Sponsors' Handbook

A better railway for a better Britain

14 January 2014

12.4 Structure

The accountability for long term planning of the network lies with Group Strategy. The network strategies are defined for 10 to 30 year horizons hence Group Strategy holds the responsibility to identify and define the high level requirements. To allow for those strategies to be delivered by the Routes and the Deliverers, requirements must be captured in a structured and unambiguous manner to enable the achievement of the objective which is delivering a better railway for a better Britain.

Improvement in efficiency in delivering enhancements and renewals can be significantly improved through the implementation of requirements management which will enable a clear definition of scope for programmes and projects.

A new approach on how to specify requirements is being developed and is set out in this section. It is expected that this new approach will be applied to all renewals and enhancements planned from 1 April 2014 onwards.

The Project Requirements Specification (PRS) is to be replaced by three new requirements documents to be used sequentially as the project passes through various stages:-

- Client Requirements Document (CRD)
- Route Requirements Document (RRD)
- Detailed Route Requirements Document (DRRD)

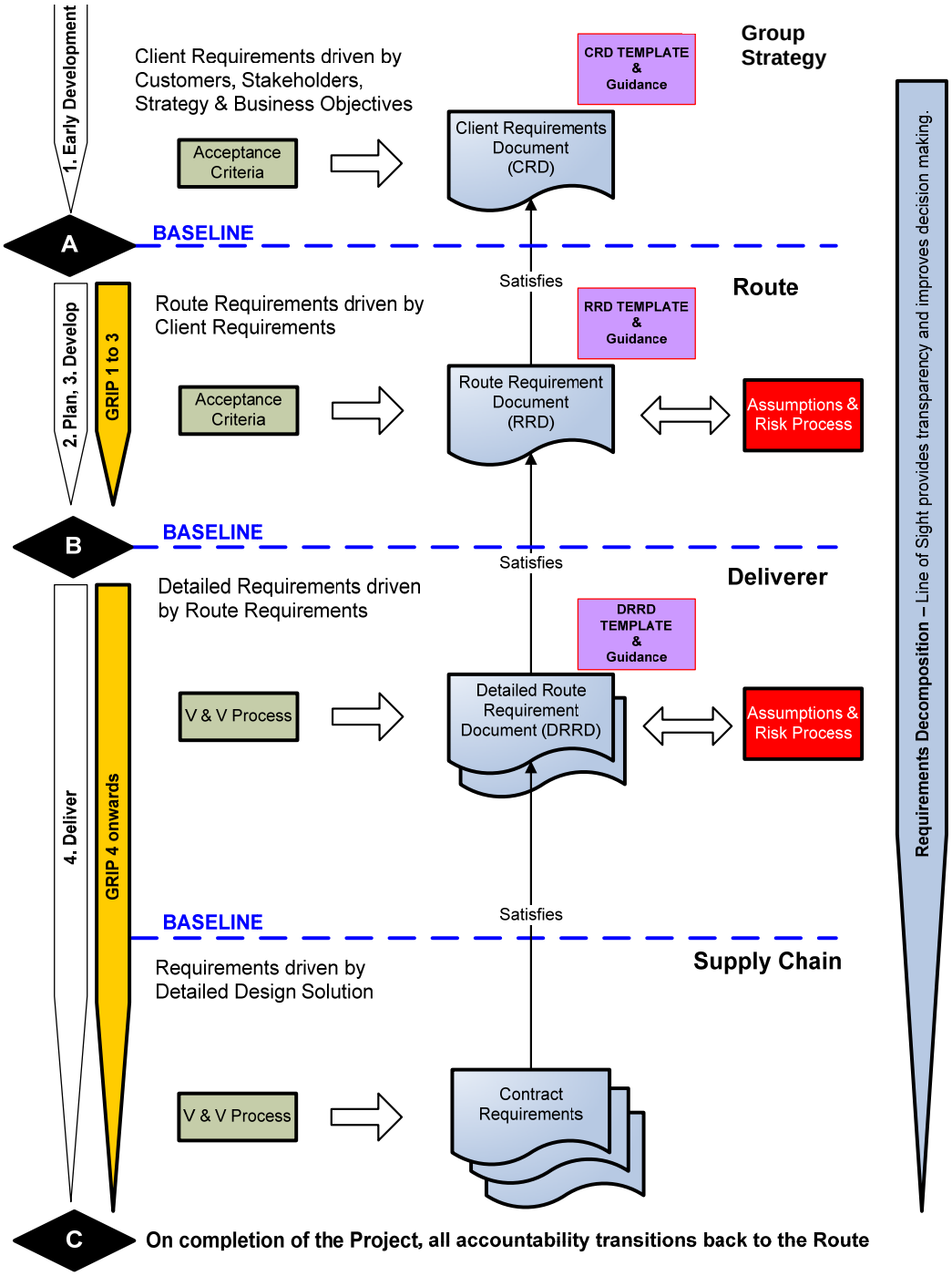
These new products will be produced by:-

- The Client, Group Strategy: Accountable for the development and management of the high level requirements which must be defined and captured in the Client Requirements Document (CRD)
- The Routes: Accountable for the development and management of the route requirements which must be defined and captured in the Route Requirements Document (RRD)
- The Deliverer (e.g. Infrastructure Projects): Accountable for the development and management of the detailed requirements which must be defined and captured in the Detailed Route Requirements Document (DRRD). This will include detailed engineering specifications

Templates and Guidelines will be provided via Connect, Communities, Requirements Engineering page. The Requirements Engineering page will also provide links to other useful documents.

Figure 12.3 shows the new requirements products and the hierarchy which will enable requirements management processes to be applied in order to achieve the benefits and the value for money (VfM) that our customers and stakeholders are seeking.

Figure 12.3 Requirements Hierarchy and Decomposition



A, B and C represent the transition points which dictate the transition of accountability through the organisation. At these transition points the requirements documents are baselined and any change to the baselined documents will be managed through a formal change control process. The GRIP stages shown are illustrative as the transition points A, B and C are to take place at stages to be agreed between the parties.

12.9 Group Strategy

The Group Strategy Client has the accountability to set clear high level requirements, i.e. needs and aspirations. These high level requirements will be captured in the Client Requirements Document (CRD). This document is created in collaboration with the stakeholders responsible for setting the objectives for the railway across the country. The development of these requirements will continue up to transition point A where the CRD will be formally issued (baselined). At this transition point the accountability for the project will be transferred to the Route.

The Group Strategy Client defines the high level needs to achieve the aspirations defined in the network strategies. The needs (i.e. requirements) must state the expected performance, capacity and reliability, and have defined, clear acceptance criteria. In addition, the Client must clearly identify any assumptions (and associated risks), constraints (including where appropriate the preferred solution) and also the interdependencies with other projects and route enhancements.

A typical example of a CRD requirement is as follows:-

Example 1 (Enhancement Scenario)

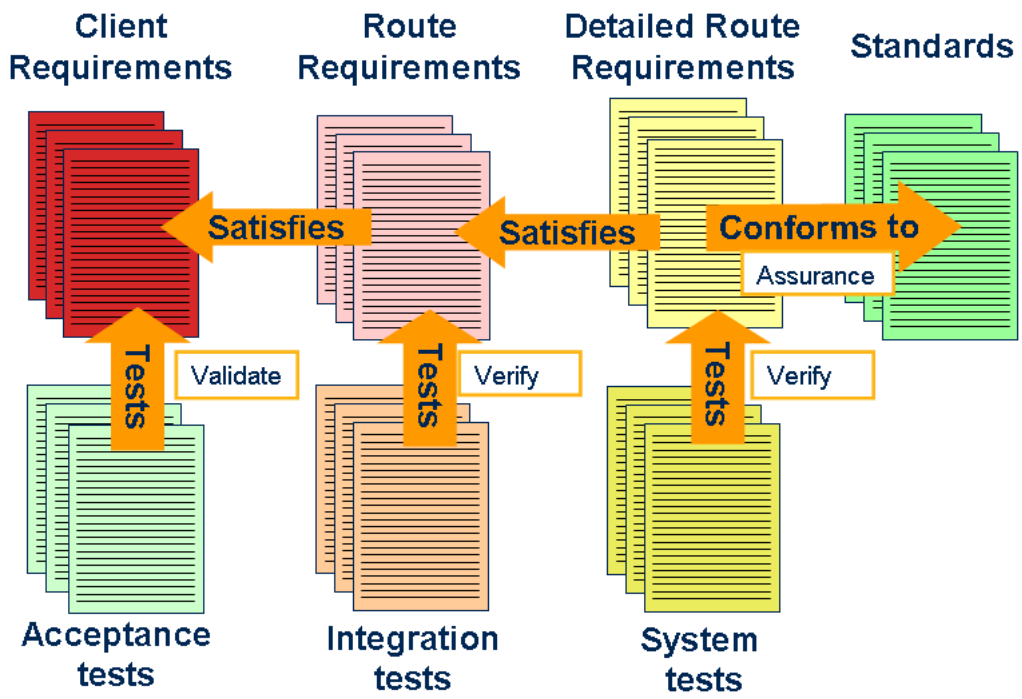
- Client Requirement [CR-001]: By 31 December 2019: Increase the seated passenger capacity for trains on route xyz arriving at their London terminal between 08.00 and 08.59 by 500 each working weekday.
- Acceptance Criteria: Number of train seats on route xyz, arriving at their London terminal between 08.00 and 08.59 each working weekday is ≥4,750 (4,250 currently) from 1st January 2020.
- Source: Route Utilisation Strategy – Southern

It is important that the requirement text is unambiguous and clearly specifies the outcome to be achieved, including in this particular example the date. This will enable decomposition to lower level requirements (refer to Example 2 and Example 3) which will be defined in the Route Requirements Document (RRD) and the Detailed Route Requirements Document (DRRD). By specifying acceptance criteria it will enable the Client to verify that the requirement can be satisfied by lower level requirements and its validation achieved at completion of the works.

The level of detail contained in the requirements documents will develop as the programme/project develops and passes from the Group Strategy Client to the Route Client to the Deliverer. As these requirements decompose into detailed requirements it is important to ensure that the original Group Strategy Client's requirements are still being fulfilled. Requirements traceability is an essential activity that must be performed in order to establish the relationship between requirements at different levels and demonstrate that the lower level requirements (detailed requirements) are consistent with the high level requirements. Traceability can be easily achieved when requirements are developed in a top-down approach and by implementation of a specific hierarchy as shown in Figure 12.3.

Figure 12.4 shows how traceability is achieved at the different levels of the requirements hierarchy.

Figure 12.4 Traceability



In some circumstances it is acceptable for a solution to be specified for a renewal, for example, where a detailed assessment has been already undertaken to demonstrate whole life cost trade offs. Evidence should be provided for the solution to maintain the engineering integrity of the renewal works.

It is very important that as part of the requirements development phase the acceptance criteria are clearly written and understood, as it will be the responsibility of the Route and then of the Deliverer to prove that such acceptance criteria have been achieved.

12.10 The Route Client

At transition point A, accountability is transferred from the Group Strategy Client to the Route Client.

The Client Requirements Document (CRD) is submitted to the Routes and will form a 'contract' between the two organisations. The Routes, being a stakeholder, will formally accept and sign the CRD provided that clear acceptance criteria have been identified for each requirement stated in the CRD. This will enable the Routes and subsequently the Deliverer to provide the necessary evidence to demonstrate that the requirements have been satisfied.

Between transition point A and transition point B the Route is accountable for the definition of the Route requirements. These must be defined in the Route Requirements Document (RRD).

The Route remains at all times accountable for achievement of the outputs and realisation of the business case. The technical solution development will be the responsibility of the Deliverer (under Route approval).

A typical example of an RRD requirement is as follows:-

Example 2 (Enhancement Scenario)

- Route requirement [RR-0016]: The capability on route xyz shall be increased to enable 12 car trains to run (instead of 8 cars as now) from station A to the London terminals, with stops at stations B, C and D, by 31 December 2019
- Acceptance Criteria: Infrastructure changes made, all approvals achieved, and 12 a car train has run from station A to the London terminal, with stops at stations B, C and D by 31 December 2019.
- Source: Client Requirement [CR-001]

Note that the Route Requirement [RR-0016] in Example 2 does not fully satisfy the parent (source) requirement [CR-001]. There will be a number of route requirements which will need to be defined in order to achieve full satisfaction of the parent (source) requirement [CR-001].

In particular circumstances where the Route wishes to specify a solution (a simple renewal for instance) the performance should still be defined with the detailed requirements where appropriate. Part of the reason is that there may be new ways of achieving the performance requirement that represent better VfM. It is unlikely that a renewal would provide a 'like for like' solution hence statements like, 'replace asset to comply with standards' are too vague.

Figure 12.5 shows the requirements decomposition and satisfaction flow.

12.11 The Deliverer

At transition point B, accountability for design and construction is transferred from the Route to the Deliverer.

The Route Requirements Document (RRD) is submitted to the Deliverer and will form a 'contract' between the two organisations. The Deliverer will formally accept and sign the RRD provided that clear acceptance criteria have been identified for each requirement stated in the RRD. This will enable the Deliverer to provide the necessary evidence to demonstrate that the requirements have been satisfied on completion and handback.

The Deliverer is responsible for decomposing the Route requirements to a greater level of detail and for producing the Detailed Route Requirements Document (DRRD). The Deliverer then submits the DRRD to the Route Client for approval and acceptance. Developing the technical solution design is the responsibility of the Deliverer as well as providing the evidence (through verification and validation) that the solution satisfies the requirements set out in the RRD.

The level of detail in the requirements documents increases from the initial set of requirements defined by the Group Strategy Client, then the Route, and finally the Deliverer, whilst maintaining a 'line of sight' (i.e. traceability between requirements) as shown in Figure 12.3.

A typical example of a DRRD requirement is as follows:-

Example 3 (Enhancement Scenario)

- Detailed Route Requirement [ORR-0021]: The platform extensions at stations A, B, C and D on route xyz shall be constructed using pier and plank construction.
- Acceptance Criteria: As built drawings for platform extensions at stations A, B, C and D show pier and plank construction.
- Source: Route Requirement [RR-0016]

Again, please note that the Detailed Route Requirement in Example 3 does not fully satisfy the parent (source) requirement [RR-0016]. There will be a number of detailed route requirements which will need to be defined in order to achieve full satisfaction of the parent (source) requirement [RR-0016].

Figure 12.5 shows the requirements decomposition and satisfaction flow. Note that the level of decomposition will increase when moving from left to right. Satisfaction is achieved through analysis of the decomposed requirements looking back at the parent requirement. In the example shown CR-001 will be satisfied by four Route requirements, whilst RR-0004 will be satisfied by the successful delivery of five Detailed Route Requirements.