requirements in compliance with the Sponsors Requirements. This is shown as '**Assured Delivery'**.

2. The delivery of these requirements is shown as '**Delivery**' which is the process by which the requirements are provided by the Tier 1 Contractors and their supply chains and managed by the Crossrail Central Section Delivery team.

3. Establishing the quality requirements in the contracts awarded by CRL, monitoring the quality performance of Contractors, and maintaining the Crossrail Management System (CMS) to ensure Crossrail's BS EN ISO 9001 certification is maintained is also the responsibility of the CRL client. This is shown as **'Assured Quality'**;

4. Assuring that Crossrail will meet its Project Milestones, Staged Opening Dates, and that its forecast remains within the limits of available funding and the funding profile is the responsibility of the CRL Client within the Programme Controls department. This is shown as **'Assured Controls'**.

5. Auditing that CRL is complying with its documented CMS, that Principal Contractors are complying with the Works Information and that the governance structure and financial controls developed to mitigate risk to the Project are effective is the responsibility of the Crossrail Internal Audit team. This is shown as **'Internal Audit'.**

6. Independent Assurance is provided by audits carried out by TfL and by third parties as well as surveillance activities conducted by the Project Representative for the Sponsor, KPMG (financial audits), LRQA (management system certification audits) and the National Audit Office. This is shown as **'Independent Audit'**.

This model will be applied to all assurance requirements wherever they arise within the Crossrail Project:
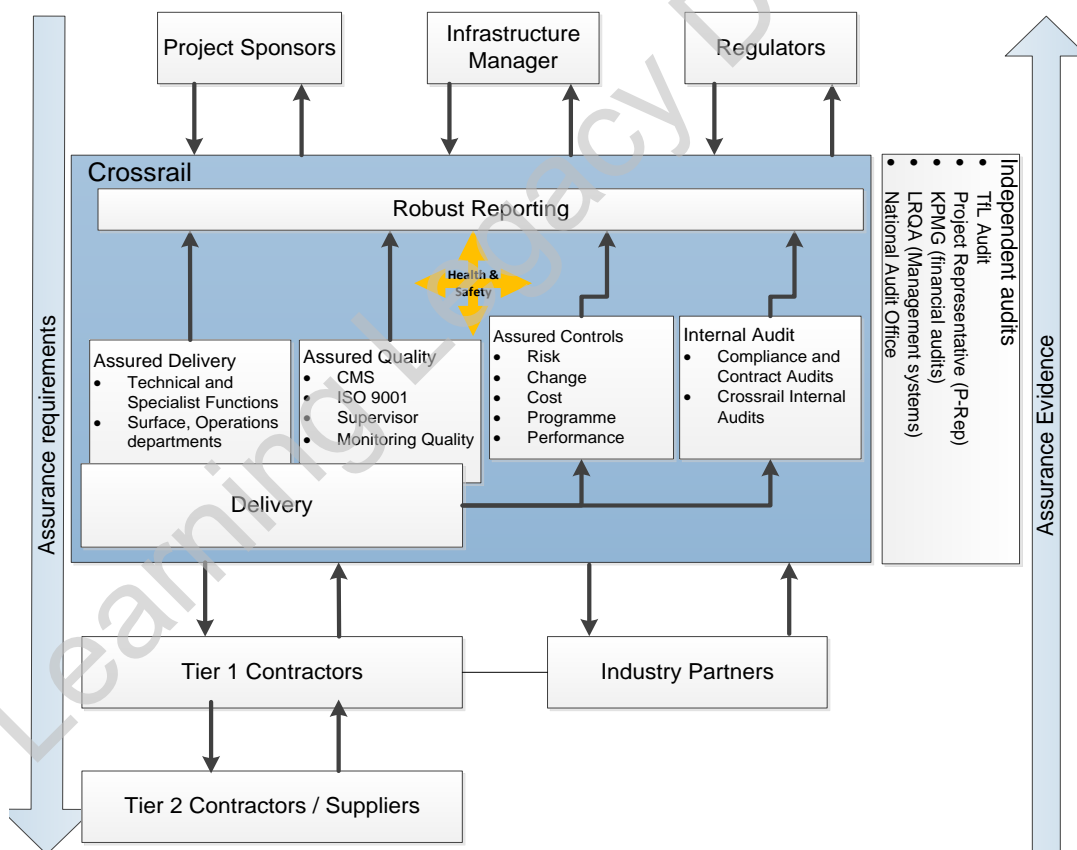

Figure 6.11 – Crossrail Assurance Chain

The CMS demonstrates and communicates to the programme and project teams through the Management Plans, processes and procedures, how the strategy for delivery of the programme described in this Delivery Strategy is to be implemented. This includes the assurance processes identified in CRL's Programme Assurance Strategy.

6.10.2.1 Meeting the PDA Requirements for Assurance

The following table sets out the requirements of Clause 3.2 in the PDA and the relevant assurance process that will be used to demonstrate that each requirement is met.

Source	Requirement	Relevant Assurance Process
PDA 3.2 (a)	To satisfy the Sponsors Requirements.	Affirmation (that the CPFR satisfy the Sponsors Requirements) as agreed in the Sponsors Requirements Validation Procedure.
PDA 3.2 (b)	In accordance with the CPFR.	Certification of designs as compliant with CPFR (and of construction as compliant with designs).
PDA 3.2 (c)	In accordance with the terms of this Agreement and the other Principal Project Documents.	The Agreements Compliance Procedure.
	In accordance with the necessary consents.	Consent tracker and contract requirements.
	In accordance with the Environmental Minimum Requirements.	The Environmental Management System.
	In accordance with the Undertakings and Assurances.	The Compliance with Commitments procedure.
PDA 3.2 (d)	In a manner consistent with the Delivery Strategy.	The CRL Management Plan and the supporting management system (CMS).
PDA 3.2 (e)	In a manner that will oblige the Operators to accept the Handover of assets and systems.	Technical assurance, at present through the CRL technical assurance processes ,the Infrastructure Managers' own assurance processes, and the Handover Strategy and Plan.
PDA 3.2 (f)	To meet the Project Milestones and so that the Final Delivery Date occurs on or before the Target Final Delivery Date and, in any event, on or before the Longstop Date.	CRL Programme Controls processes. See section 5.11 for more details.
PDA 3.2 (g)	In accordance with any additional conditions that are imposed as a result of the Project Review.	CRL Change Control process. See section 5.11.6 for more details.
PDA 12 & 3.8	Health and Safety.	The Health & Safety Management System.
PDA 17.1	Assurance that Crossrail is forecast to be completed within the limits of available funding and the funding profile.	Programme Controls and financial audit procedures.

Table 6.2 – PDA Requirements and relevant assurance process

These relevant assurance processes are developed and implemented and disseminated as part of the Crossrail Management System. They are also supported within Crossrail by:

Integration Assurance

The Crossrail Integration and Assurance team monitors the completeness of the assurance framework, and the effectiveness of the individual assurance processes, in the following areas so as to avoid unnecessary duplication, omission, incompatibility or confusion:

- Requirements Assurance: owning the CPFR and ONFR, including compliance, and the overall strategy for validation and verification (V&V);

- Railway Integration Assurance: managing the railway integration process; integration co-ordination, strategy and reporting; and leading integration issues resolution, as required

- Technical Assurance: owning the Technical Assurance Plan and gate review process, ensuring it is adhered to, and assembling the assurance evidence for submission to the IM's; and

- Engineering Safety Management: Managing the overall process and Crossrail's independent safety and interoperability assurance through the NoBo, DeBo and AsBo teams.

Internal Audit

Internal audit is the assurance provided by activities that both verify compliance with the documented management system and assess the suitability and effectiveness of the documented management system to deliver the works in compliance with the specified requirements.

6.10.2.2   Assurance for Government bodies and other 3rd parties

Independent Assurance is provided through audits carried out by TfL and by third parties as well as surveillance activities conducted by the Project Representative for the Sponsor.

Independent Audit

The CRL Board has an Audit Committee, which provides assurance on systems of internal control, control and management of corporate risk, and oversight of corporate governance and the audit process.

CRL will cooperate with third parties that have various rights and obligations to carry out audit/assurance activities on Crossrail. TfL has established the Crossrail Integrated Assurance Group (CIAG) to coordinate such activities and thus minimise their impact on the programme.

Whilst assurance will be provided through implementation of the processes identified in the Assurance Plan described above, a second line of assurance will be provided through a programme of audits to confirm that processes are fit-for-purpose, efficient and implemented effectively. An annual integrated audit programme will be established which focuses on those areas that present the highest risk to delivery of the Crossrail programme. Findings are reported to the CRL Audit Committee.

A key risk is the suffocation of the programme through the number of assurance entities, interfaces and interventions. In order to mitigate this risk CRL management will work with the assurance stakeholders to minimise the volume of active, direct assurance, within the constraint of the project agreements, and maximise the extent to which passive, indirect assurance can meet requirements such as stakeholders' reports to CIAG

Expert Panels

To ensure that best practice is available to Crossrail, CRL will continue to subject certain engineering and architectural matters to peer review from expert panels. As the project focus shifts from civils to systems and operations the continuation or formation of panels will be reviewed. The expert panels report to CRL in an advisory capacity. Reviews cover infrastructure for Crossrail and the effect on third party infrastructure and systems. The technical panels are as follows:

- The Operations and Systems Expert Panel has a remit to carry out high level peer reviews of systems and reports independently to the Crossrail Executive Committee;

- The Engineering Expert Panel had a remit to carry out high level peer reviews of the civil engineering tunnelling and subsurface works, and is no longer active;

- A Procurement Expert Panel had a remit to encourage best value for money procurement within the requirements of public procurement legislation, but is no longer active.

6.10.2.3   Technical Assurance for future Infrastructure Managers and Operators of Crossrail

CRL management will provide leadership in the form of progressive technical assurance to ensure that the Sponsors Requirements are met by the Industry Partners and Crossrail Delivery teams throughout the programme. The scale of Crossrail and the number of delivery partners and future Infrastructure Managers makes this a substantial task.

Evidence for technical assurance will be prepared by the supply chain, checked and collated by Crossrail Delivery teams, assured by the CRL Client and the Industry Partners and submitted to RfL and LU. For the Central Section works the Infrastructure Managers' Progress Review Group (IMPRG) supports and co-ordinates the submission and approval process. Where an assurance submission affects more than one IM, CRL will identify and agree with the IMs the route for acceptance.

For the Central Section works CRL has established IMPRG to support the approval process and to facilitate progress to acceptance on issues affecting more than one Infrastructure Manager or the interfaces between them. The remit of IMPRG is therefore to support the designated Infrastructure Managers to discharge their responsibilities. This approach to progressive technical assurance is summarised in figures 6.12 and 6.13.

CRL has defined, agreed and documented clear boundaries and interfaces with the Infrastructure Managers for maintenance and operational responsibilities. This simplifies the design and assurance processes for the Central Section Works, because the future IM will be consulted on maintenance and operational aspects by the delivery teams during the design process. It will also demonstrate how progressive assurance will be presented to the Infrastructure Manager for acceptance. Assurance evidence for interfaces (boundaries) will be presented to the future IM for acceptance.

The Railway Assurance Board [Crossrail] (RAB[C]) will assure that the Crossrail end-to-end railway is safe. It will act as:

1. CRL's Safety Review Panel (SRP) – for all Central Operating Section assets;
2. RfL's Infrastructure Manager Safety Review Panel (SRP) – independently assuring that RfL can accept assets "into use"; and
3. Co-ordinator of Duty Holders – acting as Lead Duty Holder with accountability for satisfying itself that RfL's operational and maintenance activities are integrated between all other Duty Holders (e.g. CRL/NR/LU) and MTR[C] (the CTOC) across the end-to-end railway.

The purposes are complementary with much of the safety assurance reviewed both through (1) as CRL's SRP and (2) to allow acceptance of the assets by RfL from SRP. Where the roles differ is in authorising the railway infrastructure to be brought into use. In this case, RAB [C] is additionally required to review and approve RfL's demonstration/evidence of Operational Readiness and Maintenance Readiness (3).
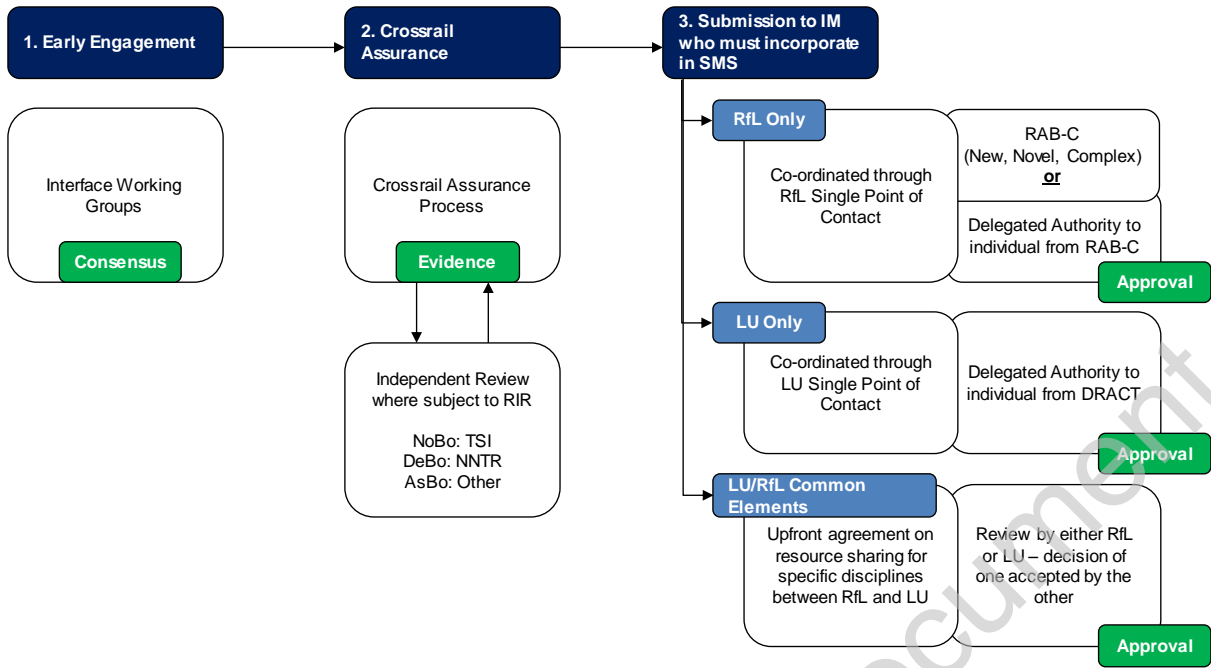
1. Early Engagement → **2. Crossrail Assurance** → **3. Submission to IM who must incorporate in SMS**

Interface Working Groups

Consensus

Crossrail Assurance Process

Evidence

Independent Review where subject to RIR

NoBo: TSI
DeBo: NNTR
AsBo: Other

RfL Only
Co-ordinated through RfL Single Point of Contact

RAB-C (New, Novel, Complex) **or**

Delegated Authority to individual from RAB-C

Approval

LU Only
Co-ordinated through LU Single Point of Contact

Delegated Authority to individual from DRACT

Approval

LU/RfL Common Elements
Upfront agreement on resource sharing for specific disciplines between RfL and LU

Review by either RfL or LU – decision of one accepted by the other

Approval

Figure 6.12 – Working Principles for progressive technical assurance - Management of LU/RfL Interfaces

1. Early Engagement → **2. Crossrail Assurance** → **3. Submission to IM who must incorporate in SMS** → **4. Permission to place assets on NR infrastructure (if req)**

Interface Working Groups

Consensus

Crossrail Assurance Process

Evidence

Independent Review where subject to RIR

NoBo: TSI
DeBo: NNTR
AsBo: Other

Review and decision by Competent Person to discharge duty under ROGS

Approval

Evidence required to implement changes to SMS agreed in advance between Crossrail & IM

(A sub-set of evidence created by Crossrail Assurance Process)

Specific request re placement of infrastructure on or near operational assets
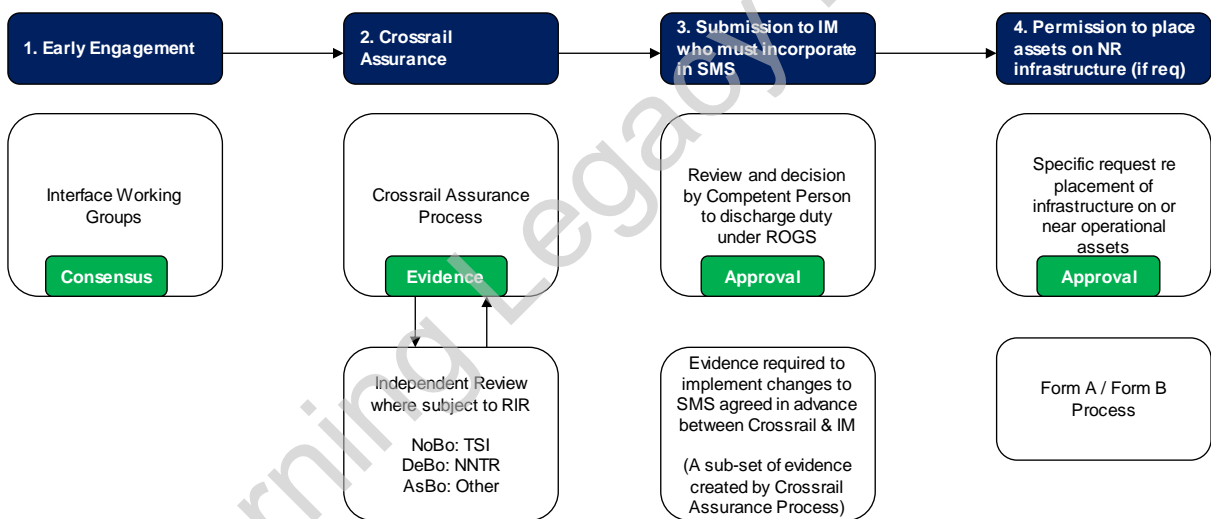
Approval

Form A / Form B Process

Figure 6.13 – Working Principles for progressive technical assurance - NR/RfL Interfaces

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