

Schedule 10.2 – Programme and Project Lifecycle

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1 Introduction

1.1 Scope and Purpose

1.1.1 TTL delivers a range of key services for Customers through this Contract, other contracts with Third Parties and directly itself. In responding to changing Customer and business needs TTL also manages a portfolio of programmes, projects, changes and installations work delivering new services and enhancing existing services.

1.1.2 This Schedule 10.2 (Programme and Project Lifecycle) sets out:

- (a) the requirements for the Contractor to define and describe the project management processes and procedures that the Contractor implements to ensure successful planning, management and delivery of Programmes and Projects;
- (b) the requirements and principles for designing, developing and/or integrating Changes delivered as a Project or through a Programme;
- (c) the requirements and principles for testing and assuring any resulting Changes from Programmes and Projects meet TTL's needs and are functioning as expected;
- (d) the Documents to be produced by the Contractor in relation to Programmes and Projects; and
- (e) the processes for reporting on and review of Programmes and Projects.

1.1.3 The objectives of this Schedule are to ensure that:

- (a) the Contractor has adequately planned and resourced each Project and Programme and that the Contractor is able to achieve the respective Project and Programme deadlines;
- (b) the Contractor has adequately planned and resourced its Programme Portfolio, as well as monitored, identified and addressed any constraints and conflicting demands;
- (c) TTL is provided with detailed and timely information in order to plan and resource its obligations under the Contract and manage its interactions with its stakeholders;
- (d) the Contractor designs, tests, integrates and deploys each Project and/or Programme to meet its Service Levels and other obligations under the Contract;
- (e) the Contractor undertakes installation works to the applicable Standards, and with minimum disruption to TTL, its Customers, and the activities of Third Parties;
- (f) TTL is able to effectively manage the interaction and impact of Projects on other projects, systems and services; and
- (g) Changes will be brought safely into operation with minimum inconvenience to Customers and Operator Personnel.

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- 1.1.4 The principles that TTL requires for Change Management and the Contractor's obligations in relation to the implementation of Changes are set out in Schedule 10.1 (Change Management).
- 1.1.5 The requirements for the Contractor in its role as Systems Integrator are set out in Schedule 7.1 (System Integration Overview), Schedule 7.2 (System Integrator) and Schedule 7.3 (System Interfaces).

2 Guiding Principles

- 2.1.1 TTL shall have the right to commission projects or programmes from the Contractor, any member of the TTL Group and any other Third Party at TTL's sole discretion. Projects to be delivered by the Contractor may form part of a programme which contains projects being delivered by TTL or Third Parties and which is managed by either TTL or the Contractor.
- 2.1.2 The Contractor shall manage and deliver such Projects and Programmes and any other work it may itself commission in connection with the System and/or the Services as Projects and Programmes that shall be structured according to the following three levels:
- (a) any sequence of activities which results in a Change other than a Change that is solely a Related Change, Corrective Maintenance and Preventative Maintenance, whether initiated by TTL through a Variation or by the Contractor through a Project Description, shall be a "**Project**";
 - (b) since Projects may interact or be inter-dependent the Contractor shall manage each Project individually and also as an overall programme containing interrelated Projects, which can be delivered by the Contractor and / or any Third Party, as commissioned by TTL (a "**Programme**"); and
 - (c) the Contractor shall manage all the activities, Projects and Programmes it is leading, as a portfolio of delivery, taking into account resource constraints and conflicting demand for delivering this work (the "**Programme Portfolio**").
- 2.1.3 The Contractor's obligations in regards to Projects, Programmes and the Programme Portfolio are outlined in this Schedule. The Contractor shall Assure TTL how its Project and Programme management approaches fulfil the obligations set out in this Schedule through the Project Processes Plan. The approaches and processes that TTL has currently adopted are described in this Schedule to provide guidance for the Contractor when providing TTL this Assurance.
- 2.1.4 The Contractor shall adequately apply and scale the principles and requirements outlined in this Schedule to its Projects and Programmes based on the risk and size of the Project and/or Programme, and shall Assure TTL that it has the appropriate level of governance and control. In practice, this shall include proposals for efficient ways of working, including, but not limited to:
- (a) governance may be provided by an individual for small Projects whilst complex Projects may require a board of various members;
 - (b) Projects of similar scope may be reviewed within one meeting rather than in individual review meetings; or
 - (c) resources may be shared across (a group of small) Projects to provide synergy.

Initiation by TTL

- 2.1.5 Other than for Fares Revisions, Projects and Programmes initiated by TTL shall be implemented as a Variation in accordance with the Variation procedure set out in Schedule 12.3 (Contract Variation Procedure). In response to a TTL Variation Notice, the Contractor's Proposal shall contain a Project Description, outlining how it will deliver the Project requirements described in the Variation.
- 2.1.6 Fares Revisions shall be managed in accordance with Schedule 10.3 (Fares Revision).

Initiation by the Contractor

- 2.1.7 Where the Project or Programme is initiated by the Contractor, the Contractor shall prepare a Document for TTL, outlining the purpose, objectives, scope and requirements for design, testing, integration, deployment and operations (the "**Project Description**"). The Contractor shall submit the Project Description to TTL in accordance with the Submissions Procedure set out in Schedule 11.1 (Document Management).
- 2.1.8 The Contractor shall also confirm to TTL in the Project Description whether the proposed Programme or Project will result in a Technical Change, in accordance with Schedule 10.1 (Change Management), and shall assess the potential impact of the Technical Change to agree with TTL the required Assurance Level, in accordance with Schedule 9.1 (Technical Authority).

General

- 2.1.9 The Contractor shall ensure that each Project has a designated individual, whose identity shall be communicated to TTL in advance of the Project commencing, who is responsible for the delivery of the Project to time and for reporting on progress of the Project (the "**Project Manager**").
- 2.1.10 TTL shall appoint a designated individual to co-ordinate TTL Group's activities associated with the Project and oversee the Contractor's delivery of the Project (the "**TTL Project Manager**"). The Project Manager shall work with the TTL Project Manager on a daily basis on the Project.
- 2.1.11 Unless otherwise stated by TTL, the Contractor shall lead a Programme however TTL shall have the right (at its sole discretion) to lead a Programme itself, or appoint a Third Party to lead a Programme.
- 2.1.12 Where the Contractor takes the overall lead of a Programme it shall appoint a designated individual, who is accountable for leading and managing the Programme from strategy to successful delivery. This designated individual shall ensure effective co-ordination of the relevant Project(s), consider their interdependencies and risks and oversee the overall delivery of the Programme (the "**Programme Manager**"). The identity of the Programme Manager shall be communicated to TTL in advance of the Programme commencing. The Programme Manager shall also oversee and ensure the successful delivery of all Projects related to the Programme, which can be delivered by the Contractor and/or any Third Party.
- 2.1.13 TTL shall appoint a designated individual, who oversees TTL Group's delivery of Projects associated with a Programme, and oversees the Contractor's delivery of Projects related to the Programme (the "**TTL Programme Manager**").

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- 2.1.14 The Programme Manager shall work with the TTL Programme Manager on a regular basis to review and report on the progress of the Programme and associated Projects. The Programme Manager shall also act as a channel for escalation for the Project Managers and the TTL Project Managers.
- 2.1.15 The Contractor shall appoint a Programme Portfolio Manager, in accordance with Schedule 8.1 (Organisation & Governance), to lead and oversee the Programme Portfolio.
- 2.1.16 The Contractor shall plan, resource, manage risk and report to TTL on all its Projects, Programmes and the Programme Portfolio as set out in this Schedule and support TTL's internal governance and Programme and Project management processes as reasonably requested by TTL from time to time.

3 Project Management

3.1 Project Management Approach

- 3.1.1 The Contractor shall Assure TTL that its Project management processes and procedures shall:
- (a) provide the required Assurance as set out in this Schedule, and in accordance with the agreed Assurance Level for a Project;
 - (b) include mechanisms and methods to control a Project as it progresses through its lifecycle from initiation to close, and to Assure TTL that it is on track to deliver the required outcomes;
 - (c) provide an increasing level of detail and Assurance of the resulting Change meeting the requirements set out in this Schedule, as it progresses through design, build, test, integration, deployment and operation; and
 - (d) provide similar control and consistency in managing and delivering Projects as the TfL Pathway does.
- 3.1.2 To provide the required control and Assurance within the TTL Group, TTL has adopted a staged approach using gates and reviews for managing programmes and projects (the "**TfL Pathway**"), which is an integrated and consistent framework with the clear objective to provide the tools for delivery teams and their stakeholders to work effectively. In the TfL Pathway, each project will typically follow the six stages of a project lifecycle, as follows:
1. *Outcome Definition* – establishing the outcomes and benefits that a project will deliver;
 2. *Feasibility and Procure* – determining whether the outcomes and benefits are achievable, the options for their delivery and the option that will deliver them for the best value;
 3. *Concept Design and Contract Award* – defining the design principles, freezing the scope of the project and awarding the work to the best option for delivery;
 4. *Detailed Design* – producing a detailed design that delivers the required outcomes;
 5. *Delivery* – building the physical outputs of the project, confirming user assurance and handing the outputs over into operational / business and maintenance, including necessary supporting documentation; and
 6. *Project Close* – ensuring the project is closed in a controlled manner.
- Stages can be combined based on the nature and type of the project. The decision of how a project is progressing through the stages and stage gates is made in consultation with TTL and relevant stakeholders (including the Contractor if applicable), and with the agreement of the Sponsor of the Project.

3.1.3 In the TfL Pathway methodology, TTL will typically request input from the Contractor at various stages, including:

- (a) at *Stage 2 – Feasibility and Procure*, TTL may issue a Variation for the Contractor to complete a design study or option analysis;
- (b) at *Stage 3 – Concept Design and Contract Award*, the Contractor may be requested to submit relevant information in response to a Variation, enabling TTL to commission the work with the Contractor;
- (c) at *Stage 4 – Detailed Design*, the Contractor shall outline the detailed design of the solution, as well as its approach to develop, test and integrate the solution and manage its delivery;
- (d) during *Stage 5 – Delivery*, Contractor shall Assure TTL that it is on track to deliver the required outcomes as agreed for the Project; and
- (e) at *Stage 6 – Project Close*, the Contractor shall Assure TTL the agreed delivery work has been completed and the Project is closed down in a structured and controlled manner.

3.1.4 At the end of each stage, the TTL Project Manager determines whether sufficient Assurance has been provided that:

- (a) the activities and Project reviews within the gate have been successfully delivered;
- (b) the Products and outcomes resulting from the gate meet the agreed TTL requirements and expectations; and
- (c) the Project is ready to proceed to the next stage.

3.2 Project Processes Plan

3.2.1 The Contractor shall prepare a plan which shall set out its full project management methodology for the Contract (the "**Project Processes Plan**") and shall submit this plan to TTL for Assurance on the Service Commencement Date.

3.2.2 The Contractor shall ensure that the Project Processes Plan includes:

- (a) an overview of the Contractor's project management methodology covering each main stage of a Project through to delivery;
- (b) Assurance for TTL that the Contractor's methodology has similar stages to the TfL Pathway for a Project lifecycle with formal reviews and/or gates through which Projects progress from one stage to the next;
- (c) the approach to be adopted for planning, monitoring, reporting and rescheduling Projects throughout the Term;
- (d) the systems to be adopted for preparing, presenting and updating Projects;
- (e) the systems for monitoring and reporting on progress of Projects;
- (f) the Contractor's methodology for developing designs for Projects;

- (g) processes and procedures for:
 - (i) managing Projects in a staged approach, providing opportunities (e.g. stage gates) for regular Assurance and intervention;
 - (ii) health and safety;
 - (iii) quality control and Assurance;
 - (iv) planning and executing preparatory work and Site surveys;
 - (v) establishing temporary Site access arrangements;
 - (vi) obtaining required permits and regulatory approvals;
 - (vii) installation, deployment, commissioning and handover;
 - (viii) decommissioning and stopping systems and services;
 - (ix) consultation and communication with all parties affected by the installation works; and
 - (x) environmental protection (including sustainability);
 - (h) details of the installation team structure, roles and responsibilities for Projects;
 - (i) details of contingency planning (including recovery of the existing System and/or the IRC System (where the Project may affect one or more of the Related Systems), due to an unexpected failure during installation of new works or decommissioning of existing systems) for the installation of Projects;
 - (j) the rationale behind all testing for Projects whether the testing is carried out on or off Site;
 - (k) the processes the Contractor will employ in planning, preparing, and executing testing and for recording, documenting, and presenting the test results including how the testing regime will progress from individual unit tests through to functional and integrated testing of the System and/or the IRC System;
 - (l) details of the specific arrangements regarding communications with any Third Parties, including Regulatory Bodies, and the means of discerning, engaging, and documenting their required level of involvement in testing and responses; and
 - (m) details of the specific arrangements regarding communications with any Related Contractors.
- 3.2.3 Where appropriate the Contractor shall include in the Project Processes Plan cross references to other plans that it is required to prepare and submit under the Contract.
- 3.2.4 The Contractor shall include within the Project Processes Plan a project change control procedure that will be applied to each Project. This project change control procedure shall include processes for:
- (a) recording requested changes to the Project scope or programme from whatever source;

- (b) reviewing the requested changes to a Project;
 - (c) deciding on the course of action to be taken in relation to requested changes to a Project; and
 - (d) reporting progress on the project change control procedure.
- 3.2.5 The Contractor shall keep TTL informed of all proposed Project changes through the Project and/or Programme Review Meetings.
- 3.2.6 The Contractor shall review and issue the Project Processes Plan at least every six (6) months following the Service Commencement Date and where the Contractor fails to do so it shall prepare and submit a Corrective Action Plan in accordance with Schedule 12.4 (Contract Management).

3.3 Project Governance

- 3.3.1 TTL projects are governed by a combination of boards and reviews. The board structure and reviews required are defined and agreed as part of planning the project. Where TTL initiates a Project by Variation it shall set out the required governance in the TTL Variation Notice.
- 3.3.2 Where the Contractor initiates a Project, the Contractor shall propose a governance structure in the Project Description and shall Assure TTL that the proposed level of governance is sufficient for the scale and risk of the Project.
- 3.3.3 The Contractor shall adhere to and comply with the governance model and processes agreed for a Project, including, as a minimum, appointing a body or an individual (such as the Sponsor) who shall be accountable for the success of the Project and the decision-making body for the Project – but can delegate responsibility to the Project Manager subject to the tolerances and change control approaches (the "**Project Board**").
- 3.3.4 The Contractor shall Assure TTL that the Contractor has the required governance and processes in place within its organisations ensuring the required Assurance can be provided to TTL.

3.4 Project Review Meetings

- 3.4.1 The Contractor's progress on developing the designs and plans and delivering the outputs in relation to any Project shall be reviewed by TTL at the relevant Project Review Meeting and in accordance with the provisions of Schedule 9.1 (Technical Authority).
- 3.4.2 The Project Manager for each Project shall attend a four (4) weekly meeting with TTL (the "**Project Review Meeting**") for each Project. The agenda for each Project Review Meeting shall include a discussion of the Project Report plus other issues as deemed necessary by the Project Manager and TTL Project Manager. Typically, Projects of similar scope (for example installation works) will be covered by one Project Review Meeting.

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- 3.4.3 The TTL Project Manager shall prepare the meeting agenda for and chair all Project Review Meetings. At the end of each Project Review Meeting there shall be an agreed set of actions which TTL shall use reasonable endeavours to circulate within twenty four (24) hours of the meeting and, where necessary, TTL shall subsequently produce formal minutes which TTL shall use reasonable endeavours to circulate within three (3) Business Days of each Project Review Meeting.
- 3.4.4 The Project Manager shall keep the TTL Project Manager informed about any actual or potential delays in delivering the Project, as soon as these are identified, including details of the delay, the reasons for this, the impact it may have, and options for mitigating actions.
- 3.4.5 If a Project delay has an impact on related Projects and the associated Programme, the Contractor shall escalate this with the TTL Programme Manager to review this at the earliest possible opportunity.
- 3.4.6 All Project and Programme delays, mitigation actions and resulting impacts shall be covered at the relevant Project or Programme Review Meetings.

3.5 Key Project Products

- 3.5.1 The TfL Pathway includes a matrix listing the full set of Products and reviews for Programmes and Projects that TTL manages (the "**Product Matrix**"). The Contractor shall agree with TTL at the initial Project Review Meeting the Products to be produced for each Project or Programme, ensuring these Products provide the Assurance required for the Project.
- 3.5.2 The Contractor shall Assure TTL that for each Project a minimum set of Products is completed, as set out in paragraphs 3.6 to 3.8 of this Schedule. The Contractor shall also Assure TTL that mechanisms and processes are in place to produce, monitor, review, maintain and approve these Products.
- 3.5.3 The Contractor shall prepare all plans required under this Schedule using industry standard software and in accordance with the requirements set out in Schedule 11.1 (Document Management). The Contractor shall provide both paper and electronic copies of all plans required under this Schedule to TTL. The Contractor may change its planning software from time to time but shall not implement any change to such software without giving TTL twenty (20) Business Days' prior notice.
- 3.5.4 Electronic copies of the Programme Plan and Project Plans shall be made available in their native electronic format and/or an alternative format if agreed in writing by TTL.

3.6 Project Plans

- 3.6.1 The Contractor shall develop and submit to TTL a detailed Project Plan for each Project listing the activities agreed for the Project and the timescales for their completion (the "**Project Plan**").
- 3.6.2 Where TTL input in a Project is required then the Contractor shall either:
- (a) use the specified timescales as set out in the Contract within the Project Plan to describe TTL's required input; or

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- (b) request TTL to provide a timescale for its input, in which case paragraph 3.6.3 of this Schedule shall apply.
- 3.6.3 Where paragraph 3.6.2(b) of this Schedule applies and there are no specific timescales detailed within the Contract for TTL's required input, the Contractor shall provide full details of the TTL input it considers is required on the Project in sufficient time for TTL to properly consider such requirements. TTL shall notify the Contractor of the period of time the Contractor shall allow in its Project Plan for the TTL activity.
- 3.6.4 The Contractor shall ensure that Project Plans are developed using techniques that clearly identify the critical path and that information is presented in bar chart and tabular formats where appropriate or as requested by TTL.
- 3.6.5 The Contractor shall provide unrestricted access to any relevant facilities and Sites for the assessment of any Relief Event in accordance with Clause 46 (Relief Events). Relevant facilities include software, printers and plan versions related to any such Relief Event.
- 3.6.6 The Contractor shall ensure that all Project Plans shall as a minimum:
- (a) detail all stages of the Project in accordance with the project lifecycle as defined in paragraph 3.1 of this Schedule;
 - (b) detail the implementation activities covering:
 - (i) surveys;
 - (ii) preparatory works;
 - (iii) cabling or similar first stage works; and
 - (iv) system, device and equipment installation;
 - (c) detail activity dependencies;
 - (d) detail activity durations;
 - (e) detail any interface(s) with TTL and Third Parties, including Assurance events;
 - (f) include all TTL activities necessary to support the Contractor's implementation of a Project;
 - (g) include early start and finish dates for each activity related to delivery and implementation of the Project;
 - (h) show, where applicable, remaining float (i.e. the amount of time an activity can be delayed without impacting another activity or the project completion date);
 - (i) highlight critical paths;
 - (j) show activity durations to an appropriate scale;
 - (k) show key logic links;
 - (l) be capable of being filtered and sorted to facilitate easy identification of TTL's activities;

- (m) show the principal organisation responsible for each activity related to implementation of the Project including Category 1 Sub-Contractors;
 - (n) show the Contractor's interim Project events and delivery dates; and
 - (o) show milestone and payment milestone dates where applicable.
- 3.6.7 The Contractor shall use Project Plans for both forecasting and recording actual progress on Projects.
- 3.6.8 The Contractor shall make all Project Plans available to TTL as reasonably requested within the timeframe required by TTL.
- 3.6.9 Notwithstanding paragraph 3.6.8 of this Schedule, the Contractor shall make available to TTL within two (2) Business Days of each request any Project Plan where TTL requires such Project Plan to enable TTL to appreciate fully the extent of the Contractor's proposed sequence of working and progress, for TTL's audit purposes or to enable TTL to plan and operate its business.
- 3.6.10 At the start of each Project, the Contractor shall agree with TTL a version of the Project Plan that comprises the "**Baseline Project Plan**" against which all future progress shall be monitored and reported. Any revisions to a Baseline Project Plan shall be agreed between the Contractor and TTL at Project Review Meetings.
- 3.6.11 The Contractor shall formally review, update and reissue to TTL each Project Plan every four (4) weeks. The Contractor shall update each Project Plan using a 'time-now' analysis and shall share a common 'time-now' date with the Programme Plan. If the actual progress is ahead or delayed compared to the Baseline Project Plan then the Contractor shall ensure that the updated plan clearly identifies when the rescheduled activities are planned to occur.
- 3.6.12 Where the Contractor fails to review, update and reissue a Project Plan in accordance with paragraph 3.6.11 more than once in any three (3) consecutive Periods the Contractor shall prepare and submit a Corrective Action Plan in accordance with Schedule 12.4 (Contract Management).

3.7 Project Risk Register

- 3.7.1 The Contractor shall manage Project Risks in accordance with the requirements set out in Schedule 11.2 (Risk Management).
- 3.7.2 The Contractor shall Assure TTL that each Project has a Project Risk assessment and any Risks are documented in the Project Risk Register, as outlined in Schedule 11.2 (Risk Management).
- 3.7.3 The Contractor shall Assure TTL that for each Project Risk identified for a Project or Programme, the impact of the Project Risk is assessed, detailing the effect of the Project Risk on the Project outcomes and objectives. The Contractor shall Assure TTL that for each Project Risk identified for a Project, the impact of the Project Risk determines the likelihood for the Project Risk occurring.
- 3.7.4 The Contractor shall develop and maintain a register of all Project Risks associated with each Project (the "**Project Risk Register**"). The Project Risk Register shall form a sub-set of the Risk Schedule and comply with the requirements for the Risk Schedule set out in Schedule 11.2 (Risk Management) as appropriate.

3.7.5 Where requested by TTL via a Variation the Contractor shall provide TTL with, in addition to the requirements already set out in Schedule 11.2 (Risk Management), further Assurance for Significant Risks, including a risk analysis, covering:

- (a) a quantitative assessment of risk, in addition to qualitative assessment;
- (b) a quantitative cost risks analysis calculating the costs for implementing risk mitigation actions to be included in the Project budget;
- (c) a quantitative schedule risk analysis determining the confidence around Project delivery,

(a "**Quantitative Risk Analysis**")

3.7.6 The Contractor shall report on all Project Risks within each Project Report.

3.8 Project Reports

3.8.1 The Contractor shall submit a "**Project Report**" in accordance with this paragraph 3.8 for each Project to the TTL Project Manager for the relevant Project at least three (3) Business Days before each scheduled Project Review Meeting and where the Contractor fails to do so more than two (2) times in any six (6) consecutive Periods the Contractor shall prepare and submit a Corrective Action Plan in accordance with Schedule 12.4 (Contract Management).

3.8.2 The format of each Project Report shall be agreed with the TTL Project Manager for the Project prior to the first Project Review Meeting but will initially follow the following structure:

- (a) executive summary;
- (b) health and safety and environment (including sustainability);
- (c) Programme and Projects;
- (d) progress (against key activities identified in the Project Plan and Programme Plan);
- (e) Project Risks;
- (f) resourcing;
- (g) technical;
- (h) quality;
- (i) TTL operational interface;
- (j) Third Parties and interfaces;
- (k) major concerns and remedies; and
- (l) information required.

3.9 Project Closure

In order to close a Project:

- 3.9.1 the Contractor shall Assure TTL that the Changes are complete and fully meet the requirements and scope of the Project including delivery into service.
- 3.9.2 the Contractor shall Assure TTL that the required close down activities have been completed, ensuring, as a minimum, the following:
 - (a) all required Documents and information have been updated and deposited as required, including, but not limited to, training material, general arrangement drawings, technical and operating manuals, health and safety files in accordance with Schedule 11.1 (Document Management);
 - (b) all Data and information have been updated to ensure an accurate representation in the operational environment and current maintenance arrangements, such as Asset database, in accordance with Schedule 8.2 (Asset Management & Maintenance);
 - (c) Assets identified for decommissioning, have been taken out of operation and archived as agreed with TTL, and the Asset Data and information have been updated;
 - (d) all Project Documents have been completed and archived in accordance with the procedures set out in Schedule 11.1 (Document Management); and
 - (e) where TTL initiated the Project through a Variation, both the Completion of Work Certificate and the Implementation Phase Final Account have been submitted to TTL, in accordance with the requirements set out in Schedule 12.3 (Contract Variation Procedure).
- 3.9.3 the Contractor shall deposit IPR in accordance with paragraph 2.8 of Schedule 14 (IPR Management and Licences).
- 3.9.4 the Contractor shall Assure TTL that the Contractor Personnel are adequately trained to operate and maintain the Changes and/or New Services and New Technologies, in accordance with Schedule 8.6 (Training).
- 3.9.5 the Contractor shall update any training material and operator manuals and submit them to TTL enabling TTL and/or any Third Party to deliver the required training to Operator Personnel. The Contractor shall also, as requested, support and advise TTL in the delivery of training to Operator Personnel.
- 3.9.6 the Contractor shall Assure TTL that all Snags have been addressed and resolved, in accordance with paragraph 4.5 of this Schedule, prior to closing the Project. If Snagging has not been completed, the Contractor shall Assure TTL that a plan for closing out the Snags has been documented and agreed with TTL. This plan shall include the latest version of the register of Snags as well as details of roles and responsibilities for addressing any outstanding Snags and timescales within which the Snags will be resolved.

4 System Development and Decommissioning

4.1 Principles and guidance

- 4.1.1 Many Programmes and Projects will result in a Technical Change including, but not limited to:
- (a) development of new or improved Modules, Devices, Components and Services– designing, building, testing, integrating and implementing any Software, Hardware and applications; and
 - (b) system decommissioning of existing Modules, Devices, Components and Services– stopping and removing any Software, Hardware and applications.
- 4.1.2 The Contractor's processes for Technical Changes set out in the Project Processes Plan shall Assure TTL that:
- (a) proposed Technical Changes meet user's requirements and functionalities, with the exception of Related Changes in relation to which the Contractor shall advise TTL on the compatibility of such Related Changes with user's requirements and functionalities;
 - (b) proposed Technical Changes are assessed on their impact on existing systems and Services;
 - (c) the Technical Changes are consistent and compliant with TTL's System Design and Operating Principles and all relevant Standards set out in Schedule 9.3 (Standards);
 - (d) regimes and plans are in place and executed to ensure that the Technical Changes are functioning and can be operationally deployed and supported;
 - (e) Faults, System Faults and defects are identified effectively and efficiently to address and rectify these as soon as feasible; and
 - (f) completed system developments shall be integrated and proven to be operationally functioning in the live production environment.
- 4.1.3 The Contractor shall be responsible for the operational integration of all completed elements into a functioning Change, as set out in Schedule 7.2 (System Integrator).
- 4.1.4 The Contractor shall have the overall responsibility for the IRC System, and shall facilitate, manage and implement (as appropriate) Changes, in accordance with the processes set out in Schedule 10.1 (Change Management).
- 4.1.5 The Contractor shall allocate an Assurance Level to each Technical Change, resulting from a Project or Programme, in accordance with paragraph 6 of Schedule 9.1 (Technical Authority).
- 4.1.6 The Contractor shall include in the Project Processes Plan, described in paragraph 3.2 of this Schedule, its approach and processes for system development and decommissioning, outlining how the Contractor shall provide TTL the required Assurance as set out in this paragraph 4.

4.2 System Design

- 4.2.1 The Contractor shall, prior to commencement of *Stage 5 – Delivery*, submit information to TTL for Assurance that will:
- (a) demonstrate in broad terms what the overall design solutions and processes are for each Technical Change where appropriate and how they will be achieved;
 - (b) demonstrate the design is consistent with the System Architecture and System Design and Operating Principles and that it complies with all relevant Standards set out in Schedule 9.3 (Standards); and
 - (c) define, specify and describe all interfaces with TTL existing assets, systems and operations.
- 4.2.2 The Contractor shall submit selected relevant design information to TTL for Assurance in accordance with this paragraph 4.2.
- 4.2.3 For each Technical Change within each Project, the Contractor shall develop with TTL, in accordance with paragraphs 4.2.4 to 4.2.11 of this Schedule a list of the points in the Contractor's design development process at which the Contractor shall submit agreed design and development submissions to TTL for Assurance (the "**Assurance Milestones**").
- 4.2.4 The Contractor shall submit to TTL as part of the Project Description for agreement its recommendations for which designs should be reviewed by TTL in order for TTL to gain Assurance and those designs where a TTL input is required or the Contractor has obligations under the Contract.
- 4.2.5 Subject to paragraph 4.2.6, where possible or required by a Variation, the Contractor shall issue its Project Plan(s) to TTL prior to the commencement of *Stage 3 – Concept Design and Contract Award* to Assure TTL that it has built in sufficient time for TTL to view the designs, for TTL to provide information to the Contractor and for the Contractor to take into account TTL's comments on the submitted designs.
- 4.2.6 Where a Project is initiated through a TTL Required Variation, the Contractor shall issue its Project Plan(s) to TTL as soon as possible, but as a minimum within the timescale specified in the Variation.
- 4.2.7 For each Assurance Milestone, the Contractor shall submit a design submission in respect of each relevant design to TTL for Assurance which shall include:
- (a) a summary description of the design;
 - (b) a summary of the information being submitted;
 - (c) reference to the relevant parts of the System that the design covers including the affected Module from the MBS;
 - (d) detailed functional specifications including traceability matrices mapping individual detailed functional requirements back to high-level requirements;
 - (e) a statement regarding the completeness of the design; and

- (f) evidence that the submission has been through all the necessary internal Contractor checks and approvals.
- 4.2.8 TTL shall be entitled to review design submissions provided in accordance with paragraph 4.2.7 of this Schedule to assess the impact of the Contractor's proposals with respect to matters of:
- (a) safety during the installation, maintenance, operation and disposal phases of Asset lifecycle;
 - (b) functional requirements and designs;
 - (c) system designs and technical specifications;
 - (d) Standards and agreed quality criteria;
 - (e) certification and test strategy including test and Assurance plans;
 - (f) Software architecture, Software and/or Software licences;
 - (g) TTL operational requirements and interfaces;
 - (h) Customer Services;
 - (i) business process or workflow design for Changes to the System and/or the Services;
 - (j) aesthetics where applicable;
 - (k) other TTL contracts and commitments;
 - (l) existing TTL assets; and
 - (m) without prejudice to any of TTL's rights or remedies under the Contract, compliance with any specific Contract requirements.
- 4.2.9 The Contractor shall develop design documentation and information in sufficient detail and in such format so as to enable TTL to review all the matters set out in paragraph 4.2.8 of this Schedule.
- 4.2.10 The Contractor shall provide to TTL such other illustrations, computer simulations, samples, prototypes, mock-ups, traceability matrices and other documentation as are reasonably necessary for TTL's review in order to carry out Assurance as part of the Assurance Milestones.
- 4.2.11 If Third Party approvals or consents are required in respect of a design then the Contractor shall inform TTL in writing about which Third Parties have been consulted, how their comments have been addressed and whether there are any outstanding issues. Where appropriate, TTL may provide reasonable support to the Contractor, which will be defined and agreed between the Contractor and TTL before this support is required.
- 4.2.12 For TTL initiated Projects, TTL may require the Contractor to demonstrate a prototype or pilot for Changes to the System and/or the Services, as specified in the Variation. The purpose is to allow TTL to gain Assurance of the Changes to the System and/or the Services.

4.3 System and Functional Assurance Testing

4.3.1 The Contractor shall Assure TTL that Changes (other than Related Changes) are tested to ensure they are functioning and can be operationally deployed with minimal impact on the existing System and/or IRC System and Services, including the provision of, but not limited to, the following (where appropriate):

- (a) test strategy and plans;
- (b) test environments;
- (c) test harnesses;
- (d) testing tools and test data generation tools;
- (e) test scripts and test data; and
- (f) any additional information to provide TTL with the Assurance that the Contractor has met the testing requirements as set out in this paragraph 4.3,

and in the performance of its role as System Integrator the Contractor shall advise TTL on any appropriate testing that may be necessary or recommended in relation to Related Changes to enable the Contractor to assess the impact of that Related Change on the existing System and/or IRC System and Services.

4.3.2 In planning its test regime for each Project the Contractor shall ensure that the tests demonstrate as far as is reasonably practicable that:

- (a) the specified requirements set out in the relevant Variation and/or Project Description;
- (b) functional and design specifications;
- (c) service obligations; and
- (d) the System Integration Testing requirements set out in paragraph 4.6 of this Schedule,

can be delivered with the equipment, Software and processes provided. In practice, this shall include the provision of traceability matrices that shall map individual tests to requirements and functions to ensure that all requirements are delivered to specification.

4.3.3 Without prejudice to TTL's rights under Clause 65 (Records, Audit and Inspection), as part of the Assurance process TTL may attend selected tests and view selected test documentation. Prior to completion of *Stage 4 – Detailed Design*, the Contractor shall inform TTL of all tests scheduled and provide TTL with copies of all test documentation promptly on request following the conduct of each relevant test.

4.3.4 The Contractor's progress on testing shall be reviewed jointly with TTL at the Project Review Meetings described in paragraph 3.4 of this Schedule.

4.3.5 At least two (2) months (or such other period as may be agreed in writing by TTL, prior to the start of any testing) where applicable, the Contractor shall submit to TTL for Assurance a list of the test events in the Contractor's testing programme where the Contractor proposes that:

- (a) TTL attends and observes tests in order to gain Assurance;
- (b) TTL supports the Contractor's tests where reasonably requested by the Contractor to do so;
- (c) TTL participates in the tests where an end-user involvement is required; and
- (d) TTL attends and observes tests in order to meet the requirements of Schedule 10.1 (Change Management) where required under the applicable Variation or Change.

4.3.6 In identifying the Assurance Milestones for testing, the Contractor shall:

- (a) recommend which tests TTL should consider attending to satisfy its Assurance objectives;
- (b) notify TTL of those tests where a TTL operational input is required for off-Site tests;
- (c) notify TTL of those tests where the Contractor requires use of TTL's resources for on-Site tests;
- (d) comply with the requirements of Schedule 10.5 (Assurance); and
- (e) allow TTL sufficiently early observation of testing in order to Assure TTL that the requirements set out in the Variation, Project Description, design and functional specifications will be met.

4.3.7 TTL shall review the Contractor's recommendations provided in accordance with paragraphs 4.3.5 and 4.3.6 of this Schedule and shall:

- (a) inform the Contractor whether it agrees with the Contractor's recommendation; or
- (b) propose such further tests it reasonably requires to attend and for what purpose.

The Contractor shall review TTL's requests and incorporate TTL's reasonable requirements.

4.3.8 TTL's requirements for attending tests shall be reviewed at the Project Review Meeting or at such other meeting that TTL shall determine is necessary to discuss testing.

4.3.9 Notwithstanding any other provisions of this Schedule, TTL shall be entitled to attend any test where the output of any such test has a direct impact on any matters concerning:

- (a) safety;
- (b) functional requirements;
- (c) TTL operational interfaces;
- (d) Customers Services;

- (e) aesthetics where applicable;
- (f) other TTL contracts and commitments;
- (g) existing TTL assets; and
- (h) without prejudice to TTL's rights or remedies under this Contract, the Contractor's compliance with its obligations under Schedule 10.1 (Change Management) or any other requirements under the Contract.

4.3.10 The Contractor acknowledges that TTL will generally be entitled to attend any test that demonstrates the delivery of a specified requirement set out in the relevant Variation, Project Description, design and functional specifications and/or which has a direct impact on TTL Personnel, other agents or Customers (e.g. ETM) or equipment or processes which form part of a critical business system (e.g. revenue allocation).

4.3.11 Furthermore, TTL shall generally be entitled to attend any regression test which demonstrates that the existing functionality set out in the System Specifications and any previously implemented Variation are unaffected by the Technical Change.

4.4 Testing Procedures and Defect Management

4.4.1 The Contractor shall develop a suite of appropriate generic testing procedures for the implementation of a range of Projects which shall include details of each test method together with details of the Contractor's acceptance criteria, regression testing, format of test records and defect management and submit these to TTL for Assurance with the Project Processes Plan.

4.4.2 The Contractor shall ensure that the generic testing procedures developed in accordance with paragraph 4.4.1 of this Schedule shall be customised and Assured for each individual Project along with the specific test scenarios for the relevant Project no later than twenty (20) Business Days prior to any test being conducted.

4.4.3 Where the Contractor requires an input from TTL to conduct and complete a test then the Contractor shall give TTL reasonable notice and submit details of its requirements to TTL sufficiently far in advance of the test for TTL to properly consider them. Where this advance notice is not possible, the Contractor shall inform TTL as soon as it is aware of this required input from TTL, and shall agree with TTL feasible timescales for TTL to provide this input.

4.4.4 The Contractor shall comply with the relevant provisions of Schedule 8.4 (Access Management). The Contractor shall commence the planning of tests involving significant numbers of TTL Personnel and resources at least three (3) months, or such other period as agreed with TTL, in advance of the start of the relevant testing and the plans shall be finalised at least ten (10) Business Days before the planned start date of the test to allow TTL to properly brief the affected personnel and resource the tests as appropriate.

4.4.5 Subject to paragraph 4.4.3 of this Schedule, TTL shall use its reasonable endeavours to provide such reasonable facilities and TTL Personnel as reasonably required to enable the Contractor to conduct the tests requiring an input from TTL.

4.4.6 In planning its test regime for each Project the Contractor shall define and plan its approach for identifying and managing defects, System Faults and Faults.

- 4.4.7 The Contractor shall Assure TTL that throughout the build and development of the System components:
- (a) defects, System Faults and Faults are identified and documented as soon as feasible;
 - (b) all identified defects, System Faults and Faults are addressed and resolved as soon as feasible, unless otherwise agreed with TTL acting reasonably; and
 - (c) action plans are in place for addressing and managing any outstanding defects, System Faults and Faults.
- 4.4.8 The Contractor shall agree with TTL to adopt one consistent approach to categorise any identified defects, System Faults and Faults as follows:
- (a) P1 – Cannot perform any testing as the system is inoperable;
 - (b) P2 – Can perform some testing, though most parts of the systems are failing; there is a work around for this;
 - (c) P3 – This is a Medium priority issue and non-compliance to the requirement(s); however, resolution can wait until next planned cycle;
 - (d) P4 – This is a Low priority defect, e.g. a cosmetic issue; can be delayed for a later fix cycle; and
 - (e) P5 – This is an enhancement request and does not necessarily have a corresponding requirement; may or may not be fixed.
- 4.4.9 The Contractor shall ensure that all tests are documented and certified by the Contractor's duly authorised person designated as such by the Contractor in the relevant test procedure.
- 4.4.10 The Contractor shall report overall progress on testing for each delivery (e.g. interim and final releases), within the Project Report in accordance with paragraph 3.8 of this Schedule, including but not limited to:
- (a) the progress of delivering outputs, on track to meet or has met the user requirements and functionalities;
 - (b) the number of tests completed and evidence of the outcomes ensuring the delivered outputs are functional and ready to be introduced in to live operation, as set out in Schedule 7.2 (System Integrator) and Schedule 7.3 (System Interfaces);
 - (c) the number of defects, System Faults and Faults, identified and documented, categorised, resolved and outstanding; and
 - (d) the proposed actions to address and manage any outstanding defects, System Faults and Faults.

4.5 Snag Management

- 4.5.1 Issues, concerns or problems that do not materially affect the Contractor's ability to deliver the Services may be classed as "**Snags**". Where a Project is initiated by Variation the decision as to whether to classify such issues, concerns or problems as Snags shall be at TTL's sole discretion.
- 4.5.2 The Contractor shall maintain a list of all Snags and these shall be associated with an owner who shall be responsible for resolving the Snag.
- 4.5.3 The Contractor shall make the Snag list available to TTL at all times and shall present the Snag list to the Programme Portfolio Review Meeting on a quarterly basis.
- 4.5.4 In planning a Project or Programme, the Contractor shall agree with TTL at either the Programme Review Meeting or the Project Review Meeting (as appropriate) approaches and processes for addressing and resolving Snags, and shall provide TTL the Assurance that, as a minimum:
- (a) Snags are resolved as soon as feasible, and where possible before *Stage 6 - Project Close*; and
 - (b) where Snags cannot be resolved before *Stage 6 - Project Close*, the outstanding Snags and the rationale for them not being resolved are documented, and action plans are in place to resolve them in the most effective and efficient manner – for example, sharing resources with another Project.
- 4.5.5 TTL may at its discretion specify the approach and processes for Snag management in a Variation. The Contractor shall outline in its Project Description in response to the Variation how it will apply these requirements, as a minimum, and if applicable, shall propose any alternative approaches if beneficial for the Project and/or Programme.
- 4.5.6 Where the Contractor initiated the Project and/or Programme, the Contractor shall outline the approach and processes for Snag management in its Project Description.

4.6 System Integration Testing

- 4.6.1 The Contractor shall complete its responsibilities as the System Integrator, in accordance with the requirements as outlined in Schedule 7.1 (System Integration Overview), Schedule 7.2 (System Integrator) and Schedule 7.3 (System Interfaces).
- 4.6.2 The Contractor shall be responsible for integrating all components of any Technical Change, regardless of the party who has been commissioned to build and develop them as outlined in paragraph 2.1.1 of this Schedule, as well as installing and deploying the overall Technical Change.
- 4.6.3 The Contractor shall perform all necessary testing to ensure that any Technical Change is integrated with the IRC System ("**System Integration Testing**") in accordance with the testing procedures and test Assurance process defined in this paragraph 4.6 and shall:
- (a) designate from the Service Commencement Date an Integration Manager to liaise with TTL on all integration issues;

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- (b) perform Interface regression testing on Technical Changes to ensure that the changes made to Modules do not introduce defects to associated Interfaces;
 - (c) perform proactive integration and testing to ensure that integration is tested throughout the development and test process in relation to each Project, unless requested otherwise by TTL in the relevant Variation for the Project, and that potential integration issues are not deferred until System Integration Testing;
 - (d) provide Assurance to TTL that the proactive System Integration Testing in accordance with paragraph 4.6.3(c) of this Schedule is being performed by providing updates and, where appropriate, the integration test results to TTL and demonstrating the tests to TTL when requested by TTL;
 - (e) define entry criteria for System Integration Testing as part of a Project's Assurance Milestones to Assure the overall integration of the Technical Changes delivered by the Project and Assure TTL that the entry criteria have been met at least ten (10) days prior to commencement of the System Integration Testing;
 - (f) provide Assurance to TTL that the System Integration Testing has been performed through the:
 - (i) inclusion of integration Assurance Milestones for Projects;
 - (ii) traceability matrices mapping individual detailed test scenarios to functional requirements; and
 - (iii) provision of integration test scenarios, test results and demonstration of tests to TTL as part of the Assurance Milestones;
 - (g) perform Interface testing to ensure compliance with associated Interface Specifications; and
 - (h) accredit New Technologies and New Services that are to Interface to the System in accordance with Schedule 7.2 (System Integrator).
- 4.6.4 Prior to commencement of each phase of System Integration Testing the Contractor shall submit to TTL copies of all proposed tests for Assurance. Where the Contractor requires TTL or a Third Party to contribute to the list of tests including input on operational issues the Contractor shall identify where it would like such input and request such assistance at least four (4) weeks, or such other period as agreed with TTL, prior to commencement of System Integration Testing.
- 4.6.5 In planning its System Integration Testing the Contractor shall define and plan its approach for identifying and managing defects, System Faults and Faults during System Integration Testing, so TTL is Assured that throughout the System Integration Testing:
- (a) defects, System Faults and Faults are identified and documented as soon as feasible;
 - (b) any identified defects, System Faults and Faults are addressed and resolved as soon as feasible; and
 - (c) action plans are in place for addressing and managing any outstanding defects, System Faults and Faults.

- 4.6.6 The Contractor shall adopt the same consistent approach, as set out in paragraph 4.4.8 of this Schedule, to categorise any defects, System Faults and Faults identified during System Integration Testing.
- 4.6.7 The Contractor shall report overall progress on System Integration Testing for each delivery (e.g. interim and final releases), within the Project Report in accordance with paragraph 3.8 of this Schedule, including but not limited to:
- (a) the progress of integrated outputs and whether they are on track to meet or have met the requirements and functionalities;
 - (b) the number of tests required, the number of tests that have been scripted and the number of tests completed, the number of tests that were successful or unsuccessful and evidence of the outcomes ensuring the delivered outputs are functional and ready for operation;
 - (c) the number of defects, System Faults and Faults, identified and documented, categorised, resolved and outstanding; and
 - (d) the proposed actions to address and manage any outstanding defects, System Faults and Faults.
- 4.6.8 The Contractor shall review this progress with and report to TTL at the appropriate Project Review Meeting.

4.7 Technical Change Implementation and Service Readiness

Project Commissioning Plan

- 4.7.1 The Contractor shall, prior to any Technical Change implementation and deployment to operational use, prepare and submit to TTL for Assurance a "**Project Commissioning Plan**" in accordance with paragraph 4.7.2 of this Schedule in relation to each Project which shall cover the period between the completion of all off-Site and System Integration Testing and the start of operations. The Project Commissioning Plan shall define all the arrangements that need to be in place both within the Contractor's organisation, TTL's organisation and any relevant Third Parties' organisations for the Change implementation and operational use to take place and the responsibilities of the respective parties during this period.
- 4.7.2 The Contractor shall ensure that each Project Commissioning Plan shall include as a minimum:
- (a) details of the Technical Change being introduced;
 - (b) details of the process for Technical Change implementation and operational use including formal checks, controls and authorisations both within the Contractor's organisation, the TTL Group's organisation and Third Parties' organisations where appropriate;
 - (c) details of the proposed timing and phasing of how parts of the Technical Change at different Sites will be implemented and put into service;
 - (d) details of the documentation required to be in place (e.g. manuals) or to be updated, and the process for ensuring this occurs;

- (e) arrangements to ensure that equipment and systems are available and ready for use;
 - (f) details of the training of Operator Personnel;
 - (g) details of the implementation team covering roles and responsibilities of the Contractor, TTL and Third Party staff during the process;
 - (h) details of the potential impact on the System and/or the IRC System and the Services that will be modified or withdrawn during the implementation process;
 - (i) an assessment of the major risks to the success of the implementation process and the Contractor's contingency and mitigation plans for such risks; and
 - (j) details of the support the Contractor will give to the TTL Group and any relevant Third Parties post implementation and operational use.
- 4.7.3 Subject to the inclusion of the information set out in paragraph 4.7.2 of this Schedule, Project Commissioning Plans can be generic in content for each part of the System or Services. However, where Changes to parts of the System or Services are being installed and operated at different Sites and/or within different timescales, the Contractor shall provide additional information as an appendix to the relevant generic detailed Project Commissioning Plan and shall emphasise the special conditions applicable to each specific Site or operation.

Off-Site Testing

- 4.7.4 Prior to implementing Technical Changes the Contractor shall Assure TTL that all planned off-Site tests have been completed and documented, including:
- (a) submitting to TTL such test documentation as requested by TTL;
 - (b) providing evidence that all System components were certified or tested prior to implementation in the System.
 - (c) where the Contractor has been unable to complete all planned off-Site testing and proposes to carry out outstanding tests after implementation of Technical Changes, submitting to TTL a revised plan for testing together with justification for the delay and an impact assessment for this delayed testing.
- 4.7.5 Once the Contractor has Assured TTL that all off-Site testing has been completed successfully, and if applicable, any outstanding tests have been addressed appropriately, the Contractor shall, based on the Assurance Level, provide TTL with further Assurance, which shall include, but is not limited to, "**Site Vanguard Testing**", which tests the proposed Changes in a limited area of the live environment, ensuring they are ready for implementation on the IRC System and Services and to all Sites. The Contractor shall agree the details of the Site Vanguard Testing with TTL as part of the testing regime in the *Stage 4 - Detailed Design* stage of the Project.

System Assurance Certificate

- 4.7.6 Within five (5) Business Days of the successful completion of all tests in relation to a Project the Contractor shall issue a "**System Assurance Certificate**" to TTL. The System Assurance Certificate shall confirm that all relevant tests have been duly carried out and that the relevant part(s) of the System is safe and ready for bringing

into service. The System Assurance Certificate shall summarise the tests that have been carried out and be accompanied by key test results as appropriate. The Contractor shall Assure that any proposed Technical Changes resulting from the Project will be managed in accordance with Schedule 10.1 (Change Management), and submit specific relevant information to Assure TTL that the proposed Change can be installed and handed over to operational use with minimum impact to existing Systems and Services.

- 4.7.7 In planning and executing the implementation of a Technical Change, the Contractor shall ensure that TTL is able to maintain a seamless Customer service. If the Contractor considers that an adverse impact to maintaining such service is unavoidable, it shall consult with TTL and the relevant Operator Personnel at the Site in question immediately upon becoming aware of the possible problems to Customer service to develop and agree the arrangements necessary for the Contractor to put in place prior to the start of any such implementation works.

Safe System of Work

- 4.7.8 The Contractor shall prepare a Safe System of Work (SSOW) and supporting documents specific to each Site prior to commencing any activities on Site.
- 4.7.9 The Contractor shall ensure that each SSOW details as a minimum the Contractor's proposals for:
- (a) access onto TTL or Third Party premises including for the inspection of Sites;
 - (b) the setting up of temporary access, stores and similar facilities;
 - (c) definition and agreement on System locations;
 - (d) interface requirements with existing systems provided by TTL or Third Parties;
 - (e) the sequence and methods of delivery and installation;
 - (f) the Systems and equipment to be used (special conditions may apply depending on location) during installation;
 - (g) the services required of TTL, Interfacing Parties, Benefiting Parties or any other relevant Third Party (e.g. power, water);
 - (h) protection arrangements for:
 - (i) new systems and equipment when it is partly installed;
 - (ii) new systems and equipment where there is a delay to handing over to operational use; and
 - (iii) Assets, systems and Services where installation is not completed in a single visit;
 - (i) compliance with health and safety requirements (cross referenced to the Health and Safety Plan prepared in accordance with Schedule 8.5 (SQE));
 - (j) dealing with environmental issues (cross referenced to the Environmental Plan prepared in accordance with Schedule 8.5 (SQE));

- (k) maintaining quality (cross referenced to the Quality Plan prepared in accordance with Schedule 8.5 (SQE));
- (l) the completion, inspection and handback of an area or Site to TTL or a Third Party; and
- (m) the utilisation of resources including:
 - (i) names of staff;
 - (ii) responsibilities;
 - (iii) contingency plans for emergencies or delays; and
 - (iv) standby resources and materials.

4.7.10 The SSOW may be generic in content, subject to including the minimum proposals set out in paragraph 4.7.9 of this Schedule, where there is standardisation across several Sites. However, the Contractor shall provide additional information where special conditions apply to particular Sites or operations.

As Built Records

4.7.11 As part of each Project the Contractor shall prepare, maintain and update following any Project, Documentation and drawings in respect of each Site affected by such Project including as a minimum:

- (a) numbers, locations, logical and physical architecture of all Assets on the Site showing power and data connections and actual cabling routes;
- (b) structural and power information e.g. floor strengths and point loadings, power loading, voltages and cable types; and
- (c) Asset dimensions, weights and installation requirements,

(the "**As Built Records**").

4.7.12 The Contractor shall ensure that any discrepancy between designs and drawings (including previous As Built Records) and the actual situation at any Site is promptly resolved.

4.7.13 The Contractor shall arrange Site specific meetings as necessary with the appropriate entity in control of a Site and its staff in order to brief Operator Personnel on the installation plans and to reduce the risk of access being denied.

4.7.14 The Contractor shall prepare and submit the SSOWs and Project Commissioning Plans containing implementation activities to TTL for Assurance in preliminary form at least forty (40) Business Days, and in final form at least ten (10) Business Days, prior to the scheduled start date for the implementation works on Site or such other period as agreed with TTL. In relation to minor installation works, the Contractor shall plot such works on the Programme Portfolio Plan.

- 4.7.15 The Contractor shall ensure that, where agreed with TTL, any minor work is to be completed as "snagging" after completion of the main implementation and these shall be completed as soon as reasonably practicable or in accordance with the terms agreed as part of the consent to operate process set out in paragraph 4.8 of this Schedule.
- 4.7.16 The Contractor shall ensure that Contractor Personnel have completed such training in operating, supporting and maintaining the implemented Technical Change as required. The Contractor shall also update and submit all operating manuals and other relevant Documents to TTL, in accordance with the processes set out in Schedule 11.1 (Document Management).
- 4.7.17 As requested by TTL, the Contractor shall provide support and technical expertise to TTL in its delivery of training Operator Personnel, in accordance with the procedures set out in Schedule 8.6 (Training).

4.8 Early Life Support and Consent to Operate

- 4.8.1 Where required by TTL, prior to Project close the Contractor shall complete Early Life Support, for a period of time, agreed with TTL, during which the Project has been deployed and is supported in the live operational environment, including:
- (a) ensuring that TTL gains Assurance that the Technical Change is meeting the business requirements, Service Levels and functional requirements as set out in the relevant Variation;
 - (b) establishing suitable monitoring capabilities; and
 - (c) agreeing with TTL to address any remaining errors or deficiencies.
- 4.8.2 Where reasonably required by TTL prior to deployment of a Change or (new) Service (e.g. Fares Revisions, any System wide deployment or the introduction of a new Module or Service), the Contractor shall submit a **"Request to Operate Notice"** to TTL for Assurance and shall clearly identify:
- (a) which part of the Change or (new) Service is to be brought into use;
 - (b) the proposed date for the Change or (new) Service to commence; and
 - (c) any outstanding issues, Snagging items or defects and potential impacts.
- 4.8.3 The Request to Operate Notice shall be accompanied by the relevant System Assurance Certificate, the supporting documentation set out in paragraph 4.3 of this Schedule, any outstanding training materials or operator manuals, in accordance with Schedule 8.6 (Training), and any other outstanding essential operating records.
- 4.8.4 TTL shall review the Request to Operate Notice and the information submitted in accordance with the provisions of the Submissions Procedure of Schedule 11.1 (Document Management) and shall respond to the Contractor's Request to Operate Notice by either:
- (a) issuing a Consent to Operate Certificate;
 - (b) issuing a conditional Consent to Operate Certificate stating the conditions the Contractor shall comply with before TTL shall permit the proposed Change or (new) Service to be introduced; or

- (c) rejecting the Contractor's Request to Operate Notice by issuing a Corrective Action Notice in accordance with Schedule 10.5 (Assurance) stating the reasons for the rejection.

4.9 System Decommissioning

- 4.9.1 The Contractor shall plan and manage any System decommissioning as a Project or Programme, in accordance with this Schedule. The Contractor shall adhere to and comply with the same Assurance requirements, as set out for System development in this paragraph 4, with the exception of the requirements set out for Technical Change implementation in paragraph 4.7 of this Schedule and operations in paragraph 4.8 of this Schedule.
- 4.9.2 The Contractor shall Assure TTL that in designing and planning the decommissioning, test regimes and mechanisms are in place to ensure that the proposed decommissioning will not have an adverse impact on the IRC System and/or the Services. Where the proposed decommissioning will have an unavoidable adverse impact on the IRC System and/or the Services, the Contractor shall Assure TTL that it has assessed any resulting risks and defined an action plan to mitigate these risks.
- 4.9.3 The Contractor shall Assure TTL that the decommissioning shall be executed in an environmental and sustainable manner, in accordance with Schedule 8.5 (SQE).
- 4.9.4 Prior to executing the decommissioning, the Contractor shall complete testing and assessment to Assure TTL that the decommissioning does not have any adverse impact other than any adverse impact that has been agreed in advance with TTL.
- 4.9.5 The Contractor shall Assure TTL that any Assets and related documents are updated, in accordance with Schedule 8.2 (Asset Management & Maintenance). The Contractor shall also Assure TTL that any other relevant information and Documents are updated and submitted to TTL in accordance with Schedule 11.1 (Document Management).

5 Programme Management

5.1 Programme Management Approach

5.1.1 The Contractor shall be responsible for Programmes which includes inter-related Projects that TTL commissions to:

- (a) the Contractor itself;
- (b) a member of the TTL Group;
- (c) a Third Party; or
- (d) a mix of the above.

5.1.2 The Contractor shall Assure TTL that its Programme management processes and procedures shall:

- (a) include mechanisms and methods to oversee and co-ordinate related Projects as they progress through their lifecycle, in accordance with paragraph 3 of this Schedule, as well as to control the Programme as it proceeds through its lifecycle;
- (b) ensure System developments and/or decommissioning delivered as Projects are designed, built, tested, integrated and implemented in accordance with paragraph 4 of this Schedule;
- (c) provide the required Assurance requirements as set out in this paragraph 5, and in accordance with the agreed Assurance Level for a Programme; and
- (d) include the regimes and approaches to manage and control the interdependencies between Projects, ensuring each Project delivers the expected outcomes, as well as minimising adverse impact of Projects on each other and on existing Services and the IRC System and Interfacing Systems.

5.1.3 In order to provide such control and Assurance, as described in paragraph 5.1.2 of this Schedule, within the TTL Group, TfL Pathway defines a programme that will typically follow the four stage programme lifecycle:

- (a) *Identify Options* – looking at the programme from a high level, consider strategic fit, vision, costs, duration, risks and preparing for the future;
- (b) *Define* – exploring the options for delivering the required outcomes and benefits together with robust and detailed planning for delivery;
- (c) *Deliver Tranches* – implementing the governance strategies to ensure capability is delivered and aligned to organisational objectives; managing the projects (through the stages set out in paragraph 3.1.2); each programme will have one or more delivery tranches; and
- (d) *Close* – confirming ongoing support is in place; disbanding resources and infrastructure so that the programme does not drift into normal operations.

Schedule 10.2 – Programme and Project Lifecycle

- 5.1.4 The Contractor shall also include in the Project Processes Plan, as described in paragraph 3.2 of this Schedule, its programme management methodology, so that TTL shall be Assured the Contractor manages Programmes with similar control and consistency as TfL Pathway does. The Contractor shall prepare and submit to TTL the Project Processes Plan in accordance with paragraph 3.2 of this Schedule.
- 5.1.5 The Assurance requirements applied for Projects, as outlined in paragraph 3 of this Schedule, shall also broadly apply to Programmes, including, but not limited to:
- (a) the Contractor shall Assure TTL that for each related Project and Programme the Products are completed and Assured, as agreed with TTL, and shall prepare and submit these to TTL in accordance with the requirements as set out in Schedule 11.1 (Document Management);
 - (b) the Contractor shall Assure TTL that Project Risks for each related Project are managed in accordance with paragraph 3.7 of this Schedule;
 - (c) the Contractor shall Assure TTL that Project Risks are categorised and managed within each relevant Programme;
 - (d) the Contractor shall Assure TTL that all related Projects are closed before the Programme can be closed; and
 - (e) the Contractor shall close a Programme in the same way as Project closure, as outlined in paragraph 3.9 of this Schedule.
- 5.1.6 The Contractor shall fully explain to TTL any variances from the agreed Baseline Programme Plan and their effect on:
- (a) the agreed scope and requirements;
 - (b) the agreed success measures and business outcomes; and
 - (c) the agreed budget and completion date.
- 5.1.7 The remaining paragraphs in this paragraph 5 outline further details specific to Assurance for Programme management.

5.2 Programme Governance

- 5.2.1 All programmes in TTL are governed by a combination of boards and reviews. The board structure and reviews required are defined and agreed as part of planning the programme.
- 5.2.2 The Contractor shall adhere to and comply with the governance model and processes agreed for a Programme, including, as a minimum, appointing a body ensuring the Programme is delivering to time and cost, and focussing on the overall strategic benefit realisation ("**Programme Board**").
- 5.2.3 The Contractor shall Assure TTL that it has the required governance and processes in place within its organisations to ensure that it can provide the required Assurance to TTL.

5.3 Programme Review Meeting

- 5.3.1 The Contractor shall ensure that its Programme Manager attends a four (4) weekly meeting (the "**Programme Review Meeting**") with the TTL Programme Manager.
- 5.3.2 The TTL Programme Manager shall prepare the meeting agenda and chair each Programme Review Meeting. At the end of each Programme Review Meeting the Parties shall agree a set of actions which the TTL Programme Manager shall use reasonable endeavours to circulate within twenty four (24) hours of the meeting and where necessary the TTL Programme Manager shall subsequently produce formal minutes of the meetings which the TTL Programme Manager shall use reasonable endeavours to circulate within three (3) Business Days of the Programme Review Meeting.
- 5.3.3 The TTL Programme Manager shall have the right to convene additional meetings to discuss the Programme Plan or detailed Projects where the Contractor fails to provide sufficient Assurance to TTL in the Programme Report and at the Programme Review Meeting that it will achieve the Programme and Project dates and service deliverables. The Contractor shall ensure that suitably qualified Contractor Personnel attend all such meetings convened by the TTL Programme Manager.

5.4 Programme Communication

- 5.4.1 The Project Managers shall inform and escalate with the Programme Manager any delay with the overall Programme and/or with a related Project, that may also affect related Projects. The Project Manager shall include details about the delay, the reason for this delay, the impact on the Project, Programme and/or related Projects, and options for mitigation.
- 5.4.2 At the earliest possible time the Contractor shall discuss with the TTL Programme Manager the delays that have been identified for Projects and/or Programmes, as well as agree an action plan for any mitigation, rectification and/or escalation.
- 5.4.3 Where this delay has an impact on projects delivered by TTL and/or Third Parties, the appropriate TTL Project Manager shall be informed about the delays and the agreed action plans. The processes and responsibilities for this communication and TTL's support in this escalation shall be agreed between the Programme Manager and the TTL Programme Manager.

5.5 Programme Plan

- 5.5.1 The Contractor shall prepare and maintain a "**Programme Plan**" in accordance with this paragraph 5.5 and submit it to TTL for Assurance no later than three (3) Business Days prior to each scheduled Programme Review Meeting. . The Programme Plan shall provide an overview of all related Projects and be separated into logical and meaningful sections. The Contractor shall organise the Programme Plan to aid meaningful progress reviews with the TTL Programme Manager at the Programme Review Meetings.
- 5.5.2 The Contractor shall develop Programme Plans using techniques that clearly identify the critical path and the Contractor shall present the information in bar chart and tabular formats as agreed with TTL on a case by case basis.
- 5.5.3 The Contractor shall Assure TTL that all related Projects have a completed Project Plan, as set out in paragraph 3.6 of this Schedule.

5.5.4 The Contractor shall ensure that each Programme Plan shall as a minimum:

- (a) include all TTL activities necessary to support the Contractor's performance of the Programme and Projects delivery;
- (b) detail all stages of a Programme in accordance with the programme lifecycle as defined in paragraph 5.1.3 of this Schedule;
- (c) include early start and finish dates for each major Project activity related to a Programme;
- (d) show, where applicable, remaining float;
- (e) highlight critical paths;
- (f) show activity durations to an appropriate scale;
- (g) show key logic links;
- (h) show key interdependencies between Projects;
- (i) be capable of being filtered and sorted;
- (j) show the principal organisation responsible for each activity including Category 1 Sub-Contractors;
- (k) show the Contractor's interim Project and Programme events and delivery dates; and
- (l) show milestone and payment milestone dates where applicable.

5.5.5 The Contractor shall use Programme Plans for both forecasting and recording actual progress of Programmes and related Projects.

5.5.6 The Contractor shall make Programme Plans available to TTL as reasonably requested within the timeframe required by TTL.

5.5.7 Notwithstanding paragraph 5.5.6 of this Schedule, the Contractor shall make available to TTL within two (2) Business Days of each request any Programme Plan where TTL requires such Programme Plan to enable TTL to appreciate fully the extent of the Contractor's proposed sequence of working and progress, for TTL's audit purposes or to enable TTL to plan and operate its business.

5.5.8 Prior to commencement of any activities, at the start of each Programme, the Contractor shall agree a version of the Programme Plan that comprises the "**Baseline Programme Plan**" against which all future progress is monitored and reported. Any revisions to a Baseline Programme Plan shall be agreed between the Contractor and TTL at the Programme Review Meeting.

5.5.9 The Contractor shall ensure that Programme Plans shall be formally reviewed, updated and reissued every four (4) weeks using a 'time-now' analysis and sharing a common 'time-now' date with all the Project Plans, to be agreed with TTL. If the actual progress is ahead or delayed compared to the Baseline Programme Plan then the Contractor shall ensure that the updated plan clearly identifies when the rescheduled activities are planned to occur.

5.6 Programme Report

- 5.6.1 The Contractor shall prepare and submit progress reports on a Programme (the "**Programme Report**") in accordance with the requirements of this Schedule.
- 5.6.2 The Contractor shall submit Programme Reports to the TTL Programme Manager at least three (3) Business Days before each scheduled Programme Review Meeting.
- 5.6.3 The Contractor shall include in the Programme Reports details of the mitigating measures it has taken and will take to reduce or eliminate any delays to implementation of Projects.
- 5.6.4 The Programme Report format shall be agreed with the TTL Programme Manager prior to the first Programme Review Meeting but will initially follow the following structure:
- (a) executive summary;
 - (b) health and safety and environmental;
 - (c) Programme;
 - (d) related Projects;
 - (e) progress (against key activities identified in the Programme Plan);
 - (f) Project Risks;
 - (g) resourcing;
 - (h) technical;
 - (i) quality;
 - (j) TTL operational interface;
 - (k) Third Parties and interfaces;
 - (l) major concerns and remedies; and
 - (m) information required.

6 Programme Portfolio Management

6.1 Approach for Managing the Programme Portfolio

- 6.1.1 The Contractor shall Assure TTL that the Contractor adopts approaches and processes to manage the Programme Portfolio of work for which the Contractor is responsible.
- 6.1.2 The Contractor shall Assure TTL that its Programme Portfolio management shall:
- (a) include mechanisms and methods to oversee and co-ordinate the work the Contractor is contracted to deliver, including Projects and Programmes;
 - (b) adopt processes and procedures to control and manage this Programme Portfolio, providing the required Assurance as set out in this paragraph 6;
 - (c) ensure that its Programme Portfolio is planned and resourced sufficiently to deliver the agreed outcomes within time, cost and quality; and
 - (d) include the regimes and approaches to manage and control interdependencies and conflicting demand between Projects and Programmes.
- 6.1.3 The Contractor shall include in the Project Processes Plan, as described in paragraph 3.2 of this Schedule, its approach and methodology for Programme Portfolio management, and submit it to TTL for Assurance to show how the Contractor manages its Programme Portfolio within the resource constraints. The Contractor shall prepare and submit to TTL the Project Processes Plan in accordance with paragraph 3.2 of this Schedule.
- 6.1.4 The Assurance requirements applied for Projects and Programmes, as outlined in paragraphs 3 and 5 of this Schedule, shall also broadly apply to Assuring the management of the Programme Portfolio, including, but not limited to:
- (a) the Contractor shall Assure TTL that agreed Documentation has been prepared and submitted to TTL in accordance with the requirements as set out in Schedule 11.1 (Document Management); and
 - (b) the Contractor shall Assure TTL that all Risks related to the Programme Portfolio are identified, assessed, managed and addressed in the same way as Project Risks, as set out in paragraph 3.7 of this Schedule, and in accordance with Schedule 11.2 (Risk Management).

6.2 Programme Portfolio Review Meeting

- 6.2.1 The Contractor shall ensure that it attends a four (4) weekly meeting (the "**Programme Portfolio Review Meeting**") with TTL. The agenda for each Programme Portfolio Review Meeting shall include a discussion of the Programme Portfolio Report, the Programme Portfolio Plan plus other issues as deemed necessary by the Parties that are not already the subject of discussion in other meetings provided for under this Contract.

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- 6.2.2 The TCM shall prepare the meeting agenda and chair each Programme Portfolio Review Meeting. At the end of each Programme Portfolio Review Meeting the Parties shall agree a set of actions which the TCM shall use reasonable endeavours to circulate within twenty four (24) hours of the Programme Portfolio Review Meeting and where necessary the TCM shall subsequently produce formal minutes of the Programme Portfolio Review Meetings which the TCM shall use reasonable endeavours to circulate within three (3) Business Days of the Programme Portfolio Review Meeting.
- 6.2.3 The TCM shall have the right to convene additional meetings to discuss the Programme Portfolio Plan or detailed Projects and/or Programmes, where the Contractor fails to provide sufficient Assurance to TTL in the Project or Programme Report and at the Project or Programme Review Meeting that it will achieve the Project or Programme dates, deliverables and achieve the specified Service Levels. The Contractor shall ensure that suitably qualified Contractor Personnel attend all such meetings convened by the TCM.
- 6.2.4 The Contractor shall inform TTL of any significant delay with a Programme or with a Project that may significantly affect other Projects. The Contractor shall include details about the delay, the cause for this delay, the impact on the Project, Programme and/or related Projects, and options for mitigation.
- 6.2.5 At the earliest possible Programme Portfolio Review Meeting, the Contractor shall discuss with TTL any significant delays described under paragraph 6.2.4 of this Schedule, and shall agree an action plan for any mitigation, rectification and/or escalation.
- 6.2.6 Where this delay has an impact on Projects and/or Programmes delivered by TTL and/or other Third Parties, the TTL Programme Manager will inform the appropriate TTL Project Managers and/or Third Parties about the delay as well as the agreed action plan for mitigation, rectification and/or escalation. If required, the TTL Programme Manager will agree any additional actions with these project managers from TTL and/or Third Parties.

6.3 Integrated Programme Portfolio Review Meeting

- 6.3.1 The Contractor shall meet with TTL, every six (6) months, to review:
- (a) the Programme Portfolio that the Contractor is managing, ensuring TTL that it is on track for delivery to time, cost, quality and resources; and
 - (b) any initiatives that may be proposed and initiated in the next twelve (12) months,
- (the "**Integrated Programme Portfolio Review Meeting**")
- 6.3.2 The Contractor shall consider these proposed initiatives and assess whether it will have the resources and capacity to deliver these if it is awarded the work.
- 6.3.3 If the current level of resources and capacity is insufficient, the Contractor shall inform TTL how it may be able to increase its level of resources and capacity in time for the start of an initiative.
- 6.3.4 If the level of resources and capacity cannot be increased sufficiently, the Contractor shall recommend to TTL how these initiatives could be delivered.

6.3.5 TTL may invite representatives from TTL's organisation as well as any other Third Party, who will be asked to conduct the same review and assessment, as set out in paragraphs 6.2.1 to 6.3.4 of this Schedule.

6.4 The Programme Portfolio Plan

6.4.1 The Contractor shall prepare and submit to TTL no later than three(3) Business Days prior to the first Programme Portfolio Review Meeting, and shall maintain throughout the Term an overview of all current and anticipated Projects and Programmes, and be separated into logical and meaningful sections (the "**Programme Portfolio Plan**").

6.4.2 Where the Contractor fails to submit a Programme Portfolio Plan in accordance with paragraph 6.4.1 more than once in any three (3) consecutive Periods the Contractor shall prepare and submit a Corrective Action Plan in accordance with Schedule 12.4 (Contract Management).

6.4.3 The Contractor shall organise the Programme Portfolio Plan to aid meaningful progress reviews with the TCM at the Programme Portfolio Review Meetings.

6.4.4 The Contractor shall develop the Programme Portfolio Plan using techniques that clearly identify the critical path and shall present the information in bar chart and tabular formats as agreed with TTL.

6.4.5 The Contractor shall ensure that the Programme Portfolio Plan shall as a minimum:

- (a) include all TTL activities necessary to support the Contractor's performance of this Contract;
- (b) include early start and finish dates for each major Programme and Project activity;
- (c) show, where applicable, remaining float;
- (d) highlight critical paths;
- (e) show activity durations to an appropriate scale;
- (f) show key logic links;
- (g) show key interdependencies between Programmes and Projects;
- (h) be capable of being filtered and sorted;
- (i) show the principal organisation responsible for each activity including Category 1 Sub-Contractors;
- (j) show the Contractor's interim Programme and Project events and delivery dates; and
- (k) show milestone dates where applicable.

6.4.6 The Contractor shall use the Programme Portfolio Plan for both forecasting and recording actual progress of Programmes and Projects.

6.4.7 The Contractor shall make the Programme Portfolio Plan available to TTL as reasonably requested by TTL.

- 6.4.8 On the Service Commencement Date the Contractor shall agree with TTL a version of the Programme Portfolio Plan that comprises the "**Baseline Programme Portfolio Plan**" against which all future progress is monitored and reported. Any revisions to the Baseline Programme Portfolio Plan shall be agreed between the Contractor and TTL at the Programme Portfolio Review meetings.
- 6.4.9 The Contractor shall ensure that the Programme Portfolio Plan shall be formally reviewed, updated and reissued every four (4) weeks using a 'time-now' analysis and sharing a common 'time-now' date with all the Project Plans and Programme Plans, to be agreed with TTL. If progress is ahead or delayed compared to the Baseline Programme Portfolio Plan then the Contractor shall ensure that the updated plan clearly identifies when the rescheduled activities are planned to occur.

6.5 Programme Portfolio Report

- 6.5.1 The Contractor shall prepare and submit progress reports on the Programme Portfolio (the "**Programme Portfolio Report**") in accordance with the requirements of this Schedule.
- 6.5.2 The Contractor shall submit the Programme Portfolio Report to the TCM at least three (3) Business Days before each scheduled Programme Portfolio Review Meeting and where the Contractor fails to do so it shall prepare and submit a Corrective Action Plan in accordance with Schedule 12.4 (Contract Management).
- 6.5.3 The Contractor shall include in the Programme Portfolio Report details of the mitigating measures it has and will take to reduce or eliminate any delays to implementation of Projects and/or Programmes.
- 6.5.4 The Programme Portfolio Report format shall be agreed with the TCM prior to the first Programme Portfolio Review Meeting but will initially follow the following structure:
- (a) executive summary;
 - (b) health and safety and environmental;
 - (c) Programme Portfolio of Programmes and Projects;
 - (d) progress (against key activities identified in the Programme Portfolio Plan);
 - (e) risks;
 - (f) resourcing;
 - (g) technical;
 - (h) quality;
 - (i) TTL operational interface;
 - (j) Third Parties and interfaces;
 - (k) major concerns and remedies; and
 - (l) information required.

6.6 Resource Plans

- 6.6.1 The Contractor shall adequately resource all of the Services to meet the requirements of the Contract and its Programme Portfolio.
- 6.6.2 The Contractor shall develop and maintain resource plans for all Projects, and Programmes as a whole and shall make them available to TTL on request.
- 6.6.3 The Contractor shall review and update the resource plans each Period to suit the Project, Programme and/or Programme Portfolio needs as applicable.