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Schedule 2.1 - ESMCP Mobile Services Agreement Services Description

Version 1.0

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CHANGE HISTORY

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1 Definitions

- 1.1 In construing this Schedule 2.1 (Services Description), unless otherwise expressly specified in this Schedule terms defined and used in Schedule 1 (Definitions) will have the same meaning in this Schedule.

2 Introduction

2.1 Services Overview

- 2.1.1 This Schedule sets out the Services to be provided by the Supplier.

- 2.1.2 The Supplier shall provide the following Services, detailed in Paragraphs 3 to 16:

- (a) provision of Coverage within the Primary Area;
- (b) supply, installation and maintenance of MS Supplier Radio Equipment and on any Radio Site where transmission provision is instructed by the Authority to the Supplier, transmission solution(s), to enable Coverage in the Extended Area;
- (c) provision of backhaul transmission services for Building Digital UK's "Shared Rural Network" (SRN) programme in the Extended Area;
- (d) supply, installation and maintenance of the MS Supplier Radio Equipment on any A2G Radio Site that provides Air to Ground Coverage;
- (e) provision of backhaul transmission services for any Air to Ground radio site;
- (f) provision of a Coverage Portal;
- (g) delivery of Mobile Communications Services;
- (h) provision of technical interfaces;
- (i) management of Availability and Capacity across the Supplier Solution;
- (j) provision of standby power solutions in both the Primary Area and Extended Area;
- (k) provide a set of high level requirements for Gateway Devices that provide local radio service to User Devices, sufficient for the Supplier to undertake a solution viability assessment for Gateway Devices;
- (l) undertake a Technical Impact Assessment to determine the technical feasibility of an Emergency Vehicle Coverage Solution;
- (m) provision of Coverage to Coverage Enhancement Locations;
- (n) supply, installation and maintenance of the MS Supplier Radio Equipment in the London Underground; and
- (o) provide social value initiatives.

- 2.1.3 The Supplier shall provide the necessary support Services to meet the requirements on:

- (a) service management;
- (b) billing services;
- (c) management reporting and auditing;

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- (d) Coverage Portal; and
- (e) document management.

2.1.4 The Supplier shall provide the capability to deliver the following Optional Services:

- (a) Optional Services Catalogue;
- (b) provision of Coverage to Coverage Enhancement Locations;
- (c) power resilience solutions; and
- (d) Air to Ground Coverage.

3 Coverage Provision Across Great Britain

3.1 Coverage Provision

3.1.1 The Supplier shall:

- (a) provide Coverage within the "Primary Area" defined in Annex C (Supplier Area Map);
- (b) enable Coverage within the "Extended Area" defined in Annex C (Supplier Area Map) through the installation of MS Supplier Radio Equipment on the Radio Sites, as detailed in Paragraph 4;
- (c) provide Coverage within the "Extended Area" defined in Annex C (Supplier Area Map) once sites have been accepted as part of TTO;
- (d) ensure Coverage meets the Minimum Data Rates, set out in Annex F (Minimum Data Rates);
- (e) prioritise, as agreed in writing by the Authority and the Supplier, the provision of Coverage to match Customer adoption; and
- (f) use the User Device Reference Configuration characteristics, specified in Annex G (User Device Reference Configurations) when planning and testing Coverage.

3.1.2 In respect of the provision of Incidental Coverage, the Supplier shall use the Quarterly Coverage Reports (QCR) or the Coverage Portal to identify to the Authority any potential impact on Incidental Coverage arising from planned changes or optimisation of the MS Network in order that the Authority may take appropriate mitigating action to minimise the impact to User Organisations.

3.1.3 The Supplier shall include in its provision of Coverage any coverage made available to the general public through Network Rail's initiative to provide mobile network services to the general public for 70% of customer journeys.

3.1.4 The Supplier shall make the Authority aware of any other initiatives known to it or which become known during the Term, that will provide Coverage to the general public and that may be able to be integrated into the Supplier Solution.

3.1.5 The Supplier shall take appropriate steps to ensure that the provision of Coverage in buildings or infrastructure constructed or upgraded after the Effective Date is not funded by the Authority unless stated in Annexes E or J or requested via the Optional Services Catalogue.

3.1.6 The Supplier shall include in its provision of Coverage any 4G/5G Standalone (SA) coverage made generally available to Other Customers where the coverage solution is compatible with all features of the Supplier Solution.

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3.1.7 The Supplier shall (without prejudice to its obligation to provide Coverage) throughout the Term resolve Service Incidents relating to Coverage which are, as assessed by the Supplier, identified as Supplier Fixes.

- (a) Where the Supplier Fix is related to Coverage (in accordance with the methodology detailed in Schedule 6.3 (Coverage Benchmarking and Validation Process)) then the Supplier shall replace that Coverage. Where the Supplier Fix is related to service performance (in accordance with the methodology detailed in Schedule 6.3 (Coverage Benchmarking and Validation Process)) then the Supplier shall restore the service performance.
- (b) Where the service performance incident identified is determined to be a non-contracted area (in accordance with the process detailed in Schedule 6.3 (Coverage Benchmarking and Validation Process)), then this will be assessed by the Authority to determine the impact to the area (threat, harm and risk). If the Authority determines an enhancement is required on the back of the assessment, then this will move into the Coverage Enhancements Workstream. Any enhancements delivered will be incorporated into the Coverage baseline.
- (c) In addition to the requirements detailed within Schedule 2.2 (Performance Levels) (Availability of Coverage and Radio Bearer Access Service) of this Agreement, the usability of Coverage will also be measured by voice quality. The range of acceptable voice quality will be determined using Mean Opinion Score (MOS) and will be agreed between the Authority and the MS Supplier via a listening panel [REDACTED]
- (d) The MOS shall apply to devices specified in Annex G.

3.1.8 In order to improve the availability of Coverage, and where instructed by the Authority via the Optional Services Catalogue, the MS Supplier will increase the number of Strategic Locations (those sites where a single site being unavailable is categorised as a severity 1 or 2) [REDACTED]

3.1.9 In relation to Capacity of the MS Network, the MS Supplier shall:

- (a) conduct an initial demonstration of Capacity;
- (b) report on a quarterly basis, the number of Active Connections that can be supported for all ESN supported carriers in both good Coverage and edge of cell conditions;
- (c) make available Near Real-Time Capacity information, as per Annex D; and
- (d) optimise bearer performance to make best use of Available Capacity.

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

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[illegible]

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[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

3.2 ESN GB Roadset

3.2.1 The ESN GB Roadset will be derived from OSOR and will describe Major Roads, Minor Roads and Other Roads. The ESN GB Roadset is specified by:

(a) all Major and Minor Roads defined by OSOR outside the Extended Area which are set out in the CAN500 Roadset;

(b)

(c)

(d)

[REDACTED]

3.2.2 Commencing the November directly following the Effective Date the MS Supplier will baseline the agreed Coverage in the ESN GB Roadset. This re-baselining will be refreshed each November [REDACTED] for the duration of the Term to take into account the updated OSOR data plus the new predicted Coverage available at Handheld Coverage. In the event that the OSOR map set is discontinued a new map set with a minimum resolution of 1:25,000 shall be selected by the Authority and shall replace the OSOR map set when the annual Coverage re-baseline takes place.

3.2.3 The agreed ESN GB Roadset will subsequently be used as the road basis for all calculations of ESN Vehicle Coverage and Handheld Coverage for the purposes of assessing compliance with KPI MSA1 (and service management considerations as stipulated in this Schedule and Schedule 2.2 (Performance Levels)) and in all Coverage reporting and Coverage visualisation via the Coverage Portal.

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3.3 Vehicle Coverage

(The Radio Plan Rules are as set out in this Paragraph 3.3, excluding Paragraph 3.3.3).

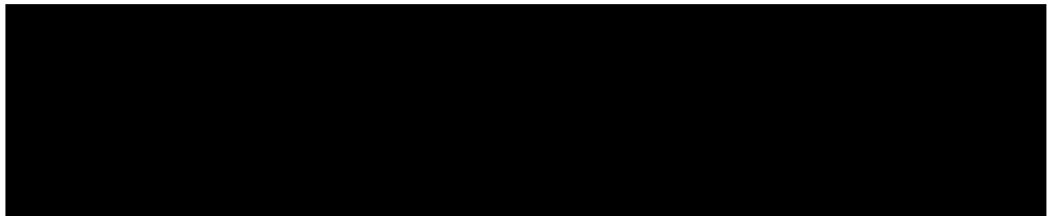
General Vehicle Coverage

- 3.3.1 The Supplier shall use the Vehicle User Device reference characteristics, specified in Annex G (User Device Reference Configurations), when planning Vehicle Coverage and ensure these parameters are factored in to achieve the required Vehicle Coverage.
- 3.3.2 The Supplier shall provide Vehicle Coverage such that Vehicle User Devices can access Mobile Communication Services at the Minimum Data Rates, for all vehicle speeds up to and including 160 miles per hour.
- 3.3.3 The Supplier shall, via the Coverage Portal, provide predictive layers that shows where Vehicle Coverage is Available.

Vehicle Coverage on Major Roads

3.3.4

(a)



(b) Any Major Road sections where access to Mobile Communication Services is less than specified in Paragraph 3.3.4(a) (a) will be acceptable if:

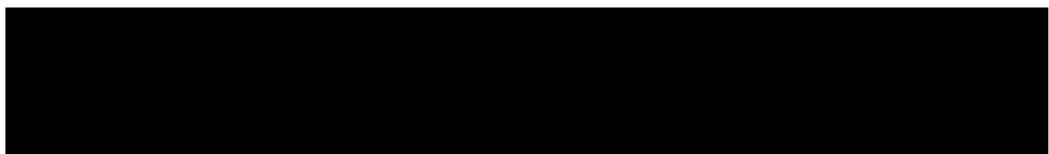
- (i) the sections are limited to a distance of less than [REDACTED] in length;
- (ii) [REDACTED]
- (iii) the total length of such sections is less than [REDACTED] of the total Major Road length within each Exception Pool;
- (iv) the Exception Pool is only applied to the Major Roads as set out in the CAN500 Roadset; and
- (v) where the MS Supplier is unable to meet the above conditions, the MS Supplier must write to the Authority to request dispensation. The MS Supplier shall provide all supporting evidence requested by the Authority and dispensation will be granted at the Authority's sole discretion.

Vehicle Coverage on Minor Roads





3.3.5

(a) The Supplier shall provide Coverage at all locations along all Minor Roads, other than in tunnels, as set out in Paragraph 3.3.5(b), subject to the exceptions listed in Paragraph 3.3.5(c);

(b)



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- (c) Any defined Minor Road sections where access to Mobile Communication Services is less than specified in Paragraph 3.3.5(b) will be acceptable if:
- (i) 
 - (ii) the sections are limited to a distance of less than  in length and the Probability of Access to Service (PAS), at the Minimum Data Rates, to Mobile Communication Services, falls below  at any location on that road section; and
 - (iii) 
 - (iv) the Exception Pool is only applied to the Minor Roads as set out in the CAN500 Roadset;
 - (v) where the MS Supplier is unable to meet the above conditions, the MS Supplier must write to the Authority to request dispensation. The MS Supplier shall provide all supporting evidence requested by the Authority and dispensation will be granted at the Authority's sole discretion.

3.4 Handheld Coverage


3.4.1 The Supplier shall use the Handheld reference characteristics specified in Annex G (User Device Reference Configurations) and ensure these parameters are factored in to achieve the required Handheld Coverage.

3.4.2 

3.4.3 The MS Supplier shall provide Handheld Coverage to the ESN GB Roadset defined in Annex C (Handheld Coverage on Roads Map).

(a) 

(b) 

3.4.4 Handheld Coverage off road will be considered available if it falls within the Handheld Coverage prediction layer (boundary) and is demonstrated as Available by  measurement data provided by the MS Supplier, and reported through the Service Management provisions as stipulated in this Schedule and Schedule 2.2 (Performance Levels).

3.4.5 The Supplier shall provide Handheld Coverage to all MS Supplier Special Coverage Locations detailed in Annex E (MS Supplier Special Coverage Locations).

- (a) On a case by case basis, if the Supplier is able to demonstrate in writing to the satisfaction of the Authority (such submission can include without limitation evidence from an independent valuer with expertise in mobile communications who is a Member or Fellow of the Royal Institute of Chartered Surveyors whose evidence may also be used as part of any subsequent dispute resolution procedure between the Authority and the Supplier) that despite the Supplier using its best endeavours the best price the Supplier is able to achieve to acquire the rights necessary for the installation and operation of the Supplier Equipment at the relevant MS Supplier Special Coverage

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Location is materially in excess of the usual market value for those rights ("Commercial Price") then the Authority shall:

- (i) work together with the Supplier, each party to agree an alternative location within the vicinity of the MS Supplier Special Coverage Location where Supplier Equipment can be installed to provide alternative Handheld Coverage; or

[REDACTED]

[REDACTED]

- (iv) agree the removal of the relevant Special Coverage Location from the Agreement via the Change Control Procedure.

The Parties acknowledge and agree that the purpose of this Paragraph 3.4.5 is to enable the Supplier to gain relief where the Supplier, despite its best endeavours, has been placed in a "ransom" position by the relevant landowner.

3.4.6

[REDACTED]

3.4.7

Without prejudice to requirement stated in Paragraph 3.4.6, the Supplier shall.

[REDACTED] The Supplier shall, promptly, and in any event [REDACTED] of carrying out such measurement provide a written report to the Authority setting out the analysis and the results of such analysis.

3.5 Validation of Coverage (Vehicle and Handheld)

3.5.1

The MS Supplier shall demonstrate the expected presence or absence of usable Coverage on the Coverage Portal using [REDACTED] data. This may include datasets provided by the Authority to take into account User Specific Testing. Using power thresholds (carrier specific) and sample count criteria (as defined in Schedule 6.3 (Coverage Benchmarking and Validation Process) and to be agreed with the Authority), areas will be graded green, red or white on the Coverage Portal, as identified below, to indicate:

- (a) The expected presence of usable Coverage (identified as a green pixel) as described in Paragraph 3.5 of Schedule 6.3 (Coverage Benchmarking and Validation Process);
- (b) The expected presence of unusable Coverage (identified as a red pixel) as described in Paragraph 3.5 of Schedule 6.3 (Coverage Benchmarking and Validation Process); and
- (c) The absence of sufficient information to determine whether the Coverage is usable or not (identified as a white pixel) as described in Paragraph 3.5 of Schedule 6.3 (Coverage Benchmarking and Validation Process).

3.5.2

The MS Supplier shall rebaseline the [REDACTED] data in accordance with Paragraph 4 of Schedule 6.3 (Coverage Benchmarking and Validation Process).

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- 3.5.3 It is expected that the areas will change in colour over time for various reasons. If a contiguous area of green coverage turns red and that area is greater than [REDACTED] or a contiguous [REDACTED] length of road, then the MS Supplier will provide a supplementary report on an annual basis providing the rationale for such change providing it has been red for two or more quarters.
- 3.5.4 The MS Supplier shall provide ongoing assurance by undertaking the following services:
- (a) Benchmarking of Coverage: to provide assurance that the performance of the network is remaining consistent over time (as specified in in Schedule 6.3 (Coverage Benchmarking and Validation Process)). The MS Supplier shall ensure that benchmarking is consistent with the drive test methodology for ESN;
 - (b) Vertical Verification: to provide assurance that the performance of MCX using the PSCS application is remaining consistent over time; and
 - (c) Optimisation: to make use of available features once the US Supplier has delivered the PSCS application (including associated services) to continuously improve the performance of the network and ESN User experience of MCX using the PSCS application.
- 3.5.5 The MS Supplier shall provide and direct a drive testing activity, which shall be used to provide Secure Real-time Transport Protocol (SRTP) link budget analysis. Once the US Supplier has delivered the PSCS application, the MS Supplier shall undertake [REDACTED] of drive testing across representative geotypes to develop MCX link budgets and new service thresholds at which point coverage redesign implications can be understood by the MS Supplier and the Authority.
- 3.5.6 The MS Supplier shall conduct drive testing through the duration of the Term. This ongoing drive testing service will provide ongoing voice quality testing, annual delta reporting, Vertical Verification, optimisation, benchmarking and [REDACTED] calibration services.
- 3.5.7 The MS Supplier and the Authority recognise that the categorisation of Coverage on the Coverage Portal of green, red or white pixelated coverage areas is not a guarantee that service will be acceptable in that area. If a Service Incident is raised with the US Supplier within a green pixelated area, then:
- (a) notwithstanding that this incident is raised with the US Supplier, the MS Supplier will work proactively and collaboratively to resolve the incident in conjunction with the US Supplier and Other ESN Suppliers as necessary, where practically feasible;
 - (b) if it is shown to be an issue which relates to the Services, the MS Supplier shall identify potential solutions to any issues found and then either fix the issue or review with the Authority, US Supplier and ESN Users to determine the next steps, as appropriate;
 - (c) [REDACTED]
 - (d) [REDACTED]
 - (e) if a Service Incident is raised from a red or white area, then there is to be no reasonable expectation of service, however, should Services be required then these will be reviewed by the Authority and User Organisations to determine next steps and the Authority shall ensure that the US Supplier is informed.

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3.6 Marine Coverage

- 3.6.1 Marine Coverage shall be described, using predictions and [REDACTED] data where available.
- 3.6.2 The Supplier will notify the Authority and User Organisations of changes to Marine Coverage that result from changes to the MS Network, such as new site / carrier additions, site NTQs, optimisation, and equipment refreshes. These shall be reflected in the in-life tooling and Coverage Portal.
- 3.6.3 The MS Supplier shall undertake [REDACTED] of marine data collection, split across prediction tool tuning and Marine Coverage link budget re-design. The MS Supplier shall deliver Marine Coverage link budget re-design following the contract award of the User Services contract.
- 3.6.4 When providing the Marine Coverage predictions, as specified in Paragraph 9.4.16, for that part of the Coverage that lies within Territorial Waters, the Supplier shall use the Marine User Device configuration characteristics specified in Annex G (User Device Reference Configurations).

3.6.5

3.7 Coverage Visualisation

- 3.7.1 The MS Supplier shall provide a Coverage Portal that presents the relevant information to the Authority and User Organisations as set out in Paragraph 3.7.3.
- 3.7.2 The MS Supplier shall provide access to the Coverage Portal which will be provided through the US Supplier's Self-Service Portal (SSP). Ahead of the SSP becoming available and in the event of downtime to the SSP, the MS Supplier should provide controlled access to the Coverage Portal to ESN Users nominated by the Authority.
- 3.7.3 The MS Supplier shall ensure that the Coverage Portal provides visibility of relevant Coverage and service information including, but not limited to:
- (a) visual layers as stated in above sections; Vehicle Coverage, Handheld Coverage, Marine Coverage and Aircraft Coverage;
 - (b) available Coverage: predicted and measured using various service impacting thresholds as agreed by the Authority;
 - (c) Available Capacity: high, medium, low assessment of Capacity with regards to number of ESN Users supported in a given area;
 - (d) service information: incident and change information to allow Near Real Time and forward planning;
 - (e) resilience information: to show resilience (power, transmission, overlapping coverage);
 - (f) ESN User data, subject to ESN User approval; and
 - (g) Authority approved testing related to service outcomes, including that of ESN Users.
- 3.7.4 The MS Supplier shall have the capability to display Coverage Enhancement Locations, once provided by the Authority, via the Coverage Portal.
- 3.7.5 The MS Supplier shall provide the Authority with a visual representation of the Coverage and Capacity of service-affecting serving cells to operational locations, as provided by the Authority, and report against planned change and NTQs.
- 3.7.6 The MS Supplier shall provide a Coverage Portal that will support a minimum of [REDACTED] System User licences with [REDACTED] concurrent System Users and has the capability to be scaled if required.

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- 3.7.7 The MS Supplier shall provide a Coverage Portal with [REDACTED] and the MS Supplier shall notify the Authority of any maintenance or planned downtime with a [REDACTED] notice.

3.8 ESN Air Coverage

- 3.8.1 The Supplier shall:

- (a) in conjunction with the Authority jointly assure the ESN Air Radio Plan;
- (b) validate the seamless handover between the G2A and A2G networks through testing in the live environment and use these results to inform the ESN Air Radio Plan; and
- (c) following assurance, provide ESN Air Coverage from ground level up to 10,000 feet AMSL associated with the Coverage provided by the Supplier's Base Stations over the geographical landmass of Great Britain as augmented by A2G Coverage.

- 3.8.2 The Supplier shall:

- (a) use the Aircraft User Device configuration characteristics specified in the Annex G - User Device Reference Configurations when planning ESN Air Coverage and ensure these parameters are factored in to achieve the required Coverage;
- (b) [REDACTED]
- (c) identify predicted gaps in ESN Air Coverage, or those that may arise from problem management, to determine the appropriate remedial outcome and submit this to the Authority for triage and agreement. Where a new ESN Air Infill site is required, these will be instructed via the Optional Services Catalogue.

- 3.8.3 The Supplier shall be responsible for the provision of additional ESN Air Infill that may be required to maintain the ESN Air Coverage:

- (a) prior to A2G Network Transfer to Operations following joint Authority and Supplier validation activities of the Authority A2G Radio Plan; or
- (b) during the Term associated with the Supplier's identification of the need for additional A2G Radio Sites and/or re-planned or new Base Stations associated with the Supplier's Mobile Network to meet ESN Air Coverage requirements.

- 3.8.4 The Supplier's Optional Services shall permit the Authority to procure additional hardware, software and services from the Supplier (including ancillary radio frequency equipment, undertake the acquisition, design and build of new ESN Air Infill as may be required).

- 3.8.5 Title to any new A2G Sites shall transfer to the Authority in accordance with Schedule 8.5 (Exit Management).

3.9 UK Roaming

- 3.9.1 The Supplier shall support roaming of ESN Users to other UK licensed mobile network operators to provide a best efforts service where such agreements have been made between the operators or mandated by regulatory requirements. User Subscription access to this functionality shall be based on the User Subscription Profile.

- 3.9.2 The Supplier shall ensure that where national roaming is available, the User Device shall only roam where no access to the Mobile Communication Service is provided by the Supplier Solution.

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3.10 Not Used**3.11 WiFi Access**

- 3.11.1 The Supplier shall allow User Devices access to the Mobile Communication Services via any secure (in accordance with the requirements of Schedule 2.4 Security Management) WiFi access point that is also available to their Other Customers. The level of service provided shall be at least equivalent to that provided for Other Customers.

3.12 Mobile Base Station

- 3.12.1 The Supplier shall ensure that [REDACTED] Mobile Base Stations ("Pool") are available for deployment by the Supplier at the request of the Authority to support up to [REDACTED] concurrent requests across Great Britain for their deployment, with each Mobile Base Station being:

- (a) autonomously powered;
- (b) secure against intrusion and theft;
- (c) capable of fulfilling the functionality of a normal Base Station forming part of the Supplier Solution; and
- (d) capable of reliable connection to the Supplier Solution from any location, including locations with no Coverage.

- 3.12.2 The Supplier must always be capable of supporting at least [REDACTED] deployment of Mobile Base Station pursuant to Paragraph 3.12.1 by the Authority at any one time irrespective of any other difficulties the Supplier is facing in relation to deficiencies against Coverage requirements set out in Paragraphs 3.1, 3.2, 3.3 and 3.5 of this Schedule and Annex 1 of Schedule 2.2 (Performance Levels).

- 3.12.3 The Supplier shall:

- (a) use its best endeavours to ensure that the first Mobile Base Station deployed from the Pool from time to time in response to a request pursuant to Paragraph 3.12.1 is deployed and functioning at the requested location in less than [REDACTED]; and
- (b) use reasonable endeavours to ensure that any subsequent deployment of a Mobile Base Station from the Pool (following a request to which (a) above applies) are deployed and functioning at the requested location as soon as is practicable.

3.13 Gateway Solution

- 3.13.1 The Supplier shall provide a Gateway Solution that enable Gateway Devices to be connected to the Mobile Network in order to extend Coverage into locations that would otherwise not have Coverage to allow connectivity to the Mobile Communications Services.

- 3.13.2 The Supplier shall ensure that the Gateway Solution is scalable to support a large number of Gateway Devices, up to one Gateway Device in every User Organisation Vehicle.

- 3.13.3 The Supplier shall provide a Gateway Solution that provides the following functionality:

- (a) manages the configuration of Gateway Devices when they are connected to the MS Network in order to maximise Coverage, minimise interference, manage handovers between the Gateway Device/other Gateway Devices within the same vicinity;
- (b) presents ESN User traffic to the US Supplier Solution in a transparent way such that the US Supplier Solution is unaffected by the use of Gateway Device operation; and

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[REDACTED]

3.13.4 The Supplier shall ensure that the Gateway Solution permits the Gateway Device to function automatically without ESN User intervention for its principal operating modes including:

- (a) initiation of Gateway Device operation;
- (b) exit from Gateway Device operation;
- (c) networking with local compatible Gateway Devices, such that they can be linked together to extend the Coverage; and
- (d) enable access to the Mobile Communication Services for User Devices that are within the coverage footprint of a Gateway Device, without requiring ESN User intervention.

3.13.5 The Supplier's Gateway Solution, whilst needing to meet the requirements as set out in this Paragraph 3.13 , needs to be provided alongside the Gateway Device as described in Paragraph 12.6.1.

[REDACTED]

[REDACTED]

3.13.8 The Supplier's implementation of the Gateway Solution shall, as a continuing process that can accommodate the arrival and departure of active Gateway Devices, maintain their functionality when multiple Gateway Devices congregate in close proximity, such that the Coverage being provided overlaps.

3.13.9 The Supplier shall ensure that double billing does not occur with the Supplier Solution to the extent that either traffic over the backhaul bearer used to connect the Gateway Device to the MS Network or the individual ESN User traffic is billed, but not both.

3.13.10 The Supplier shall undertake type approval testing of all Gateway Devices as required by the Authority and report to the Authority whether such devices conform to the Gateway Device specification notified to the Authority by the Supplier.

3.13.11 The Supplier shall, as part of Exit Management further detailed in Schedule 8.5 (Exit Management), provide such information as may reasonably be required by the Authority to enable any Replacement Supplier to obtain and configure a replacement for the Gateway Solution that will interoperate with the Gateway Devices supplied by the Supplier.

3.13.12 The Supplier shall provide the Authority with a record of Gateway Solution equipment which is to be used solely for the provision of the Services as set out in this Paragraph 3.13 (Gateway Solution), which shall be included at Annex 2 and 3 of Schedule 8.5 (Exit Management) which lists shall be maintained throughout the Term by the Supplier.

3.13.13 The Supplier shall transfer ownership of all such Gateway Solution equipment as elected by the Authority for transfer in consideration for [REDACTED] together with any agreements for the ongoing repair, support, maintenance and other associated services in connection with such Gateway Solution, to the Authority or any Replacement Supplier, immediately following the end of the Termination Assistance Period (or as otherwise agreed during the Termination Assistance Period).

3.14 Network Support for High Power User Devices

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- 3.14.1 The Supplier will on written request from the Authority investigate how the Supplier could support a use of class 1 (31 dBm) User Devices can be installed in vehicles or fixed locations and which will have been subject to Ofcom regulatory approval.

3.15 Specific ESN Coverage

- 3.15.1 The Supplier shall on or before the Effective Date provide the Authority with a record of Sites or proposed Sites which are to be provided solely for the delivery of the Services (ESN Specific Site) (accepting that the Supplier may subsequently use ESN Specific Sites to provide services to Other Customers), which shall be included at Annex 6 of Schedule 8.5 (Exit Management) (ESN Specific Site List) (which list shall be maintained throughout the Term by the Supplier, under Change Control). For each ESN Specific Site, the Supplier shall provide the following information as a minimum:

- (a) the location;
- (b) whether the ESN Specific Site is (or is proposed to be):
 - (i) established on land owned by the Supplier or leased from a third party;
 - (ii) newly built by or on behalf of the Supplier; or
 - (iii) established through the lease of assets or space on an existing telecommunications infrastructure site;
- (c) a record of all active and passive MS ESN Supplier Radio Equipment which will be used at the ESN Specific Site; and
- (d) any other information material to the design or operation of the ESN Specific Site.

- 3.15.2 The Supplier shall for each leased ESN Specific Site acquire a lease(s) or other right(s) to use (for the purposes of this Paragraph 3.15.2 'Lease') the site and/or relevant infrastructure which includes the following terms:

[REDACTED]

- 3.15.3 The Supplier shall transfer any Leases to the Authority or any Replacement Supplier during the Termination Assistance Period, in accordance with Annex 6 of Schedule 8.5 (Exit Management).

- 3.15.4

[REDACTED]

- 3.15.5 Upon expiry of the Term, the Supplier shall transfer the MS ESN Supplier Radio Equipment as listed in Schedule 8.5 (Exit Management) and elected by the Authority for transfer, to the Authority in consideration [REDACTED]. On the earlier termination of this Agreement by either Party then the relevant MS ESN Supplier Radio Equipment elected by the Authority for transfer shall be transferred by the Supplier to the Authority immediately following the end of the Termination Assistance Period (or as

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otherwise agreed during the Termination Assistance Period) in consideration for the payment by the Authority of the applicable MS ESN Supplier Radio Equipment depreciated value as provided for in Schedule 8.5 (Exit Management).

3.15.6



3.15.7



3.15.8



4 Coverage in Extended Area

4.1 MS Supplier EAS Radio Equipment Specification

- 4.1.1 The Supplier shall issue an MS Supplier EAS Radio Equipment Specification. The Supplier shall detail in the MS Supplier EAS Radio Equipment Specification the performance of each component listed, shall warrant the components and the performance of the component's conformity to the descriptions in the MS Supplier EAS Radio Equipment Specification and any manufacturers documentation, and shall fix or replace any components that do not achieve the performance detailed.
- 4.1.2 The Supplier shall define and detail ICDs for the interfaces that they require at Extended Area Base Station locations for the Authority to implement.
- 4.1.3 The Supplier shall state, in the MS Supplier EAS Radio Equipment Specification the following:
- (a) the requirements for the accommodation and installation facilities (including space, power, air conditioning, environmental parameters) for the equipment in the MS Supplier EAS Radio Equipment Specification, which shall reflect practice on its own Base Stations;
 - (b) any guidance necessary to enable the Authority to carry out its radio planning for the Extended Area; and
 - (c) any guidance necessary to enable the Authority to make a cost-effective selection of the MS Supplier Radio Equipment for each Radio Site.
- 4.1.4 The Supplier shall maintain and submit an updated version of the MS Supplier EAS Radio Equipment Specification every twelve months or when the Supplier wants to update the MS Supplier EAS Radio Equipment Specification.
- 4.1.5 The Supplier shall notify the Authority of equipment within the MS Supplier EAS Radio Equipment Specification that will reach end of service and provide a replacement option to ensure the MS Supplier EAS Radio Equipment Specification is maintained.

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4.2 Radio Equipment Installation in Extended Area

- 4.2.1 The Supplier shall, in line with Schedule 6.1 (Implementation Plan) submit and agree with the Authority, a MS Supplier EAS Radio Equipment Specification catalogue of MS Supplier Radio Equipment and spectrum of equivalent or superior quality to equipment and spectrum used on their own Base Sites, (the "MS Supplier EAS Radio Equipment Specification to the Authority") for the Authority to use as the basis for its radio planning and Radio Site selection. This shall enable the Authority to be aware of any constraints on the deployment of the equipment.
- 4.2.2 The Supplier shall ensure the MS Supplier's EAS Radio Equipment Specification includes details of the following components:
- (a) available spectrum, including all available frequencies that the Supplier holds licences for;
 - (b) antennas;
 - (c) mast head amplifiers;
 - (d) feeders;
 - (e) couplers;
 - (f) filters;
 - (g) combiners;
 - (h) all radio Base Station elements up to and including the radio equipment rack and the interface to the transmission equipment; and
 - (i) any radio planning guidelines including radio and deployment parameters specified in the Supplier's licence.
- 4.2.3 Upon instruction and the provision of a Handover Pack from the Authority the Supplier shall provide, install, and maintain the MS Supplier Radio Equipment, and on any Radio Site where transmission provision is instructed by the Authority to the Supplier, transmission solution(s) from the Radio Site into the Dedicated Core Network and provide spectrum in order to provide Coverage in the Extended Area.
- 4.2.4 The Supplier shall ensure that all Bearers and Mobile Communication Services available in the Primary Area operate across and in the Extended Area.
- 4.2.5 The Supplier shall agree with the Authority any changes they make that impact the Coverage provided, for all locations adjacent to the Extended Area.
- 4.2.6 The Supplier shall work with the Authority to:
- (a) ensure that User Device handovers and mobility between Base Stations in the Primary Area and Base Stations in the Extended Area are indistinguishable from those between two Base Stations in the Extended Area; and
 - (b) resolve radio planning issues between the Extended Area and the Primary Area.
- 4.2.7 The Supplier shall provide to the Authority details of the link budgets used for Coverage planning on the date described in Schedule 6.1 (Implementation Plan) and shall do so continuously afterwards to reflect any changes in the link budgets over time.
- 4.2.8 The Supplier shall perform adjustments to the configuration of the MS Supplier Radio Equipment in the Extended Area, including positioning, at the request of the Authority, in order to ensure that optimum Coverage is achieved in the Extended Area.

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- 4.2.9 The Authority shall instruct the Supplier, using the Optional Services Catalogue, to provide, install, commission and maintain all the MS Supplier Radio Equipment for each of the EAS Sites. The instructions shall include, but not be limited to the following:
- (a) the legal agreement by which the site is made available for use;
 - (b) the MS Supplier Radio Equipment selected from the MS Supplier EAS Radio Equipment Specification to be installed at each Radio Site;
 - (c) the frequencies, power, and antenna height, bearing of azimuth and tilt;
 - (d) shelter design and layout;
 - (e) tower design and current occupancy;
 - (f) feeder window design;
 - (g) in-building cable support;
 - (h) building to tower cable support;
 - (i) earthing arrangements (outdoors and indoors);
 - (j) power connection interface;
 - (k) environmental control specification;
 - (l) access procedures;
 - (m) Transmission Interconnect cabinet for SRN; and
 - (n) security requirements.
- 4.2.10 The Supplier shall ensure that the system used for the provision of the Radio Bearers Interface within the Extended Area complies with the same global Open Standards as that are proposed for Radio Bearers Interface in the Primary Area.
- 4.2.11 In respect of the Transferred CAN CR0586 sites only, the Supplier shall provide additional Optional Services on a site-by-site basis from the Transferred CAN CR0586 site start date to the Transferred CAN CR0586 site end date for each Transferred CAN CR0586 site:
- (a) supply DC power equipment with associated installation and commissioning services;
 - (b) supply backhaul transmission equipment and services such that the Supplier connects the Mobile Network directly to the MS Supplier Radio Equipment on an EAS Site without an intermediate POI;
 - (c) supply facilities management services;
 - (d) supply service management services in relation to DC power; and
 - (e) backhaul transmission where these are provided by the MS Supplier.
- 4.2.12 The Supplier shall make available transmission backhaul connectivity solutions for the Authority to purchase in order to provide transmission connectivity for the Radio Sites.
- 4.2.13 The Supplier shall follow the process flow chart set out in Annex I – EAS Transmission Solution Process Flow Chart when deciding on the appropriate transmission solution to be implemented at a particular Radio Site:

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- (a) backhaul transmission solutions shall be suitable for simultaneous use by both ESN and Building Digital UK's Shared Rural Network (SRN) programme unless otherwise agreed by the Authority on a case-by-case basis;
 - (b) the actual transmission solution and corresponding Charges for the solution to be delivered for each of the Radio Sites will be documented between the Parties on a site-by-site basis.
 - (c) [REDACTED]
 - (d) the specific technical requirements in relation to SRN are set out in Paragraph 4.4; and
 - (e) the Supplier will provide a team [REDACTED] to manage the end-to-end delivery of the transmission solutions from design to delivery for the Radio Sites.
- 4.2.14 In respect of the Transferred CAN CR0711 sites only, the Supplier shall provide additional Optional Services on a site-by-site basis from the Transferred CAN CR0711 site start date to the Transferred CAN CR0711 site end date for each Transferred CAN CR0711 site:
- (a) Supply MS Supplier Radio Equipment on a Radio Site without an intermediate POI;
 - (b) supply facilities management services;
 - (c) supply service management services in relation to DC power; and
 - (d) backhaul transmission where these are provided by the MS Supplier.

4.3 Air to Ground Coverage

4.3.1 The Supplier shall:

- (a) provide an A2G Network (associated with [REDACTED] A2G Radio Sites) in accordance with the Supplier- and Authority-approved ESN Air Network Design and A2G Radio Plan that collectively provides Air-to-Ground Coverage;
- (b) following the Supplier's assurance of the Authority A2G Radio Plan, be responsible for maintaining the A2G Coverage in accordance with the A2G Radio Plan and meeting the performance criteria defined in Annex F (Minimum Data Rates); and
- (c) continue to ensure that the A2G Network provides a highly-available and reliable solution with consideration given to adopting redundant components, sub-systems and systems and associated Disaster Recovery Services.

4.3.2 The Supplier's A2G Radio Plan responsibilities:

- (a) the Authority and the Supplier shall agree the criteria, process, and approvals for transferring responsibility of the Authority A2G Radio Plan to the Supplier prior to A2G Network Transfer to Operation. The Authority shall provide the Supplier with full details of the Authority A2G Radio Plan to support the joint engagement; and
- (b) following the Authority's transfer of responsibilities, the Supplier shall:
 - (i) maintain the A2G Radio Plan;
 - (ii) create an ESN Air Radio Plan, incorporating the A2G Radio Plan; and

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- (iii) undertake network optimisation, support network evolution and make recommendations for changes (including proposals for ESN Air Infill) to ensure that ESN Air Coverage from ground level up to [REDACTED] AMSL is optimal, addressing any Ministry of Defence locations and/or geographic exclusion zone aspects and updating the ESN Air Radio Plan and A2G Radio Plan as required.

4.3.3 Where the Supplier proposes changes to the ESN Air Radio Plan (for example associated with addressing coverage issues or maintaining or optimising ESN Air Coverage or introducing additional ESN Air Critical Operational Locations) the Supplier shall present their recommendations for change to the Authority for Approval prior to any changes being implemented.

4.3.4 The Authority shall remain accountable for all matters related to the spectrum management and licence obligations associated with the A2G Radio Plan.

4.3.5 Not used.

A2G Network Incident and service management-related services

[REDACTED] [REDACTED]

- (a) provide A2G Interim Incident and Service Management for A2G Radio Sites [REDACTED]
- (b) provide A2G Enduring Incident and Service Management of the A2G Network [REDACTED]
 - (i) [REDACTED] or
 - (ii) [REDACTED]
- (c) provide A2G Network Performance Monitoring Reports per Service Period including, as applicable:
 - (i) existing Key Performance Indicators and Subsidiary Performance Indicators where these are relevant to the delivery of ESN via the A2G Network [REDACTED]
 - (ii) supplemented by A2G Network-specific Key Performance Indicators [REDACTED]
 - (iii) supplemented, as applicable, by A2G Network-specific Subsidiary Performance Indicators.

4.3.7 The Supplier shall:

- (a) [REDACTED]
- (b) undertake performance investigations and problem management activities and provide a Continuous Improvement Plan where there are repeated failures in three

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(3) or more Service Periods, or an emerging trend, to meet one or more agreed service levels associated with each Key Performance Indicator or Subsidiary Performance Indicator set out in the A2G Network Performance Monitoring Report.

- 4.3.8 The Supplier shall provide ESN Air Technical Expertise, and associated systems and processes, to support the Authority and the ACS Supplier to individually, or jointly, undertake performance investigations and problem management related to ESN Air Coverage and Aircraft User Device or associated applications. This will include the ability of the Supplier to:
- (a) share securely with the ACS Supplier extracts of relevant event data derived from the A2G Network; and
 - (b) receive securely from the ACS Supplier extracts of relevant event data derived from Aircraft User Devices respectively.
- 4.3.9 The Supplier shall appoint a named service manager to attend, participate and lead national service review meetings (on a planned monthly, quarterly and annual basis, and where a significant event occurs on an ad-hoc basis) with the Authority and User Organisations and their representatives. In accordance with the meetings' terms of reference, to be agreed between the Supplier and the Authority, the Supplier shall:
- (a) provide details of their performance of the A2G Interim Incident and Service Management or A2G Enduring Incident and Service Management in the preceding Service Period(s);
 - (b) provide details of any performance investigations and / or problem management activities undertaken (including those with the Authority and / or ACS Supplier) and presenting, if applicable, a Continuous Improvement Plan; and
 - (c) set out recommendations for change, including recommendations to address site resilience, or the need for additional Coverage or Capacity, and/or ESN Air Infill.
- 4.3.10 The Supplier shall attend on a quarterly basis service review meetings with the Authority, the ACS Supplier and Other ESN Suppliers involved in the provision of aspects of ESN Air and other applicable stakeholders. In accordance with the meeting's terms of reference, to be agreed between the Supplier and the Authority, the objective will be to discuss wider cross-supplier and stakeholder service-related matters.
- 4.3.11 The Supplier shall be responsible for the design, build and maintenance of an ESN Air Reference Environment and making this available to Authority-authorised suppliers for these suppliers' prototype testing and validation activities.
- 4.3.12 The Supplier shall:
- (a) provide and maintain a record of the A2G Assets that are used solely for the provision of A2G Coverage and which shall be transferred to the Authority in accordance with the requirements of Schedule 8.5 (Exit Management); and
 - (b) provide A2G Spare Part Management associated with the provision of the A2G Interim Incident and Service Management and A2G Enduring Incident and Service Management.
- 4.3.13 The Supplier shall provide and maintain:
- (a) an ESN Air Radio Planning Tool to support the ESN Air Radio Plan and ESN Air Coverage planning activities. The Supplier shall provide the planning parameters to the Authority on request;

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- (b) A2G Coverage Visualisation accessible via the Coverage Portal offering a simple view of the geographical area(s) affected by an A2G Radio Site and/or A2G Network incident;
 - (c) an ESN Air Virtual Flight Path Tool for problem management activities;
 - (d) A2G Network event and capacity event logs in applicable format suitable for use by the Authority and ESN Users in their own geographical information systems; and
 - (e) ESN Air Critical Operational Locations.
- 4.3.14 The Authority may from time-to-time notify the Supplier of ESN Air Critical Operational Locations to which specific requirements shall apply and which may require an ESN Air Infill.
- 4.3.15 Upon expiry of the Term, the Supplier shall transfer A2G Assets associated with the A2G Network in accordance with Schedule 8.5 (Exit Management).

4.4 SRN Backhaul Transmission Services Summary of Technical Characteristics

- 4.4.1 The Supplier shall provide shared IP backhaul connectivity for the four UK Mobile Network Operators and the Emergency Services Network between their respective equipment located at an EAS site and their individual core networks.
- 4.4.2 The Supplier shall provide an individual physical demarcation port for each MNO at an EAS site.
- 4.4.3 The Supplier shall provide frequency synchronisation on the individual MNO ports at the EAS sites by the use of Synchronous Ethernet (SyncE).
- 4.4.4 The Supplier shall provide end to end segregation of traffic between MNOs using Layer 3 VPN techniques (or similarly appropriate solution).
- 4.4.5 The Supplier shall route traffic to and from the MNO core networks to agreed IP peering points.
- 4.4.6 
- 4.4.7 
- 4.4.8 The Supplier shall implement an appropriate traffic prioritisation approach to assure traffic prioritisation over any constrained or heavily loaded links.
- 4.4.9 The Supplier shall carry out planning, implementation, installation and configuration of hardware and software to achieve the end-to-end connectivity for SRN at the EAS site and any intermediate locations en route.
- 4.4.10 The Supplier shall coordinate with the Authority delivery team during transmission delivery, including periodic reporting.
- 4.4.11 The Supplier shall gather the per-MNO site-specific MNO data for each site during the planning phase for that site.
- 4.4.12 The Supplier shall acquire any 3rd party wayleaves, dish rights or other permissions required for the implementation and operation of any backhaul equipment to be used to deliver the transmission services.

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- 4.4.13 The Supplier shall conduct initial proving of backhaul solutions for SRN services at location(s) to be agreed with the SRN MNOs and the Authority during mobilisation, at the SRN MNO's own expense.
- 4.4.14 The Supplier shall provide 24 x 7 x 365 monitoring of the backhaul service, with a fault reporting and resolution capability on the same basis to be available to the SRN MNO operations providers.
- 4.4.15 The Supplier shall provide notifications to impacted MNOs of Planned Events or Spontaneous Events affecting the connectivity service and progress updates during the resolution of any unplanned outage.
- 4.4.16 The Supplier shall provide routine reporting on in-life service delivery.

4.5 Estate and Facilities Management Services in Extended Area

- 4.5.1 The Supplier shall provide the following services:
 - (a) lease management;
 - (b) rent and rates management;
 - (c) estate support;
 - (d) access help desk and support;
 - (e) utilities, mechanical, electrical, management and maintenance;
 - (f) site maintenance;
 - (g) communications related fabric management and maintenance;
 - (h) site security and maintenance;
 - (i) structures management;
 - (j) health and safety management;
 - (k) safety, health, environment and quality management; and
 - (l) programme and project management.

5 Mobile Communication Service

5.1 Direct Device-to-Device Communication

- 5.1.1 The Supplier shall provide inputs into the ESN Technology Roadmap, to be agreed with the Authority in advance, showing how and when appropriate Direct Device to Device Communications will be introduced in accordance with Paragraphs 5.1.2 - 5.1.7.
- 5.1.2 The Supplier shall provide a service to enable Direct Device to Device Communications without the use of any network infrastructure and if appropriate under network control. This shall include:
 - (a) radio spectrum compatible with 3GPP ProSe standards and User Devices; and
 - (b) any appropriate network control, compatible with 3GPP ProSe standards.
- 5.1.3 The Supplier shall ensure the solution provided shall enable Direct Device to Device Communications over [REDACTED] assuming free-space path loss for Device to Device Communications between a Handheld User Device and a Vehicle User Device; and over a

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[REDACTED] assuming free-space path loss for Direct Device-to-Device Communications between Handheld User Devices only.

5.1.4

[REDACTED]

5.1.5 The Supplier shall ensure the solution provided shall enable [REDACTED] simultaneous, independent Direct Device-to-Device Communications in close proximity (such that the User Devices would be within communications range of each other) without any degradation of the quality of communications or performance.

5.1.6 The Supplier shall implement all updates to the User Device Type Approval Specification necessary for the support of Direct Device-to-Device Communications.

5.1.7 The Supplier shall use reasonable endeavours to ensure that the Supplier Solution supports the use of Direct Device to Device Communications as soon as possible following the availability of network and User Device technology which is compatible with 3GPP ProSe standards and which uses appropriate radio spectrum made available by the Supplier pursuant to Paragraph 5.1.2(a).

5.2 Access to the Mobile Communication Service

5.2.1 The Supplier shall provide a Mobile Network Radio Interface that enables access to the Mobile Communications Services for all User Subscriptions and User Devices that have been correctly provisioned on the Mobile Subscriber Server.

5.2.2 The Supplier shall enable each User Device to communicate with all other User Devices via all of the Mobile Communications Services, irrespective of User Organisation or geographic location, subject to User Subscription permissions and Coverage.

5.2.3 The Supplier shall provide and support 4G access to the Mobile Communications Services from the Effective Date and 5G SA access to the Mobile Communication Service on or before the date specified in Schedule 6.1 (Implementation Plan).

5.2.4 The Supplier shall remove support for 2G and 3G access to the Mobile Communication Service for ESN Users

5.2.5

[REDACTED]

5.2.6 The Supplier shall support the capability to provide direct Internet connectivity, at the same level of service provided to Other Customers or better.

5.2.7 The Supplier Solution shall support an Equipment Identity Register function that prevents User Devices connecting to the MS Supplier Solution that have been reported lost or stolen via a service incident received from the US Supplier via the ESN Service Management System interface.

5.3 Bearers

5.3.1 The Supplier shall make available Bearers supporting packet delay budgets and error loss rates at least equivalent to those defined in 3GPP TS23.203 (Table 6.1.7, Release 16), to deliver a set of Bearer Types as defined in Annex H (Bearer and Connection Types).

5.3.2 The Supplier should use standardised 3GPP QCI and ARP parameters where possible, but may utilise operator defined QCI and ARP values with agreement of the Authority and US Supplier where standardised values do not provide sufficient granularity or meet expected performance.

5.3.3 The Supplier may make available Bearers (and associated QCI and ARP Profiles) that are available to Other Customers, to ESN Users to deliver Non-Critical Bearer Types described in Annex H.

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- 5.3.4 The Supplier shall provide Bearers that are capable of transporting all Traffic:
- (a) between a User Device and the Mobile Network Gateway; and
 - (b) for all Supplier provided services including Telephony and SMS.
- 5.3.5 The Supplier shall ensure that Bearers requiring use of tunnelling protocols for the transport of Traffic through the Supplier Solution shall be terminated at the Mobile Network Gateway for all Traffic bound for the US Supplier Solution.
- 5.3.6 The Supplier Solution shall ensure that ESN Users can concurrently run [REDACTED] Bearers to the Mobile Network Gateway to allow use of different services with different bearer type and User Priority.
- 5.3.7 The Supplier shall ensure that the Bearers are able to [REDACTED]
- 5.3.8 The Supplier shall ensure that the Bearers support data communications for IP based protocols across the US-MS Interface.
- 5.3.9 The Supplier shall deliver all Traffic over the provided Bearers unaltered between the User Device and the Mobile Network Gateway, including all forms of manipulation of Traffic, unless approved by the Authority, including but not limited to compression, trans-rating / transcoding, filtering, blocking and ad-insertion.
- 5.3.10 The Supplier shall ensure continuity of service for all communications, including when a User Device moves or transfers across cell boundaries and between the Extended Area and the Primary Area, within the following parameters:
- (a) [REDACTED]
 - (b) [REDACTED]
 - (c) [REDACTED]
- 5.3.11 The Supplier Solution shall ensure continuity of service when the User Device transfers between radio access types.
- 5.3.12 As part of the detailed design phase, the Supplier shall agree the following with Other ESN Suppliers and the Authority in order to establish fair use of Bearers:
- (a) an agreed list of Bearers to be supported, based on the list of Bearer Types in Annex H (Bearer and Connection Types);
 - (b) QCI and ARP parameters to be used for each Bearer Type;
 - (c) relative priorities and pre-emption parameters, based on the Bearer Types in Annex H (Bearer and connection Types);
 - (d) Traffic Flow Template rules for each Bearer Type;
 - (e) typical bit rates and maximum bit rates per Guarantee of Bit Rate Bearer Type; and
 - (f) initial forecast of ESN Users per Guaranteed Bit Rate Bearer Type;
- 5.3.13 The Supplier Solution may reject requests to establish Guaranteed Bit Rate bearers exceeding the maximum bit rate agreed with the US Supplier and the Authority. The Supplier shall collaborate with

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the US Supplier to establish the cause of such rejections and to agree the mechanism for how the rejection shall be implemented.

Bearer QCI and User Prioritisation Requirements

5.3.14 [REDACTED]

5.3.15 [REDACTED]

5.3.16 [REDACTED]

5.3.17 [REDACTED]

5.3.18 [REDACTED]

5.3.19 [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

5.3.21 [REDACTED]

5.3.22 [REDACTED]

5.3.23 [REDACTED]

Critical Bearers

5.3.24 The Supplier shall provide Bearers that can be used for Public Safety Communications Services (voice, video, messaging and data).

5.3.25 The Supplier Solution shall support the establishment of Bearers to carry voice, video or messaging (including attachments such as pictures and documents) group communication between a Public Safety Communications Service and a User Device. [REDACTED]

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5.3.26 The Supplier shall:

(a)



(b)



5.3.27 The Supplier Solution shall support fast and reliable Bearer setup and retention in accordance with the Performance Indicators for Radio Bearer Setup, Dedicated Bearer Setup Performance and Bearer Retainability identified in Paragraphs 15.2 and 19 of Schedule 2.2 (Performance Levels).

5.3.28 The Supplier shall work with the US Supplier to resolve instances where bearer setup does not meet the expected performance levels set out in Paragraph 5.3.27.

5.3.29 The Supplier Solution shall allow User Devices, when in radio idle mode, to be configured in the shortest paging cycle supported by 3GPP standards, and shall be designed to minimise the probability that paging is queued.

Bearer: Packet Data Considerations

5.3.30 The Supplier shall provide suitable Bearers for packet data communications.

5.3.31 The Supplier Solution shall fully support packet data Bearer set up signalling to establish Bearers to carry ESN User packet data Traffic across the US-MS Interface and to the ESN User Device.

5.4 Not used.

5.5 Solution Access and Bearers — SIMs

5.5.1 The Supplier shall ensure correctly provisioned and activated SIMs sourced and provided by the US Supplier are granted access to the Supplier Solution. The Supplier shall work with the US Supplier and the Authority to ensure compatibility of SIMs on their network including access to the network and ciphering over the Mobile Network Radio Interface.

5.6 Solution Access and Bearers - Numbering Support

5.6.1 The Supplier shall provide the Authority with access to their mobile telephone number ranges (E.164 publicly addressable numbers), including both:



5.6.2 The Supplier shall port mobile telephone numbers onto the Supplier Solution at the request of ESN Users in accordance with Ofcom regulations.

5.7 Telephony Service

5.7.1 The Supplier shall provide a Telephony service to enable ESN Users to make Telephony calls subject to the User Subscription's access rights that are configured in the Mobile Subscriber Server.

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- 5.7.2 The Supplier shall provide a Telephony service with at least the same level of priority and quality as that provided to Other Customers.
- 5.7.3 The Supplier shall support the establishment of User Device originated voice communication.
- 5.7.4 The Supplier shall support the establishment of User Device terminated voice communication.
- 5.7.5 The Supplier shall provide indication (visual or audible) via the User Device in the instances that Telephony communications cannot be established while the User Device is connected to the Supplier Solution.
- 5.7.6 The Supplier Solution shall allow for the initiation of an Emergency Distress Communication within the US Supplier Solution when the User Device is involved in a Telephony call.

5.8 Telephony Supplementary Service

- 5.8.1 The Supplier shall provide Telephony supplementary services (including call forward unconditional, call forward conditional, call waiting, call barring, call hold and call rejection) in compliance to global Open Standards for all PSTN calls if allocated to the User Subscription Profile.
- 5.8.2 The Supplier shall enforce barring of incoming calls for calls from the PSTN, by User Subscription, as set on the Mobile Subscriber Server, including calls from:
 - (a) specific numbers;
 - (b) defined number groups including calls from international numbers and numbers specified by the Authority; and
 - (c) all calls.
- 5.8.3 The Supplier Solution shall enforce the prevention of outgoing Telephony calls for specified User Subscriptions to specified numbers and specified types of numbers, as set on the Mobile Subscriber Server e.g. restricting calls to international numbers to 0898 numbers and high premium rate calls 0900.
- 5.8.4 Not used.
- 5.8.5 Not used.
- 5.8.6 The Supplier shall support in the Supplier Solution a capability for a presentation CLI of a User Organisation defined or Authority defined mnemonic (e.g. extension number and switchboard number) in order to facilitate ease of recognition of calling party if set in the Mobile Subscriber Server.
- 5.8.7 The Supplier Solution shall, if set on the Mobile Subscriber Server, withhold display of ESN Users' CLIs to PSTN users (e.g. when calls are placed between ESN and the PSTN).
- 5.8.8 The Supplier shall, where provisioned on the Mobile Subscriber Server, display an ESN User-determined caller identity and number to public network users when they receive calls from an ESN User.
- 5.8.9 The Supplier Solution shall make available voicemail boxes provisionable by the ESN User.
- 5.8.10 The Supplier shall provide an API based interface to their voicemail service platform allowing provisioning and configuration of voicemail boxes via a provisioning system within the US Supplier Solution.
- 5.8.11 The Supplier shall ensure voicemail boxes provided for a User Subscription forces an ESN User to change the default PIN as part of initial set up.

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- 5.8.12 The Supplier Solution shall provide unconditional call forwarding to any destination (subject to any User Subscription's barred destinations) for their Telephony service as provisioned via the Mobile Subscriber Server.
- 5.8.13 The Supplier Solution shall provide conditional call forwarding to any destination (subject to any User Subscription's barred destinations) for their Telephony service, according to the conditions set on the Mobile Subscriber Server. The call forward conditions shall include:
- (a) call forward on busy;
 - (b) call forward on not reachable;
 - (c) call forward on no answer, with ESN User configurable timeout; and
 - (d) call forward on call rejection.
- 5.8.14 The Supplier Solution shall support conditional and unconditional call forwarding to a voicemail box where voicemail has been provisioned for a User Subscription and where call forwarding has been configured on the Mobile Subscriber Server.
- 5.8.15 The Supplier Solution shall, if provisioned via the Mobile Subscriber Server, support call waiting, which shall include:
- (a) providing a tone indication of a waiting call to the ESN User; and
 - (b) enabling the User to switch between the original call and the waiting call.
- 5.8.16 The Supplier Solution shall, if provisioned via the Mobile Subscriber Server, allow an ESN User to put an active call on hold.
- 5.8.17 The Supplier Solution shall allow a User to reject an incoming call. Where configured, a rejected call shall forward to the User-determined destination (in accordance with Paragraph 5.8.13), otherwise an applicable tone or announcement shall be played back to originator of the rejected call.

5.9 Short Messaging Service

- 5.9.1 The Supplier shall enable ESN Users with the appropriate permission on their User Subscription Profile to send and receive text to members of the general public that have mobile devices capable of SMS. The capability provided shall also be available for communication between ESN Users.

6 Technical Interfaces

6.1 Technical Interfaces Overview

- 6.1.1 The Supplier shall provide services including:
- (a) interfaces to Other ESN Suppliers, as set out in this Paragraph 6;
 - (b) standards for interfaces, as set out in Paragraph 0;
 - (c) design of interfaces, as set out in Paragraph 6.4
 - (d) management of interfaces through the controls set out in Paragraph 6.9; and
 - (e) type approval services, as set out in Paragraph 6.10.

6.2 Integration Management Plan

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- 6.2.1 The Supplier shall develop, submit and agree with the Authority, an integration management plan, ("Integration Management Plan") as set out in Schedule 6.1 (Implementation Plan), and which may be amended by the Rebaseline process as described in Schedule 8.2 (Change Control Procedure).
- 6.2.2 The Supplier shall ensure the Integration Management Plan includes:
- (a) methods and processes for integration;
 - (b) resources required; and
 - (c) timescales, and how these will be applied to the different components of the Supplier Solution.

6.3 Overall Architecture Design Specification

- 6.3.1 The Supplier Solution shall support the overall architecture design set out in Paragraph 6.3 between ESN Suppliers.
- 6.3.2 The Supplier shall deliver, commission and integrate all Mobile Core Network and IT infrastructure, applications and telecommunications functions with associated hosting for the ESN Environments which are required to operate the ESN Services in conjunction with the services provided by Other ESN Suppliers.
- 6.3.3 The Supplier shall commission and integrate a Dedicated Core Network and IT infrastructure with Other ESN Suppliers in accordance with the ESN Technical Architecture Documentation and the Design Documentation (see Paragraph 6.10.9).

Mobile Core Network

- 6.3.4 The Supplier shall deliver and implement [REDACTED] and the required operations and business support interfaces, as described in the ESN Technical Architecture.
- 6.3.5 [REDACTED]
- 6.3.6 [REDACTED]
- 6.3.7 [REDACTED]
- 6.3.8 [REDACTED]
- (a) [REDACTED]
 - (b) [REDACTED]

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- (c) [REDACTED]
- (d) [REDACTED]
- (e) [REDACTED]
- (f) [REDACTED]
- (g) [REDACTED]
- (h) [REDACTED]

6.3.9 [REDACTED]

- (a) [REDACTED]
- (b) [REDACTED]
- (c) [REDACTED]
- (d) [REDACTED]
- (e) [REDACTED]
- (f) [REDACTED]
- (g) [REDACTED]
- (h) [REDACTED]

6.3.10 [REDACTED]

6.3.11 The Supplier shall support an architecture with policy control via a Policy Control Server and Policy Control Function within the US Supplier Solution for all traffic via the US Supplier Mobile Network Gateway. This Policy Control Server shall:

- (a) provide policy profiles for QCI/5QI and ARP per User Subscription;
- (b) ensure policies adhere to bounds agreed with the US Supplier and the Authority; and
- (c) a range of other policy control functions as defined in 3GPP 23.401, and 3GPP 23.501.

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- 6.3.12 The Supplier shall provide a Policy Control Server and Policy Control Function that will interface with relevant network entities in the Supplier Solution and the US Supplier Solution to provide policy control for services provided by the Supplier to meet requirements of Paragraphs 5.2.6 (Internet Connectivity), 5.7 (Telephony Service), 5.8 (Telephony Supplementary Service) and 5.9 (Short Messaging).

6.4 US-MS Interfaces

- 6.4.1 The Supplier shall provide interfaces between the US Supplier Solution and the Supplier Solution including:

- (a) US-MS Physical Interface;
- (b) subscriber management interface;
- (c) Policy Control Server/function interface;
- (d) Mobile Network Gateway interface;

[REDACTED]

- (f) service management interface;
- (g) billing interface;
- (h) management reporting interface; and
- (i) a range of interfaces defined in the AU000862 ESN Technical Architecture document.

US-MS Physical Interface

- 6.4.2 The Supplier shall provide a physical interface from the Supplier Solution to the US Supplier's provided POIs in order to provide connectivity between the US Supplier Solution and the Supplier Solution (the "**US-MS Physical Interface**").
- 6.4.3 The Supplier shall ensure that connectivity specified for the US-MS Physical Interface is upgradeable and maintainable without service disruption.
- 6.4.4 The Supplier shall provide sufficient full independent links to the US Supplier's POIs so that in the event of the loss of any one link, service shall be maintained with minimal disruption and sufficient capacity. It shall therefore:
- (a) ensure no single point of failure;
 - (b) meet the availability levels specified within Schedule 2.2 (Performance Levels); and
 - (c) provide links to the US Supplier POIs on an active-active load share basis to minimise disruption to ongoing sessions in the event of a link failure.

Subscriber Management Interface

- 6.4.5 The Supplier shall provide a subscriber management interface between the US Supplier Solution and the Supplier Solution that will provide the following to the extent such interfaces are required for the provision of the Services in accordance with this Schedule 2.1, including:
- (a) [REDACTED] interfaces to the Mobile Subscriber Server;

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- (b) interface to the US Supplier Solution from any Equipment Identity Register that allows [REDACTED] of device IMEI, and binding of device IMEI to IMSI;
 - (c) any further interfaces to any Supplier systems to allow SIMs sourced and provided by the US Supplier to access the Mobile Communication Services; and
 - (d) any further interfaces required for delivery of the Mobile Communications Services.
- 6.4.6 The Supplier shall support a 3GPP-compliant [REDACTED] interfaces across the US-MS Interface to allow the Supplier Solution to determine ESN User permissions to access the Supplier Solution and which functions they can access. This shall be based upon the User Subscription Profiles held in the Mobile Subscriber Server. 3GPP-compliant legacy interfaces shall also be supported, if required by either the Supplier or the US Supplier to support their Solutions. Information exchanged shall include:
- (a) network Bearer types, teleservices and network supplementary services permitted per subscriber; and
 - (b) barring of services and call types.

Policy Control Interface

- 6.4.7 The Supplier Solution shall define and the Supplier shall agree with the US Supplier and the Authority any constraints that must be applied to ESN User policies set on the US Supplier managed Policy Control Server/Function (as described in 3GPP TS 23.503 and 3GPP TS 23.203) for voice and data services provided through the US Supplier Solution. This includes where applicable:
- (a) QCI/5QI Parameters;
 - (b) ARP parameters; and
 - (c) Pre-emption parameters.
- 6.4.8 The Supplier Solution shall define and the Supplier shall agree with the US Supplier and the Authority any applicable policies applied to ESN Users on the Supplier's Policy Control Server for Services. This includes where applicable:
- (a) QCI/5QI Parameters;
 - (b) ARP parameters;
 - (c) pre-emption parameters; and
 - (d) any specific (and agreed) policy profiles that are applicable (e.g. DSCP marking, 5-tuple filter rule base, DPI rule base).
- 6.4.9 The Supplier shall provide a suitable interface between the US Supplier Solution and the Supplier Solution to support the provisioning and policing of policies on the Supplier's Policy Control Server/Function, to the extent such an interface is required for the provision of the Services in accordance with this Schedule 2.1 (Services Description).

Mobile Network Gateway Interface

- 6.4.10 The Supplier shall provide [REDACTED] to the US Supplier's Mobile Network Gateway as defined in Paragraph 6.3.9.
- 6.4.11 The Supplier Solution shall enable traffic from the US Supplier Solution to the User Device to request and have provided the appropriate Quality Of Service for that Traffic.

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- 6.4.12 The Supplier Solution shall enable Traffic delivered to the Supplier Solution from a User Device to request and have provided the appropriate Qualities Of Service for that Traffic.
- 6.4.13 The Supplier shall ensure that the Mobile Network Gateway interface and the Supplier Solution supports the Bearers required for communications using the Public Safety Communications Service and any necessary Open Standards required to ensure its operation.

5G Service Based Interface

- 6.4.14 The Supplier shall provide 3GPP-compliant [REDACTED] and a range of 5G signalling reference points to the US Supplier's Mobile Core Network as defined in Paragraph 6.5 and ESN Technical Architecture.
- 6.4.15 The Supplier shall protect the [REDACTED] interface which transport several 5G signalling reference points by deploying the SEPP systems.

Roaming Interface

- 6.4.16 The Supplier shall provide 3GPP-compliant 4G and 5G signalling plane ([REDACTED]) and user plane [REDACTED] reference points between the MS Network and the US Supplier's Mobile Core Network to enable roaming into the MS supplier's commercial network and continue to use the MCX and other ESN services over 4G and 5G coverage, in a situation when ESN coverage is not available (2G/3G access shall not be supported for ESN Users).
- [REDACTED]
- [REDACTED]

Billing Interface

- 6.4.18 The Supplier shall provide an interface between its billing processing systems and the US Supplier's billing systems to transfer batch files of Communication Data Records and usage daily summary files produced by the Supplier's network.
- 6.4.19 The Supplier shall provide an interface between its billing processing systems and the US Supplier's billing systems to receive billing information reports by the MS Supplier to facilitate billing and payments reconciliation/revenue assurance.
- 6.4.20 The Supplier shall provide an interface between the US Supplier's billing system and the Supplier's short message service centre for sending billing notifications and alerts (invoice readiness, usage alerts, and dunning to the customer using SMS notification).

Service Management and Management Reporting Interfaces

- 6.4.21 The Supplier shall provide an interface to the ESN Service Management System as set out in Paragraph 8.1.
- 6.4.22 The Supplier shall provide an interface to provide reporting information as set out in Annex D and AU000862 ESN Technical Architecture document_in accordance with the ICD provided by the US Supplier.
- 6.4.23 The Supplier shall provide an interface to the self-service portal (deployed at the US supplier's network) from the coverage visualisation tool (Coverage Portal) for supporting authentication and authorisation of the access request to the Coverage Portal.

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Approved User Devices and SIMs List Interface

6.4.24 Not used.

Order Management and provisioning Interface

6.4.25

6.4.26

6.4.27

6.4.28

6.4.29

6.5 ES-MS Network Interface

6.5.1 The Supplier shall provide the design to support an interface (the "ES-MS Network Interface"), based on [REDACTED], between the Supplier Solution and the ES Backhaul Network.

6.5.2 The Supplier shall support an interface across the ES-MS Network Interface to transport information including:

- (a) in-band signalling;
- (b) voice communication (including Public Safety Communications Service voice communications and Telephony);
- (c) data communication;
- (d) network signalling;
- (e) mobility management;
- (f) session management;
- (g) interference management;
- (h) load management (e.g. handover between G2A (including EAS) and A2G while supporting mission critical QCLs); and
- (i) fault alarms from the Supplier's equipment installed in the Extended Area.

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- 6.5.3 The Supplier shall provide connectivity to the Supplier's Dedicated Core Network.
- 6.5.4 The Supplier shall work with Authority to agree the Supplier's proposed interface control document for the ES-MS Network Interface, ensuring that the interface implementation is suitable for the transport of real-time voice and video Traffic in terms of bandwidth, latency, jitter and any other characteristics required for reliable transport of these services.
- 6.5.5 The Supplier shall provide resilient connectivity to Dedicated Core Network sites so that in the event of the loss of any one link, service shall be maintained with minimal disruption and sufficient capacity.
- 6.5.6 The Supplier shall ensure Quality of Service and User Priority (set in the Policy Control Servers) is maintained across the ES-MS Network Interface.
- 6.5.7 The Supplier shall ensure that the ES-MS Network Interface shall be secure in accordance with Schedule 2.4 (Security Management).

MS-A2G Network Interface

- 6.5.8 The Supplier shall provide the design to support an interface (the "A2G-MS Network Interface"), based on 3GPP based interfaces [REDACTED] between the Supplier Solution and the A2G Backhaul Network.
- 6.5.9 The Supplier shall support an interface across the A2G-MS Network Interface to transport information including:
 - (a) in-band signalling;
 - (b) voice communication (including Public Safety Communications Service voice communications and Telephony);
 - (c) data communication;
 - (d) network signalling;
 - (e) mobility management;
 - (f) session management;
 - (g) interference management;
 - (h) load management (e.g., handover between A2G cells, between A2G & G2A cells vice versa while supporting mission critical QCLs); and
 - (i) fault alarms from the Supplier's equipment installed in the A2G network.
- 6.5.10 The Supplier shall work with the Authority to agree the Supplier's proposed interface control document for the A2G-MS Network Interface, ensuring that the interface implementation is suitable for the transport of real-time voice and video Traffic in terms of bandwidth, latency, jitter and any other characteristics required for reliable transport of these services.
- 6.5.11 The Supplier shall ensure Quality of Service and User Priority (set in the Policy Control Servers) is maintained across the A2G-MS Network Interface.
- 6.5.12 The Supplier shall ensure that the A2G-MS Network Interface shall be secure in accordance with Schedule 2.4 (Security Management).

6.6 Standards

- 6.6.1 The Supplier shall ensure they use Open Standards, where available, in accordance with Schedule 2.3 (Standards) for all interfaces to:

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- (a) Authority and User Organisation systems;
- (b) User Devices; and
- (c) between the Supplier Solution and ESN Suppliers' solutions.

6.6.2 The Supplier shall ensure that, where open interface standards are not available:

- (a) if a Replacement Supplier takes over provision of the Service in the future the Replacement Supplier would be able to replicate all elements of the interface;
- (b) all non-standard interfaces are fully documented and made available to support any future transition to a Replacement Supplier; and
- (c) third party suppliers that will need to integrate with the interface shall have full access to interface documentation, APIs and testing facilities.

6.7 Design Governance Processes

6.7.1 The Supplier shall create, submit and agree with the Authority a Design Governance Process ("the Design Governance Process"), with agreed representation from the Authority. The Design Governance Process shall be in place in line with Schedule 6.1 (Implementation Plan).

6.7.2 The Supplier shall ensure the Design Governance Process includes at least:

- (a) change control;
- (b) issue resolution;
- (c) management of design reviews;
- (d) management of the publication or other communication of design information to third parties including User Organisations and suppliers of hardware and software; and
- (e) type approval of systems to connect to the Supplier Solution, including User Devices.

6.7.3 The Supplier shall agree any changes to interfaces with other ESN Supplier systems with both the relevant ESN Supplier and the Authority. Requests for changes must comply with Paragraph 8.10, and Schedule 8.2 (Change Control Procedure).

6.7.4 Where another ESN Supplier requests a change to an interface with the Supplier, the Supplier shall consider the changes with the Authority and the other ESN Supplier and enable those changes once agreed, in accordance with Schedule 8.2 (Change Control Procedure).

[REDACTED]

[REDACTED]

6.7.7 The MS Supplier shall hold regular future strategy meetings with the Authority at a minimum of 6 monthly intervals and more frequently if agreed.

- 6.8.1 The Supplier shall create, submit and agree with the Authority, comprehensive architecture design documentation ("Architecture Design Documents") of the Supplier Solution in line with the dates set out in Schedule 6.1 (Implementation Plan) and the processes set out in Part B Schedule 6.2 (Testing and Assurance Procedures).
- 6.8.2 The Supplier shall provide information including, but not limited to, BCDR, Security and, performance aspects in appropriate design documentation.
- 6.8.3 The Supplier shall contribute to the production and maintenance of the following Authority-produced Architecture Design Documents via the Architecture Review Group:
 - (a) ESN technical architecture;
 - (b) ESN Technology Roadmap;
 - (c) ESN target system architecture; and
 - (d) ESN enterprise security architecture.
- 6.8.4 The Supplier shall maintain the Architecture Design Documents under change control in accordance with Schedule 8.2 (Change Control Procedure), throughout the Term.
- 6.8.5 The Supplier shall ensure the appropriate Architecture Design Documents cover how the proposed architecture fulfils the requirements and shall include at least the following:
 - (a) business process descriptions and workflows;

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- (b) design principles;
 - (c) descriptions of system components in terms of their function, how they support business processes and the hardware and software technologies used;
 - (d) application interactions and data flows;
 - (e) data models;
 - (f) physical deployment and connectivity of components;
 - (g) resilience;
 - (h) availability, as it relates to resilience;
 - (i) Capacity, as it relates to Bearer performance;
 - (j) scalability, as it relates to the Mobile Core Network demand;
 - (k) performance, in order to consider optimisation of bearer performance and best use of Available Capacity;
 - (l) security controls including remote access;
 - (m) the transport technology, IP design and of the LAN and WAN;
 - (n) how standard protocols are supported;
 - (o) MS radio plan taking into account the Extended Area Radio Plan;
 - (p) contributions to the ESN Technology Roadmap, including in relation to the migration to Open Standards;
 - (q) rationale for architectural decisions; and
 - (r) risks, constraints and assumptions.
- 6.8.6 The Supplier shall work proactively and collaboratively with the Authority and US Supplier to deliver a bearer design suitable for the services being delivered.
- 6.8.7 The Supplier shall work with the Authority and US Supplier to trial any appropriate bearer design options and adapt as required to improve performance. This will be an iterative process and shall include:
- (a) a bearer design that takes into account and incorporates developments within the agreed 5G roadmap for ESN;
 - (b) a detailed review of all bearers used across the ESN design to ensure that the bearer design complies with the 3GPP standard;
 - (c) potential use of operator defined QCI/5QIs for increased priority for User Organisation data services;
 - (d) modification of the bearer attributes included the QCI/5QI or data rates within a data session; and
 - (e) the review of all bearers used across the ESN design including the use of high priority QCI/5QI [REDACTED] mission critical data services on the PSCS APN.

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6.8.8 The Supplier shall prepare for, attend, and input into design workshops run by the US Supplier with the Authority and Other ESN Suppliers attending. The first design workshop shall be held within [REDACTED] and shall enable:

- (a) ESN Suppliers to review the overall design and confirm common understanding of interfaces between suppliers;
- (b) ESN Suppliers to complete high level designs for baseline submission and agreement by the Authority;
- (c) the US Supplier to complete an End-to-End Service design for baseline submission and agreement by the Authority;
- (d) agreement of dependencies between ESN Suppliers and between ESN Suppliers and the Authority; and
- (e) confirmation of timescales to complete design work by ESN Suppliers.

6.8.9 The Supplier shall prepare for, attend, and input into regular radio plan design workshops run by the Authority. The first design workshop shall be held within [REDACTED]. The MS radio plan design workshops shall enable:

- (a) optimisation of the radio plan design to better meet requirements, taking into account the Extended Area;
- (b) identification radio design options (Macro, Pico, or Femto) to better meet requirements;
- (c) identification of Base Stations with minimal coverage contribution;
- (d) identification of Base Stations with high delivery risk;
- (e) ESN Suppliers to complete high level designs for baseline submission and agreement by the Authority; and
- (f) confirmation of timescales to complete design work by ESN Suppliers.

6.9 Interface Control Documentation

6.9.1 The Supplier shall create, submit and agree with the Authority, in line with Schedule 6.1 (Implementation Plan), and maintain under change control, the ICDs that cover:

- (a) the physical interface to the US Supplier's provided POIs;
- (b) the Mobile Network Radio Interface;
- (c) the subscriber management interface;
- (d) the policy control interface;
- (e) the Mobile Network Gateway interface;
- (f) the multicast interface [REDACTED]
- (g) the billing interface;
- (h) Equipment Identity Register for the purposes of blacklisting.
- (i) Authorised access to Coverage Portal interface; and

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- (j) 5G user plane and control plane interfaces will be added to the existing network interface documents where appropriate.
- 6.9.2 The Supplier shall ensure the ICDs provided include the Mobile Network Radio Interface with User Devices. This shall align with the User Device Type Approval Specification ("UDTAS"), set out in Paragraph 6.10.2.
- 6.9.3 The Supplier shall ensure the ICDs provided define the physical and transport definition between the US Supplier Solution and the Supplier Solution based on Open Standards.
- 6.9.4 The Supplier shall ensure the ICDs provided define the interface between the Mobile Subscriber Server and the Supplier Solution based on Open Standards.
- 6.9.5 The Supplier shall ensure the ICDs provided define the interface between the US Supplier's Mobile Network Gateway and the Supplier Solution based on Open Standards.
- 6.9.6 The Supplier shall ensure the ICDs provided define any interface necessary to support policy and rules control. This shall include network interfaces based on Open Standards and provisioning interfaces and include details of how policies are bounded and how policies may be rejected in the event that agreed bounds are breached.
- 6.9.7 The Supplier shall ensure the ICDs provided define the multicast interface definition [REDACTED] between any Open Standards based multicast platforms in the Supplier Solution and the Public Safety Communication Services.
- 6.9.8 The Supplier shall ensure the ICDs provided define the interface between the Supplier's billing record processing systems and the US Supplier's billing systems. The transfer protocol shall be based upon open or widely used industry standards in agreement with the US Supplier and the Authority.
- 6.9.9 The Supplier shall support the US Supplier in the definition of the ICDs to provide reporting information as set out in Paragraph 9 from entities within the Supplier Solution to the relevant systems in the US Supplier Solution, using open or widely used industry standards where applicable.
- 6.9.10 The Supplier shall, from the Effective Date, work with the Authority and the Other ESN Suppliers to ensure the ICDs are updated as may be required to reflect the move to an incremental release of ESN Products.
- 6.9.11 The Supplier shall ensure the ICDs provided give a complete description of each interface, so as to enable a third party to provide an interface into the relevant system, including:
 - (a) the purpose and communications services that will use it;
 - (b) a description of the interface using a standardised reference model appropriate to the interface proposed;
 - (c) configurations for the interface;
 - (d) protocols and standards to be used; and
 - (e) specifications for relevant APIs in sufficient detail to allow third party suppliers to develop compatible interfaces for their systems.
- 6.9.12 The Supplier shall make agreed ICDs available to the Authority, User Organisations and interested third parties, such as equipment or software vendors, at the request of the Authority, and directly to third parties where this has been agreed by the Authority.
- 6.9.13 The Supplier shall ensure the ICDs provided include 3GPP-compliant 5G User plane reference points, [REDACTED] and a range of 5G signalling reference points to the US Supplier's Mobile Core Network as defined in Paragraph 6.5 and ESN Technical Architecture.

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6.10 Type Approval Services

- 6.10.1 The Supplier shall provide a User Device Type Approval Service, available in accordance with the dates in Schedule 6.1 (Implementation Plan), for third party suppliers of User Devices needing to connect to the Supplier Solution.
- 6.10.2 The Supplier shall submit a UDTAS, available in accordance with the dates in Schedule 6.1 (Implementation Plan), to the Authority and the US Supplier for User Devices and Aircraft User Devices detailing all the requirements of a User Device that must be fulfilled in order to gain type approval.
- 6.10.3 The Supplier shall carry out testing of User Devices when requested by the US Supplier or by the Authority, as part of its User Device Type Approval Service and ensure results are available within [REDACTED] of a request being made.
- 6.10.4 The Supplier shall provide a User Device Type Approval Service that aligns with the Supplier's User Device Type Approval Specification.
- 6.10.5 The Supplier shall provide warranted certification that the device is compatible with the Supplier Solution and will not impact the security or performance of the Supplier Solution.
- 6.10.6 The Supplier shall provide to the Authority and to the US Supplier the results of all completed tests of devices within [REDACTED] of the tests being completed.
- 6.10.7 Where a device fails type approval the Supplier shall provide to the Authority and the US Supplier details of which section of the User Device Type Approval Specification the device has failed to meet, how and why the device failed to meet the User Device Type Approval Specification, and guidance on what measures would be required in order for the device to pass type approval in the future.
- 6.10.8 The Supplier shall on request, available in accordance with the dates in Schedule 6.1 (Implementation Plan), provide third party suppliers and the Authority with details of how the User Device Type Approval Service operates, including:
- (a) items in scope for approval;
 - (b) test procedures and specifications; and
 - (c) charges for use of the service.
- 6.10.9 The Supplier shall ensure the User Device Type Approval Service is available in accordance with the dates in Schedule 6.1 (Implementation Plan).
- 6.10.10 The Supplier shall provide to the Authority and the US Supplier on a quarterly basis, in accordance with the dates in Schedule 6.1 (Implementation Plan), details of devices which:
- (a) have successfully achieved type approval by the Supplier; and
 - (b) the Supplier intends to carry out testing with a view to achieving type approval over the following 12 months.

6.11 Reference System

- 6.11.1 The Supplier shall make available the MS Supplier Reference System when required, which shall form part of the ESN Reference System. The Supplier shall ensure the MS Supplier Reference System is representative of the Supplier Solution.
- 6.11.2 The Supplier shall submit and agree with the US Supplier and the Authority a process and SLA to request access for use of the MS Supplier Reference System. The Supplier shall not unreasonably withhold or delay any reasonable request for access to the MS Supplier Reference System.

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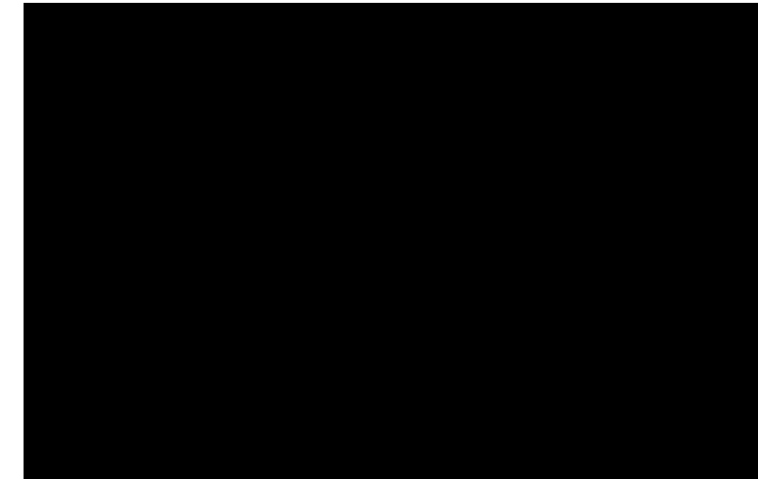
- 6.11.3 The Supplier shall host the MS Supplier Reference System within Great Britain.
- 6.11.4 The Supplier shall submit and agree with the US Supplier and the Authority a design for the MS Supplier Reference System. The design shall maximise the use of existing reference system facilities operated by the Supplier in order to minimise additional investment by the Authority whilst providing the capability of testing the ESN Products and the End-to-End Services.
- 6.11.5 If the Authority requests that additional infrastructure is required for the testing and management of ESN Products, the Supplier shall use reasonable endeavours to:
 - (a) minimise any cost impact to the Authority; and
 - (b) ensure that any such additional infrastructure and environments are available for operational use on the earlier of:
 - (i) the date of the first release of products for operational use; and
 - (ii) the date on which each MCX software release is available for installation and testing in the ESN Reference System.
- 6.11.6 The Supplier shall define and agree with the Authority and the US Supplier any interconnection and interfaces between the MS Supplier Reference System and the US Supplier Reference System. The interconnection and interfaces shall emulate the live production environment.
- 6.11.7 The Supplier shall provide connectivity from the MS Supplier Reference System to the POI provided by the US Supplier for the US Supplier Reference System.
- 6.11.8 The Supplier shall integrate the MS Supplier Reference System, which forms part of the ESN Reference System, to the US Supplier Reference System.
- 6.11.9 The Supplier shall install and commission in the US Supplier Reference System equipment defined in the ESN Reference System design which emulates the Mobile Network Radio Interface. The Supplier shall provide any operating instructions required by the US Supplier for use of equipment provided.
- 6.11.10 The Supplier shall maintain equipment installed in the US Supplier Reference System. The Supplier shall agree any maintenance plans and/or activities with the US Supplier.
- 6.11.11 The Supplier shall maintain release levels and configuration records for their elements of the US Supplier Reference System and for the MS Supplier Reference System. The Supplier shall provide the records to the Authority and the US Supplier to allow an overall ESN Reference System configuration record to be maintained. The Supplier shall agree any changes with the Authority and the US Supplier.
- 6.11.12 The Supplier shall ensure continued availability of the MS Supplier Reference System and ESN Reference System is maintained. Any proposed outage of part or all of the ESN Reference System shall be agreed by the Supplier with Authority. The Supplier shall provide the Authority with a minimum of [REDACTED] of any proposed outage.
- 6.11.13 The Supplier shall provide their elements of the ESN Reference System in a way which enables testing to be performed against:
 - (a) the existing release level used on the live ESN Service;
 - (b) any proposed new release level for the live ESN Service; and
 - (c) interaction between release levels where the live ESN Service must operate between the existing release level and the proposed new release level.

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6.11.14 The Supplier shall agree any proposed changes in ESN release levels with the Authority in accordance with Schedule 8.2 (Change Control Procedure).

6.11.15 The Supplier shall install A2G network equipment (

6.11.16 The Supplier shall install A2G Network equipment (materials stipulated in the charges section of Transferred CAN CR387C) onto the 7 trial site locations listed below:



6.11.18 The Supplier shall provide, install and maintain Network equipment into [REDACTED] US Supplier Reference System sites to enable representative testing over 4G and 5G bearers. This Network equipment shall include bearers (eNodeB, gNodeB), antennas, booths / cages and associated connectivity to the US Supplier Reference sites.

6.11.19 The Supplier shall work collaboratively with the Authority, US Supplier and Other ESN Suppliers to identify and deliver solutions and appropriate controls that enable access to the Radio Access Network from non-productions environments to support testing, assurance, evaluation and live support of the Services.

7 Availability and Capacity of the Services

7.1 Availability of the Service – Primary Area and Extended Area

7.1.1 The Supplier shall achieve the target performance levels specified in Schedule 2.2 (Performance Levels).

7.1.2 The Supplier shall identify components within the Supplier Solution, as at the Effective Date, for which a power outage would lead to a loss of Service from a contiguous group of [REDACTED]



7.1.3 The Supplier shall maintain the solutions as required in Paragraph 7.1.2 for the Term.

7.1.4 The Supplier shall deliver to the Authority, [REDACTED]

[REDACTED] for which a power outage would lead to a loss of the ESN Service that would impact on the following Coverage scenarios:

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- (a) [REDACTED]
 - (b) Outdoor Handheld or Vehicle Coverage on and off road at locations provided by the Authority.
- 7.1.5 The Supplier shall provide the following Services in support of the Mobile Communications Service and, where appropriate, shared rural network in the Extended Area:
- (a) [REDACTED]
 - (b) [REDACTED]
 - (c) [REDACTED]
 - (d) maintain [REDACTED] power resilient solutions throughout the Term.
- 7.1.6 The Supplier shall ensure that the volume of power resilient solutions specified in Paragraphs 7.1.4, and 7.1.5 [REDACTED] (as described in Schedule 8.2 (Change Control Procedure)), are deployed and activated by the Mobilisation Complete milestone as described in Schedule 6.1 (Implementation Plan) to enable the identified Base Stations to operate without impairment for a [REDACTED].
- 7.1.7 For those power resilient solutions described in Paragraphs 7.1.4, 7.1.5 and 7.1.6 above the Supplier shall prepare and implement plans to extend this time in the event of a power outage of more than [REDACTED].
- 7.1.8 Following an Ofcom determination that Mobile Network Operators should ensure that any Core Site or Metro Site should operate without impairment for a minimum of [REDACTED] the Supplier shall implement power resilience solutions to those sites that support the Mobile Communication Service as part of the Suppliers Solution.
- 7.1.9 For any power resilient solutions described in Paragraph 7.1.8 the Supplier shall prepare and implement plans to extend this time in the event of a power outage of more than [REDACTED].
- 7.1.10 The Supplier shall ensure that any Base Station upgraded with a Power Resilient Solution will have transmission connectivity that enables the Mobile Communication Services to remain active in the event of a power outage.
- 7.1.11 The Supplier shall ensure that the Power Resilient Solution is designed to prioritise support for the Mobile Communications Service in the event of a power outage.
- 7.1.12 The Supplier shall for each Resilient Power Solution deployed and commissioned provide the following:
- (a) A completion certificate for sites in the Primary Area;
 - (b) A completion certificate for Core Sites and Metro Sites; and
 - (c) A Handover Pack for sites in the Extended Area
- 7.1.13 The Supplier shall carry out annual maintenance checks on the anniversary of the Power Resilient Solution being activated and provide evidence of such to the Authority within [REDACTED] of the anniversary of the Power Resilient Solution being activated.

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7.2 Capacity of the Services

- 7.2.1 The Supplier shall provide sufficient Capacity to meet the volumes of ESN Users, User Devices and Traffic to meet the operational requirement in all locations where Coverage is provided in accordance with the current and forecast national levels of demand, whilst satisfying the performance requirements for the Services as set out in Schedule 2.2 (Performance Levels).
- 7.2.2 The Supplier shall continue to report details of Capacity provided and Traffic usage in line with Annex D (Data Capture and Reporting Specification).
- 7.2.3 The Supplier shall ensure that its solution is sufficiently sized to provide connectivity to meet forecast levels of ESN demand. [REDACTED]
- 7.2.4 The Supplier's solution shall be capable of scaling if demand is predicted to exceed forecast levels of traffic and usage. In the event that the Authority requires RAN capacity expansion to support ESN User demand this will be ordered through the Optional Services Catalogue. The Capacity requirements will be reviewed by both Parties in the Single Supplier Board on a quarterly basis; and as part of this board both Parties shall agree a Capacity management process. Any Dedicated Core Network expansions required, due to greater demand, will be requested by the Authority with a minimum of [REDACTED].
- 7.2.5 The Supplier shall provide a Coverage Portal that will enable the Authority, US Supplier and User Organisations to visualise the Coverage and Capacity aspects of geographical areas in the form of a RAN capacity heatmap.
- 7.2.6 The Supplier shall support, in collaboration with the Authority, Other ESN Suppliers and User Organisations, the documentation of operational procedures that can be used to make best use of Available Capacity at Planned Events and Spontaneous Events where appropriate. [REDACTED]
- 7.2.7 The Supplier shall ensure that their Dedicated Core Network provides connectivity for the 3ES services for [REDACTED] ESN Users, including an active concurrent ESN User percentage of [REDACTED], with Capacity requirements reviewed in the Single Supplier Board on a monthly basis.
- 7.2.8 The Supplier shall, in collaboration with Other ESN Suppliers, optimise bearer performance to make best use of Available Capacity. The Supplier shall ensure that [REDACTED] and a limited number of capacity restricted access backhaul sites (i.e. satellite backhaul and rural microwave chains)) that both MCX call set-up and MCX audio/video quality are maintained to a standard that is operationally acceptable (including achievement of the KPIs MSP1, MSP2 and MSP5) for MCX communications during high loading on the MS Network.
- 7.2.9 The Supplier shall provide, within [REDACTED], an interim view on the network Capacity based on the available information. The Supplier shall update the view of current Capacity within the Coverage Portal on a quarterly basis once the Coverage Portal is available as described in Schedule 6.3 (Coverage Benchmarking and Validation Process).
- 7.2.10 The Supplier shall work with their Sub-contractors to determine and implement technically appropriate solutions to make best use of Available Capacity to ESN Users and optimise its use where appropriate and feasible.

7.3 Permanent Capacity Enhancements

- 7.3.1 The Supplier shall provide permanent Capacity enhancements to meet additional volumes of ESN Users, User Devices and User Organisation Traffic in accordance with the instructions of an individual User Organisation or the Authority.

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7.4 Additional Non-Permanent Capacity

7.4.1 The Supplier shall provide non-permanent Capacity enhancements for:

- (a) regular, known and Planned Events;
- (b) irregular, known and Planned Events, as notified by the Authority or User Organisation(s) in advance; and
- (c) Spontaneous Events as further described in Paragraph 7.4.4.

7.4.2 The Supplier shall provide non-permanent Capacity enhancements for all regular known and Planned Events as necessary without need for a request from a User Organisation to do so, in order to ensure the performance measures set out in Schedule 2.2 (Performance Levels) are met.

7.4.3 The Supplier shall provide non-permanent Capacity enhancements for irregular known and Planned Events as notified in advance where the current level of Capacity will not enable the performance measures specified in Schedule 2.2 (Performance Levels).

7.4.4 The Supplier shall use reasonable endeavours to provide non-permanent Capacity enhancements for Spontaneous Events [REDACTED] where the current level of Capacity does not or will not enable achievement of the performance measures specified in Schedule 2.2 (Performance Levels), Paragraph 15.2 (KPIs MSP1, MSP2 and MSP5).

8 Service Management**8.1 ESN Service Management System**

8.1.1 The Supplier shall be responsible for the service management of the Services.

8.1.2 The Supplier shall use the ESN Service Management System provided by the US Supplier to support integrated management of the ESN.

8.1.3 The Supplier shall ensure that data in the ESN Service Management System takes priority over data in the Supplier's own service management system.

8.1.4 The Supplier shall use the ESN Service Management System Interface to transfer data between the Supplier's service management system and the ESN Service Management System.

8.1.5 The Supplier shall ensure that the ESN Service Management System Interface supports the transfer of data to support ITIL-defined service functions.

8.1.6 The Supplier shall provide input into and shall agree the ICD and Code of Connection for the ESN Service Management System Interface to be developed by the US Supplier, to enable agreement by the Milestone set out in Schedule 6.1 (Implementation Plan).

8.1.7 The Supplier shall integrate the Supplier's service management system with the ESN Service Management System in accordance with the ICD and Code of Connection for the ESN Service Management System Interface provided by the US Supplier.

8.1.8 The Supplier shall appoint a System Administrator who shall access the ESN Service Management System and be responsible for resolving conflicts between data contained in the Supplier's service management system and data contained in the ESN Service Management System, including:

- (a) access, check, validate and update data regarding the ESN Services it is providing; and
- (b) carry out systems administration.

8.2 Supplier Service Desk

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- 8.2.1 The Supplier shall implement and operate a service desk management function ("the Supplier Service Desk") for the Services.
- 8.2.2 The service desk operated by the US Supplier will allocate Service Incidents to the Supplier Service Desk and service desks operated and provided by Other ESN Suppliers.
- 8.2.3 The Supplier Service Desk shall communicate and exchange information regarding the Services with:
 - (a) the Authority; and
 - (b) the service desks operated by the Other ESN Suppliers.
- 8.2.4 The Supplier shall operate the Supplier Service Desk as the single point of contact for all communications initiated by the Authority and service desks provided by Other ESN Suppliers.
- 8.2.5 The Supplier shall provide the Supplier Service Desk 24 hours a day, seven (7) days a week.
- 8.2.6 The Supplier shall ensure that the Authority and service desks provided by Other ESN Suppliers can communicate with the Supplier Service Desk by:
 - (a) telephone;
 - (b) email;
 - (c) text message;
 - (d) the ESN Service Management System; and
 - (e) other methods to be agreed with Other ESN Suppliers as part of the Service Management Framework.
- 8.2.7 The Supplier shall agree with the Authority and Other ESN Suppliers and set out in the Service Management Framework the appropriate level and means of communication for each type of interaction with the Authority and Other ESN Suppliers.
- 8.2.8 The Supplier Service Desk and service desks operated by the Other ESN Suppliers shall interact with each other as necessary to aid Service Incident, problems and Service Event resolution and request fulfilment.
- 8.2.9 The Supplier Service Desk shall log, prioritise, collate, manage, escalate and distribute Service Incidents, problems and Service Requests.
- 8.2.10 The Supplier shall communicate via telephone, email or text message with User Organisations directly affected by a Service Incident when agreed with the Authority to expedite Service Incident diagnosis and resolution.
- 8.2.11 The Supplier shall inform the Authority and Other ESN Suppliers of the progress of Service Incident diagnosis and resolution following every communication with a User Organisation.
- 8.2.12 The Supplier shall provide Supplier Personnel for the Supplier Service Desk:
 - (a) who are trained with an understanding of the requirements of User Organisations; and
 - (b) with security clearance where required, in accordance with Schedule 2.4 (Security Management).
- 8.2.13 The Supplier shall ensure that the Supplier Service Desk has the required systems and tools to carry out its functions.

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- 8.2.14 The Supplier shall provide the Supplier Service Desk with scripts and tools to maximise the automated diagnosis and resolution of Service Incidents.
- 8.2.15 The Supplier shall provide the service desk operated by the US Supplier with scripts and tools to maximise the number of Service Incidents diagnosed and resolved by the US Supplier during initial triage.
- 8.2.16 The Supplier shall ensure that the Supplier Service Desk updates the Authority regarding the progress towards resolution and current status of reported Service Incidents at a frequency to be defined as part of the Supplier's Service Management Framework.
- 8.2.17 The Supplier shall ensure that the Supplier Service Desk uses the ESN Service Management System as the definitive record for all Service Incidents, Service Events, problems and Service Requests.
- 8.2.18 The Supplier shall ensure that the Supplier Service Desk updates the ESN Service Management System with information regarding the Services, including the resolution of Service Incidents and problems.

8.3 Service Management Framework

- 8.3.1 The Supplier shall develop a Service Management Framework for the Services to document the components detailed in Paragraphs 8.3.2 to 8.3.16 and ensure alignment to the requirements set out in Paragraph 8.3.4.
- 8.3.2 The Supplier shall submit and agree with the Authority all component Documentary Deliverables making up the Service Management Framework using the processes set out in Part A of Schedule 6.2 (Testing and Assurance Procedures) on or before the Milestone Date for Service Management Framework as set out in Schedule 6.1 (Implementation Plan). The Service Management Framework shall include the following documents, detailed further below and taking into account Paragraph 8.3.16:
 - (a) Service Management Strategy;
 - (b) Service Portfolio;
 - (c) Service Management Processes;
 - (d) Service Management System Design;
 - (e) Service Management Organisation Plan;
 - (f) Capacity Plan;
 - (g) Availability Plan;
 - (h) Maintenance Plan;
 - (i) Operational Change management policy;
 - (j) release policy;
 - (k) Knowledge Management Strategy; and
 - (l) Continuous Improvement Plan.
- 8.3.3 The Supplier shall produce the Service Management Framework using the documentary templates provided by the US Supplier and distributed by the Authority within the Mobilisation Milestone as set out in Schedule 6.1 (Implementation Plan).

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- 8.3.4 The Supplier shall develop, implement and operate service management processes ensuring alignment with:
- (a) ITIL-aligned systems and processes, based on the current version of ITIL 2011 edition and any subsequent versions of ITIL;
 - (b) the Service Management Frameworks, systems and processes of the US Supplier and Other ESN Suppliers;
 - (c) Authority Systems and processes; and
 - (d) Good Industry Practice.
- 8.3.5 The Supplier shall provide training, using input from the Authority and User Organisations to all Supplier staff and contractors engaged in the delivery and management of the Services and Contract to raise awareness of the operations and needs of the User Organisations.

Service Management Strategy

- 8.3.6 The Supplier shall provide a Service Management Strategy that describes:
- (a) the Supplier's strategy for the delivery and management of the Services;
 - (b) the operating model deployed by the Supplier, the organisation design, governance and key people within the organisation;
 - (c) how service continuity will be provided for service management IT and processes; and
 - (d) demarcation of responsibility for Service Management of the ESN Services between the Supplier and the Other ESN Suppliers.

Service Management Processes

- 8.3.7 The Supplier shall submit a Service Management Processes document that:
- (a) sets out how the Supplier will carry out all of the ITIL-defined service management functions; and
 - (b) defines the interfaces and interactions at agreed touchpoints between the Supplier's Service Management activities and those of the US Supplier and Other ESN Suppliers.

Service Management System Design

- 8.3.8 The Supplier shall submit a Service Management System Design that describes:
- (a) the service management technical architecture, including any Service Management Systems which will be operated as part of the Supplier Solution;
 - (b) how the technical architecture supports the Service Management Strategy; and
 - (c) the interface to the ESN Service Management System within the context of their proposed service management technical architecture.

Service Management Organisation Plan

- 8.3.9 The Supplier shall submit a Service Management Organisation Plan that includes:
- (a) the service management organisation structure and how it relates to the operating model defined in the Service Management Strategy;

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- (b) numbers of service management personnel, including any Sub-contractors used;
- (c) the locations of service management personnel;
- (d) the plan for training and recruiting personnel with the appropriate experience, and establishing and testing the service management organisation; and
- (e) key service management personnel.

Service Portfolio

8.3.10 The Supplier shall ensure that the Service Portfolio includes:

- (a) the Service Catalogue for the Services, including fulfilment times for Service Requests;
- (b) services provided by Sub-contractors;
- (c) a roadmap for the Services; and
- (d) retired services.

Availability Plan

8.3.11 The Supplier shall submit an Availability Plan which:

- (a) identifies elements of the Services that will be managed to ensure availability;
- (b) analyses the impact of failure on agreed elements;
- (c) set outs the approach to monitoring, measurement, analysis and resolution of availability issues; and
- (d) set outs how the Supplier will ensure availability of the agreed elements.

Capacity Plan

8.3.12 The Supplier shall provide a Capacity Plan which:

- (a) identifies elements of the Services that will be managed to ensure sufficient Capacity is available;
- (b) analyses the impact of changes in demand on agreed elements;
- (c) sets out the approach to monitoring, measurement, analysis and resolution of Capacity issues; and
- (d) demonstrates how the Supplier will respond to variations in demand for the Services.

Operational Change Management Policy

8.3.13 The Supplier shall submit an Operational Change Management Policy which sets out the Supplier's policy relating to the planning, management and implementation of changes, including:

- (a) the Operational Changes process for Authority or User Organisation-initiated Operational Changes and Supplier-initiated Operational Changes, including emergency Operational Changes;
- (b) the approach to prioritisation of planned Operational Changes;

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- (c) the visibility of planned Operational Changes; and
- (d) an impact assessment of Operational Changes including the risks associated with the Operational Change, the urgency, benefit, the approach to impact and cost of the Operational Change.

Knowledge Management Strategy

8.3.14 The Supplier shall submit a Knowledge Management Strategy which sets out:

- (a) the Supplier's approach to managing the information and knowledge;
- (b) how information and knowledge will be developed and updated over the term of the contract; and
- (c) how information and knowledge will be shared with the Authority and Other ESN Suppliers to ensure the efficient operation of the ESN.

Maintenance Plan

8.3.15 The Supplier shall submit, and keep up to date at all times (promptly re-submitting to the Authority after any updates), a Maintenance Plan that sets out:

- (a) the maintenance activities required for all hardware and software deployed to support the Services; and
- (b) the Maintenance Schedule for the operations and maintenance support of agreed components of the Supplier Solution, which should be submitted and kept up to date as part of the planned engineering works dataset as defined in Annex D, Paragraph D.2(e).

Continuous Improvement Plan

8.3.16 The Supplier shall submit a Continuous Improvement Plan that sets out:

- (a) improvements to business processes;
- (b) improvements to Services;
- (c) improvements to equipment deployed by the Supplier, including hardware and software; and
- (d) its contributions to the ESN Technology Roadmap, including information regarding anticipated developments in technology that have the potential to offer improvements to the Services.

Service Reviews

8.3.17 The Supplier shall attend and participate in regional service review meetings for each Transition Group (as set out in Annex A (User Organisations), organised by the US Supplier with User Organisations.

8.3.18 The Supplier shall attend and participate in regional service review meetings with each Transition Group of User Organisations on a monthly basis as a minimum.

8.3.19 The Supplier shall provide commentary on the performance on a regional basis of the Services and details and trends regarding Service Incidents and problems affecting User organisations in the relevant Transition Group.

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- 8.3.20 The Supplier shall carry out actions agreed in the meeting and provide the US Supplier with information regarding the actions agreed at least [REDACTED] prior to the scheduled date of the next regional service review meeting.
- 8.3.21 The Supplier and its Sub-contractors shall take part in a national review of the ESN Services organised by the Authority, along with Other ESN Suppliers and their Sub-contractors, every [REDACTED].
- 8.3.22 At the request of the Authority the Supplier shall organise, manage and participate in ad-hoc service review meetings to address specific issues affecting the Services, inviting specific attendees from User Organisations and Other ESN Suppliers as nominated by the Authority.
- 8.3.23 The MS Supplier's performance reports, made available at the performance reviews and archived, shall include Service specific ([REDACTED]) Network-specific metrics and their performance against the applicable service levels in the preceding service period(s) and on a rolling basis.

Release Policy

- 8.3.24 The Supplier shall submit a Release Policy that defines and details: the scope of releases covered, including software, hardware, Service Management and process releases;
- (a) the scope of releases to be managed by Other ESN Suppliers or the Authority;
 - (b) the role of the Supplier in the Release Management Process operated by Other ESN Suppliers;
 - (c) the processes, checks and milestones in making a release;
 - (d) grading of releases by risk, breadth of scope and impact;
 - (e) release numbering;
 - (f) applicable standards, approvals and certifications;
 - (g) model documentation for a release;
 - (h) responsibility within the Supplier for the control and integrity of releases;
 - (i) the approach to prioritisation of releases; and
 - (j) procedures for preventing unauthorised releases.

8.4 Testing and Maintaining the Service Management Framework

- 8.4.1 The Supplier shall, during testing, demonstrate to the Authority alignment of Service Management Systems and processes to the requirements set out in Paragraph 8.3.4.
- 8.4.2 The Supplier shall test the Service Management Framework in accordance with the Test Strategy set out in Part B, Schedule 6.2 (Testing and Assurance Procedures).
- 8.4.3 The Supplier shall maintain and update the Service Management Framework on a quarterly basis throughout the Term, and re-submit and agree the changes with the Authority in accordance with the process set out in Part B of Schedule 6.2 (Testing and Assurance Procedures).

8.5 Configuration Management Database and Asset Register

- 8.5.1 The Supplier shall develop and maintain an accurate and up-to-date Configuration Management Database (CMDB) that identifies, records and reports the configuration details of all components within the Supplier Solution, including all standard Configuration Items ("CI") and associated documentation. The CMDB shall maintain:

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- (a) versions;
 - (b) locations for the Extended Area;
 - (c) constituent components; and
 - (d) inter-relationships.
- 8.5.2 The Supplier shall make the CMDB available to the Authority online in electronic format.
- 8.5.3 The Supplier shall provide an audited list of all CIs at the request of the Authority within [REDACTED] of the request being made.
- 8.5.4 The Supplier shall provide the ESN Service Management System with the Operational Data derived from the CMDB required to support the operation of end-to-end ESN service management.
- 8.5.5 The Supplier shall develop and maintain a Register of assets used to provide the Supplier's Solution and Configuration Database as further detailed in Schedule 8.5 (Exit Management).
- 8.6 Service Incident Management**
- 8.6.1 The Supplier shall implement and operate Service Incident management for the Services.
- 8.6.2 The Supplier shall integrate and coordinate its Service Incident management process with the Service Incident management processes of the Other ESN Suppliers.
- 8.6.3 The Supplier shall prioritise all Service Incidents using the process set out in Schedule 2.2 (Performance Levels).
- 8.6.4 The Supplier shall, using the process set out in the ESN service management processes (EE000277) as set out in the Services Management Framework:
- (a) record all Service Incidents and details of the Service Incidents; and
 - (b) track all Service Incidents and update the status of Service Incidents from notification to resolution.
- 8.6.5 The Supplier shall detect and raise all Service Incidents within the agreed Service Incident notification times as set out in Schedule 2.2 (Performance Levels).
- 8.6.6 The Supplier shall resolve all Service Incidents within the agreed Service Incident resolution times as set out in Schedule 2.2 (Performance Levels).
- 8.6.7 The Supplier shall maintain an escalation process to provide support for all Service Incidents 24 hours a day, seven (7) days a week.
- 8.6.8 The Supplier shall work with the Authority and the Other ESN Suppliers to define an approach to managing Major Service Incidents and agree the:
- (a) Service Incident categories that will constitute Major Service Incidents including as a minimum all Severity One Service Incidents;
 - (b) a coordinated response to Major Service Incidents; and
 - (c) any collaborative tools required to support Major Service Incidents.
- 8.6.9 The Supplier shall appoint a Major Service Incident Manager to co-ordinate responses to Major Service Incidents related to the Services.

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- 8.6.10 The Supplier shall work with the Authority and Other ESN Suppliers to diagnose and resolve Major Service Incidents.
- 8.6.11 The Supplier shall provide a Service Incident review of all Major Service Incidents, and for other Service Incidents at the request of the Authority, within [REDACTED] of the resolution of the Service Incident or the request made by the Authority. Extensions to the [REDACTED] limit may be agreed with the Authority where there are extenuating circumstances. The Service Incident review shall include:
- (a) an examination of the cause of the Service Incident and response to the Service Incident;
 - (b) identification of strengths and weaknesses in the response;
 - (c) recommendations for prevention, mitigation and improvement of response to Service Incidents; and
 - (d) Recommendations for remedial actions and improvements to the Service.
- 8.6.12 The Supplier shall carry out root cause analysis of all Major Service Incidents as part of the Service Incident review.
- 8.6.13 The Supplier shall carry out on an ad-hoc basis root cause analysis of an average of [REDACTED] Service Incidents per month over a rolling [REDACTED] period, with no more than [REDACTED] in a single month, at the request of the Authority.

8.7 Problem Management

- 8.7.1 The Supplier shall implement and operate problem management for the Services.
- 8.7.2 The Supplier shall undertake problem management related to a Service Incident at the request of the Authority.
- 8.7.3 The Supplier shall:
- (a) monitor potential service degradation;
 - (b) proactively analyse Service Incidents to identify common underlying root causes;
 - (c) receive, identify, classify and record problems;
 - (d) investigate and diagnose root causes; and
 - (e) propose workarounds and remediations to identified root causes.
- 8.7.4 The Supplier shall agree with the Authority additional triggers for the Supplier to undertake problem management as part of the Service Management Framework.
- 8.7.5 The Supplier shall integrate and coordinate its problem management systems and processes with those of the Authority and Other ESN Suppliers.
- 8.7.6 The Supplier shall work with Other ESN Suppliers to resolve problems that affect the end-to-end ESN Service.
- 8.7.7 The Supplier shall provide knowledge regarding the Services and personnel to support Resolution of problems managed by the Authority at the request of the Authority.

Known Error Database

- 8.7.8 The Supplier shall maintain a Known Error Database ("KEDB") including known errors, faults and workarounds relating to the Services.

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- 8.7.9 The Supplier shall provide updates regarding problems to the Authority and Other ESN Suppliers in accordance with the ESN service management processes (EE000277).
- 8.7.10 The Supplier shall provide the Authority the Other ESN Suppliers with access to the Supplier's KEDB via the ESN Service Management System.
- 8.7.11 The Supplier shall provide updates to the Authority and to Other ESN Suppliers regarding active problems, errors, faults and workarounds on a weekly basis as a minimum.

8.8 Service Event Management

- 8.8.1 The Supplier shall implement and operate Service Event management process for the Services.
- 8.8.2 The Supplier shall carry out correlation of Service Events, and provide details of correlated Service Events to the Authority as part of Service Incident case information.
- 8.8.3 The Supplier shall provide alerts and warnings to the ESN Service Management System for Service Events that will affect the quality of the Services as part of Service Incident case information.
- 8.8.4 The Supplier shall raise Service Incidents, where Service Event thresholds are breached, in a timely manner in accordance with the ESN service management processes (EE000277).

8.9 Request Fulfilment

- 8.9.1 The Supplier shall implement and operate Request Fulfilment process for the Services.
- 8.9.2 The Supplier shall operate a Request Fulfilment process that includes:
- (a) logging and tracking of Service Requests made by the Authority from the Supplier's Service Catalogue;
 - (b) categorising and prioritising Service Requests according to criteria set out in the Service Management Framework;
 - (c) sourcing and delivering information or services in response to Service Requests;
 - (d) providing updates regarding resolution of Service Requests; and
 - (e) providing information about services and procedures for obtaining them.
- 8.9.3 The Supplier shall provide response updates to all Service Requests received at a frequency and using a method set out in the Service Management Framework according to the priority of the Service Request.
- 8.9.4 The Supplier shall align its Request Fulfilment process with those operated by the Authority and the Other ESN Suppliers.
- 8.10 Operational Change Management**
- 8.10.1 The Supplier shall implement and operate an Operational Change procedure for all system, operational, and technical changes and releases set out in Schedule 8.2 (Change Control Procedure).
- 8.10.2 The Supplier shall record, manage and track all Operational Changes carried out by the Supplier, including all changes to:
- (a) application software;
 - (b) communications equipment and software; and

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- (c) all documentation associated with running, support and maintenance of the Operational Service.
- 8.10.3 The Supplier shall appoint an Operational Change manager for each Operational Change to:
- (a) manage the Operational Change process;
 - (b) manage the implementation of the Operational Change; and
 - (c) monitor and report on the implementation of Operational Changes to the Authority.
- 8.10.4 The Supplier shall provide to the Authority details of all Operational Change Requests via the ESN Service Management System or otherwise as agreed by the Parties in writing.
- 8.10.5 The Supplier shall provide visibility to the Authority and the Other ESN Suppliers through the Forward Schedule of Changes of:
- (a) All Service Affecting Operational Changes after taking into account any steps to mitigate the impact of the change; and
 - (b) all non-Service Affecting Operational Changes unless agreed with the Authority.
- 8.10.6 The Supplier shall notify the Authority of any Operational Changes that may affect the Availability of the Services, including maintenance carried out on Base Stations, in accordance with the timescales set out in Paragraphs 8.6 and 8.7 of Schedule 8.2 (Change Control Procedure).
- 8.10.7 The Supplier shall ensure Operational Change Requests (other than Late Notice Operational Changes and Emergency Operational Changes) are notified to the Authority at least [REDACTED] prior to the scheduled start date of each Operational Change, and that such notifications are kept up to date from time to time.
- 8.10.8 Unless notified otherwise by the Authority as follows in this Paragraph, the Supplier shall proceed with Operational Changes as notified to the Authority on the basis of deemed consent by the Authority. The Supplier shall reschedule Operational Changes included in the Forward Schedule of Change following requests made by the Authority up to [REDACTED] to the scheduled date of the Operational Change as set out in this Paragraph 8.
- 8.10.9 The Supplier shall comply with the instructions of the Authority relating to a moratorium on Operational Changes for a specified period as set out in this Paragraph 8.
- 8.10.10 The Authority shall be entitled to [REDACTED] under which the Authority shall be entitled to require the Supplier to:
- (a) reschedule Operational Changes following requests made by the Authority within [REDACTED] of the scheduled date of the Operational Change;
 - (b) suspend or cancel and reverse Operational Changes in progress, in accordance with Schedule 8.2 (Change Control Procedure), Paragraph 14.
- 8.10.11 In the event that the Authority uses the [REDACTED] described in Paragraph 8.10.10 in any [REDACTED], the Supplier shall, at the request of the Authority:
- (a) reschedule Operational Changes following requests made by the Authority that are within [REDACTED] of the scheduled date of the Operational Change;
 - (b) suspend or cancel and reverse Operational Changes in progress; and
 - (c) provide to the Authority within [REDACTED] of the request being made an estimate of the cost of rescheduling, suspending or reversing the Operational Change,

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in accordance with Schedule 8.2 (Change Control Procedure), Paragraph 14.

8.10.12 The Supplier shall update:

- (a) all Service Management Framework and Knowledge Management documentation related to the Operational Change within [REDACTED] of the Operational Change having been completed; and
- (b) the CMDB and asset register within [REDACTED] following the completion of the Operational Change.

8.10.13 If required under Schedule 8.2 (Change Control Procedure), the Supplier shall attend the Operational Change Advisory Board for the management of Operational Changes and the Emergency Change Advisory Board for the management of Emergency Operational Changes as set out in Schedule 8.1 (Governance).

8.11 Release Management

8.11.1 The Supplier shall manage the authorisation of and deployment of releases through the Supplier's Operational Change management process.

8.11.2 From the Effective Date, the Supplier shall create and update a schedule of releases that the Supplier intends to implement during the following [REDACTED].

8.11.3 The Supplier shall make the updated release schedule available to the Authority and the Other ESN Suppliers via the US Supplier within [REDACTED] of any changes made to it.

8.11.4 The Supplier shall provide information regarding the packaging and deployment of the release to the Authority at least [REDACTED] prior to the scheduled implementation of a release.

8.11.5 The Supplier shall inform the Authority and the Other ESN Suppliers of any Operational Changes that the Authority and Other ESN Suppliers must implement that are necessary for the effective implementation and operation of the Supplier's releases at least [REDACTED] before the planned implementation date.

8.11.6 The Supplier shall define in the Release Policy and put in place systems and processes that allow for expediting emergency releases to ensure service continuity.

8.12 Knowledge Management

8.12.1 The Supplier shall implement and operate Knowledge Management for the Services.

8.12.2 The Supplier shall record and maintain knowledge, information and data relating to the Services, relevant to:

- (a) Authority staff;
- (b) User Organisation support staff; and
- (c) Other ESN Supplier staff.

8.12.3 The Supplier shall make Knowledge Management documentation and materials regarding the Services available to the Authority, User Organisations and Other ESN Suppliers via the ESN Service Management System.

8.12.4 The Supplier shall provide knowledge transfer to the service desk operated by the US Supplier to enable it to manage the service effectively and resolve the maximum number of incidents during initial triage of Service Incidents.

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- 8.12.5 The Supplier shall provide knowledge transfer to the US Services supplier to enable it to provide training support services to the Authority.
- 8.12.6 The Supplier shall maintain all Knowledge Management documentation up to date and proactively submit updates to the ESN Service Management System in accordance with the ESN service management processes (EE000277).

8.13 Business Relationship Management

- 8.13.1 The Supplier shall implement and operate business relationship management for the Services.
- 8.13.2 The Supplier shall provide a nominated business relationship manager. The business relationship manager will:
- (a) ensure the Services align with the Authority's objectives;
 - (b) provide a single point of contact for escalation of performance issues; and
 - (c) engage with Authority and Other ESN Supplier Parties as agreed with the Authority.
- 8.13.3 The Supplier shall agree any changes to the Business Relationship Management approach, and consequent changes to and handover of responsibilities, with the Authority.

8.14 Extended Area Services Site Operations**Service Management – Extended Area Services**

- 8.14.1 The Supplier shall:
- (a) provide Service Management to the EAS Sites set out in the Site list provided by the Authority, such Sites having achieved, as a minimum, the Transfer to Operations milestone;
 - (b) provide all Service Management to the EAS Site regardless of the number and nature of MNOs on the Site;
 - (c) provide the Service Management in respect of the ESN network as well as provide any of the Services where they apply to other MNOs on Site or other site sharers; and
 - (d) Where the Services detailed and agreed previously in the EAS service description cover equipment or infrastructure it shall be those items described in the EE006504 service description document (including any substitute elements as granted by a site-specific concessionary note), but excluding any equipment deployed by, or on behalf of, a site sharer.

Stakeholder Relationships

- 8.14.2 The Supplier will undertake the management of all planned maintenance activity to ensure co-ordination across the different service areas (and service providers where applicable); Stakeholder engagement and communication; delivery reporting; Incident and MIM.
- 8.14.3 Cross functional / Supplier meetings will be held to facilitate communications raise issues.

Spare Parts

- 8.14.4 Spare parts for in scope Services will be managed by the Supplier and its agents, including forward and reverse logistics, and asset management.

Consumables

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- 8.14.5 All consumables required for reactive and proactive maintenance will be supplied from stocks held in field engineers' vehicles. No consumables will be stored on site.

Recording and Doing Work

- 8.14.6 The Supplier will coordinate and manage site provider requested works, checking rights and obligations in leases.
- 8.14.7 All work whether proactive, reactive maintenance or any other activity will be undertaken only under an authorised Operational Change Request stating the dates and times in which the work shall be performed.
- 8.14.8 Work undertaken by the Supplier and its agents will be specified in a Risk Assessment and Method Statement (RAMS).
- 8.14.9 Where access to a Site is denied, whether physically or through withholding of permission, in contradiction to the rights and obligations set out within the lease, and the Service Provider has been unable to resolve this with the site provider or the landlord of the relevant Site, the matter shall be passed to the Authority for resolution.
- 8.14.10 On any site where it is deemed necessary field engineers shall be accompanied by a security escort while in attendance. The Supplier shall arrange [REDACTED] for such an escort if necessary.
- 8.14.11 All workers with a need to work at heights will have undertaken training and certification in order to do so.
- 8.14.12 Where it is deemed appropriate that lone working is undertaken the worker shall follow all procedures and provisions from their employer for this circumstance.
- 8.14.13 Changes to the Site will be reflected in the Site records within as soon as practicable. Information pertaining to risks or hazards identified on site will be updated urgently.

Scheduling Planned Work

- 8.14.14 Planned works will be scheduled in advance in accordance with the lead time defined in the Operations Manual according to whether it is a service affecting or non-service affecting site access request or request for change.
- 8.14.15 Any such plans will be assessed with consideration to their potential and actual impacts to the Network and the services being provided.
- 8.14.16 Scheduling of work will comply with the times that are specified in the lease, and will ensure conflicts with other work are avoided e.g., where planned work on the same elements at the same time, but optimise attendance at Sites to limit the number of visits where appropriate.
- 8.14.17 A forward schedule of planned works will be maintained aligned to the frequency and period specified in the Operations Manual and made available for discussion at Operational Change Advisory Boards.

Change Management

- 8.14.18 The Supplier will maintain a team responsible for the day-to-day interface for the operational change management process as set out in the Operational Change Management Policy and responsible for execution of the process 24 hours a day 7 days a week 365 days a year.
- 8.14.19 The team referred to in Paragraph 8.14.18 will manage all different change types: planned (within the standard lead time); emergency (need to be scheduled with less than the standard lead time) as defined in the Operations Manual and process requests for change through the change management system.

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- 8.14.20 Third parties requiring service from the team must be onboarded subject to the operational change management process as set out in the Operational Change Management Policy to ensure they understand change management requirements and that their changes are managed in accordance with it. SRN MNOs should raise their own changes through the process. Where another third party is unable to raise the change in accordance with the defined process, the Supplier to raise the change on behalf of the third party.
- 8.14.21 Where notified by the Authority, or authorised representatives, the team will impose change restrictions and policy variations including adapting or cancelling permits that have already been issued as necessary in line with Paragraph 8.10.
- 8.14.22 At the conclusion of the planned activity the team will confirm that any impacts to the normal operation of the Site have ceased.
- 8.14.23 The team will log an incident where any work exceeds the change window specified in its permit, and will manage accordingly, detailing any impact to service and the work required to be undertaken to rectify the impact.

Impact Assessment

- 8.14.24 The Supplier will assess all requests for Operational Changes and Site access, with reference to the risk categories within the Operations Manual, to ensure that the impact of an Operational Change on all areas of the Network is considered and assess the degree of risk prior to submitting to Change Management Board.
- 8.14.25 Where there is an actual, or high risk of, impact from proposed works, these will be scheduled to minimise the impact to ESN Users.

Approval

- 8.14.26 The Supplier will receive and review change and access requests to evaluate if the request for change is complete and provides sufficient information to proceed to appropriate personnel for approval.
- 8.14.27 Where a request is rejected, the originator will be notified in good time.

Review

- 8.14.28 The Supplier will monitor that changes made are within the scope and timescales granted under its permits, and where there is a variance raise an incident or contribute to service reviews as appropriate.
- 8.14.29 The requestor will close the changes on the Change Management system within [REDACTED] of implementation end date, indicating the outcome.
- 8.14.30 The Supplier will review all failed planned works, capturing lessons learned to inform future works.

Incident Management Requiring Field Resources

- 8.14.31 The Supplier will check the access protocols for the Site and carry out advance arrangements or notifications as required.
- 8.14.32 The Supplier will record access details and any identified health and safety risks and these are supplied in the ticket passed to the Field Resource or other third party.
- 8.14.33 Spare parts for Field Resource will be supplied in advance wherever possible to reduce wait times in the field, and the location or delivery details passed to the Field Resource as appropriate.
- 8.14.34 The Supplier will provide a point of contact for the Field Resource at all times whilst on Site.

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Site Acceptance

8.14.35 The Supplier will audit that the Site is built as per Site design documentation and that Site database records are accurate including any access and health and safety requirements.

8.14.36 The Supplier will liaise with build/deployment function / supplier to review any design deviations on a Site.

8.14.37 The Supplier will perform a site quality audit on newly built Sites, or Sites coming into Supplier's custody for the first time, as a result of build programme or transfer of Sites to the Authority.

8.14.38 Supplier will provide a service management function to act as a single point of contact for the Authority, its third parties and other stakeholders.

8.14.39 The service management function should as a minimum:

- (a) be based on an ITIL structure and processes;
- (b) collaborate and co-operate with the service management functions of the MS Supplier, US Supplier and other third parties;
- (c) provide a seamless site acceptance service for System Users;
- (d) provide an Integrator relationship;
- (e) be for use of systems, etc;
- (f) provide a service desk acting as a single point of contact 24 hours a day, 7 days a week, 365 days a year, for reporting of Service Incidents and Service Requests and liaising with US Supplier, site facility providers [REDACTED] including ticketing;
- (g) provide management of Site fault alarms including EAS Site alarm/event integration of all active and passive non-EE supplier EAS Site equipment alarms and events (cabin door open, high temperature, AC power, diesel generator set related etc);
- (h) provide alarm/event monitoring and problem management;
- (i) manage Site fault alarms;
- (j) provide Service Incident and Service Request, and event management – integration of EAS Sites within existing MS Supplier Primary Area Service Management processes including triaging and co-ordination of activities to resolution with associated service level reporting, escalation and major incident management;
- (k) provide co-ordination of activities/process with services & integration requests;
- (l) provide configuration & asset management;
- (m) provide tasking & co-ordination of field activities with 3rd party suppliers;
- (n) provide tasking facilities management organisation for Site related issues;
- (o) provide co-ordination & deployment of temporary site power requests;
- (p) provide co-ordination & deployment of temporary sites for continuation of EAS service; and
- (q) provide reporting, including performance reporting of incidents and events, and associated performance indicators for response and fix times.

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- 8.14.40 Service Management and service desk services will continue to apply during the decommissioning, transition, and re-commissioning of an EAS Site where an NTQ has been received.

9 Management Reporting and Auditing

9.1 Data Capture

Operational Data

- 9.1.1 The Supplier shall record, manage, maintain and provide to the US Supplier Event Logs and Operational Data as set out in Annex D (Data Capture and Reporting Specification), for the purposes of Service Management, Operational Service Reporting, and audit and investigation.
- 9.1.2 The Supplier shall record the following Operational Data, as set out in Annex D (Data Capture and Reporting Specification).

Event Logs

- 9.1.3 The Supplier shall record the Event Logs set out in Annex D (Data Capture and Reporting Specification).
- 9.1.4 The Supplier shall ensure that access to Event Logs is itself recorded within the Event Log.
- 9.1.5 The Supplier shall ensure that Event Logs cannot be modified in any way by any ESN User or System User.
- 9.1.6 The Supplier shall ensure that Event Logs cannot be deleted by any ESN User or System User.
- 9.1.7 The Supplier shall ensure that the Supplier Solution records any changes made to the parameters concerning the recorded actions of ESN Users or System Users as part of Event Logs.
- 9.1.8 The Supplier shall ensure that access to Event Logs is strictly controlled according to ESN Users' or System Users' permissions, and within the Supplier's organisation and its Sub-contractors to those individuals that require access to perform their duties; any breaches shall be treated as a Breach of Security (and the provisions of Schedule 2.4 (Security Management) shall apply).
- 9.1.9 The Supplier shall ensure that Event Logs and the information derived from them is conformant with the BS 10008:2008 'Evidential weight and legal admissibility of electronic information' specification.
- 9.1.10 The Supplier shall ensure that Event Logs and the information derived from them is conformant with the 'ISO/CD 15489-1 for Records Management Best Practice' specification.
- 9.1.11 The Supplier shall provide data to the US Supplier relating to Security incidents as set out in Annex D (Data Capture and Reporting Specification).

9.2 Data Retention, Access and Availability

- 9.2.1 The Supplier shall ensure that all recorded Event Logs and Operational Data is retained for the Term.
- 9.2.2 The Supplier shall retain and make recorded Event Logs and Operational Data available to the Authority on request and within [REDACTED].
- 9.2.3 The Supplier shall ensure that all Event Logs and Operational Data recorded in the last [REDACTED] is available via the US Supplier Solution and on request of the Authority from the Supplier directly within [REDACTED].
- 9.2.4 The Supplier shall provide each User Organisation with access to all of the User Organisation's Event Logs and Operational Data that has been archived within a [REDACTED] period upon request (if the Authority agrees archiving is necessary).

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- 9.2.5 The Supplier shall ensure that all recorded Event Logs and Operational Data is available for secure transfer to the Authority (or to another party as directed by the Authority) at the end of the Term.
- 9.2.6 The Supplier shall securely destroy all recorded Event Logs and Operational Data under the Supplier's control following the successful secure transfer of that data to the Authority (or other third party as directed by the Authority) at the end of the Term.
- 9.2.7 The Supplier shall ensure the Integrity of all recorded Event Logs and Operational Data for the Term.
- 9.2.8 The Supplier shall ensure the confidentiality of all recorded Event Logs and Operational Data for the Term, in accordance with Schedule 2.4 (Security Management).
- 9.2.9 The Supplier shall ensure the currency and accuracy of all recorded Event Logs and Operational Data for the Term.
- 9.2.10 The Supplier shall ensure that metadata is accurately captured and maintained throughout the lifecycle of the data for each dataset (N.B. the datasets are set out in Annex D (Data Capture and Reporting Specification)).
- 9.2.11 The Supplier shall ensure that aggregation of raw data into summary statistics for reporting and Record purposes, is consistent and does not mislead interpretation. Known errors, omissions or data corruption instances must be clearly stated.

9.3 Data for Reporting

- 9.3.1 The Supplier shall provide data (or access to data) to the US Supplier to enable Operational Service Reports as set out in Annex D (Data Capture and Reporting Specification).
- 9.3.2 The Supplier shall ensure that the Supplier Solution automatically provides Event Logs and Operational Data to the US Supplier on an ongoing basis via an interface defined and implemented by the US Supplier.
- 9.3.3 The Supplier shall use the interface provided by the Supplier pursuant to Paragraph 6.4.22 (as defined and implemented by the US Supplier) to provide Event Logs and Operational Data to the US Supplier, in accordance with the Interface Control Document provided by the US Supplier.

Requirements Traceability Matrix

- 9.3.4 The Supplier will produce evidence that the Authority Requirements are met in a Requirements Traceability Matrix (RTM) that is maintained and provided to the Authority.
- 9.3.5 The Supplier shall provide the Requirements Traceability Matrix to the Authority as a file in .csv format. The file shall follow the RTM template EE000290 provided by Authority.
 - (a) Where the format is updated by the Authority, the Supplier will be informed and engaged as the need for change arises and given not less than [REDACTED] notice in advance of any required change.
 - (b) No alternative or supplementary formats will be accepted without the express permission of the Authority.
 - (c) The Authority reserves the right to amend and update this template at the discretion of the Authority.
- 9.3.6 The Supplier shall submit the RTM to the Authority monthly, shall maintain it throughout the Term and [REDACTED]
- 9.3.7 The RTM shall include the following information:

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- (a) traceability from the Authority Requirements to design artefacts and technical specifications which describe how the requirement is to be implemented;
 - (b) traceability from the Authority Requirements to test cases which describe how the requirement is to be verified; and
 - (c) the key or integration milestone(s) relevant to when the requirement will be met.
- 9.3.8 The Authority may request a copy of any or all documentary evidence used to verify the requirements included in the RTM from time to time. [REDACTED]

9.4 Coverage Reporting

- 9.4.1 The Supplier shall provide the US Supplier with predictions of Coverage as set out in Annex D (Data Capture and Reporting Specification) for all Coverage originating from Base Stations and from the MS Supplier Radio Equipment on Radio Sites, in accordance with an Interface Control Document for the Coverage Information Interface provided by the US Supplier. The Supplier shall provide input into and shall agree the Interface Control Document.
- 9.4.2 Not used.
- 9.4.3 Not used.
- 9.4.4 The Supplier shall provide, to the Authority, separate predictions of Coverage for each individual Base Station in the Primary Area and the Extended Area and for each sector of each Base Station.
- 9.4.5 The Supplier shall provide, to the Authority, a separate spatial dataset that records the results of all actual Coverage measurements available to the Supplier that establish or verify the extent of Coverage.
- 9.4.6 The Supplier shall provide a separate spatial dataset that identifies sections of road that the predictions indicate will not meet the Authority's Vehicle Coverage specification as set out in Paragraph 3.2.
- 9.4.7 The Supplier shall, [REDACTED] provide the Authority with predictions of Coverage that show each phase in the rollout of MS Supplier provided Base Stations and the corresponding effect on predicted Coverage.
- 9.4.8 In accordance with processes set out in Schedule 6.3 (Coverage Benchmarking and Validation Process), the Supplier shall, [REDACTED] throughout the Term provide updates to the predictions of Coverage identifying the current predicted Coverage, and ensuring that it is clear how the Coverage prediction has changed since the last time predictions were provided.
- 9.4.9 The Supplier shall provide interim monthly updates to its predictions of Coverage where [REDACTED] or more Sites have been put into live service.
- 9.4.10 The Supplier shall inform the Authority of any non-permanent Coverage Enhancements of the same technology of that used by the Supplier Solution, provided for Other Customers. [REDACTED]
- 9.4.11 The Supplier shall provide to the Authority on a rolling monthly basis a list of all such compatible enhancements, and shall inform the Authority of any changes to the list within [REDACTED] of the changes being decided upon by the Supplier.
- 9.4.12 The Supplier shall provide a Coverage prediction for each enhancement. For example this could include Coverage being provided to cover a Planned Event such as a music festival.
- 9.4.13 The Supplier shall provide the Authority with clear written guidance on the interpretation of the predictions of Coverage. This should, without limitation, include an explanation for each parameter

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used in the calculation of the link budgets, the relative reference points for measurement, the device characteristics used for the prediction and the percentage probability of coverage expected to be obtained at each location.

- 9.4.14 The Supplier shall, [REDACTED] submit to the Authority its current predictions of Coverage.
- 9.4.15 The predictions of Paragraph 9.4.14 will be for the Base Stations that make up the Mobile Network and shall be based on a small number of models which have been tuned for different propagation environments by an appropriate number of measurements. [REDACTED]
- 9.4.16 The Supplier shall provide predictions of Coverage to the Authority for the entire area of Great Britain and sufficient of the territorial waters to display all Coverage provided in the territorial waters, including that Coverage provided from Radio Sites.
- 9.4.17 The Supplier shall provide the US Supplier with predictions of Coverage for all Coverage originating from Base Stations and from the MS Supplier Radio Equipment on Radio Sites, in accordance with an Interface Control Document provided by the US Supplier. The Supplier shall provide input into and shall agree the Interface Control Document with the Authority.

9.5 Spatial Dataset Sources and Format

- 9.5.1 The Supplier shall produce and submit to the Authority all Coverage spatial datasets that are:
- (a) in an open format (either vector or raster, whichever more appropriately represents the data), capable of further analysis and manipulation in a GIS as defined in Schedule 2.3 (Standards);
 - (b) are readily accessible by GIS products, including MapInfoTM and Esri ArcGISTM programs, as current four years before the Effective Date, and all subsequent versions, unless otherwise agreed with the Authority; and
 - (c) accompanied by their corresponding metadata files;
 - (i) named to clearly define the date the Coverage predictions relate to;
 - (ii) named to clearly identify whether Coverage is based on predicted or actual measurements;
 - (iii) complete with no attribute information missing;
 - (iv) compliant with industry best practice on GIS data quality standards; and
 - (v) based on the OS British National Grid as the reference system.
- 9.5.2 The Supplier shall sign the PSMA Contractor Licences Agreement (“**PSMA License**”) enabling the use of the Spatial Datasets covered by the Public Sector Mapping Agreement for England and Wales and the One Scotland Mapping Agreement for Scotland.
- 9.5.3 The Supplier shall provide to the Authority, from authoritative sources, all necessary data, including Spatial Datasets, that fall outside of the Public Sector Mapping Agreement and the One Scotland Mapping Agreement, and shall ensure that no limitations are agreed with the data suppliers that would unreasonably limit the Authority's use of Deliverables under the Agreement.
- 9.5.4 The Supplier shall provide the Authority and the US Supplier with the right to use of all predictions of Coverage and associated information that the Supplier provides to the Authority, for all purposes related to the Supplier Solution and its successors, with no limitations that would unreasonably limit the Authority's use of the predictions of Coverage. These rights shall be for all formats including maps and Spatial Datasets.

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- 9.5.5 The Supplier shall ensure that the Authority and the US Supplier are entitled to provide the predictions of Coverage and associated information, that the Supplier produces, to other suppliers and to User Organisations, for their use, [REDACTED]. This entitlement shall be for all formats including maps and Spatial Datasets.

Coverage Maps

- 9.5.6 The Supplier shall produce the predictions of Coverage, to be submitted to the Authority, using a resolution of 100m by 100m squares or better, unless otherwise required as specified in Paragraphs 9.5.7 to 9.5.8.
- 9.5.7 The Supplier shall carry out radio planning and produce the predictions of Coverage, to be provided to the Authority, using the higher resolution of 50m by 50m (which should be capable of aggregation into 100m by 100m squares where the Authority wishes to do so) for all locations where the 100m by 100m resolution does not predict the Coverage realistically.
- 9.5.8 The Supplier shall adopt a finer resolution than 50m by 50m where such a resolution is necessary to prepare representative predictions.
- 9.5.9 The Supplier shall, adopting widely used units of measurement that are appropriate to the radio technology of the Supplier Solution, provide the Authority with the field strength and signal quality at 1.4m above the ground or water as would be received by an isotropic antenna, predicted to be provided by the Supplier Solution, for each 100m x 100m square (or finer resolution as specified in Paragraphs 9.5.7 to 9.5.8) for the predicated best serving Base Station and the next strongest signals above the noise floor up to a maximum of 10.

10 Document Management

10.1 Document Control of Documentary Deliverables

- 10.1.1 The Supplier shall use the Electronic Document Management System ("EDMS") provided by the Authority, to submit all Documentary Deliverables, in accordance with the assurance process set out in Part A of Schedule 6.2 (Testing and Assurance Procedures).
- 10.1.2 The Supplier shall, unless otherwise stated, submit Documentary Deliverables in line with the Milestones set out in Schedule 6.1 (Implementation Plan) and in accordance with the review and assurance procedures set out in Part A of Schedule 6.2 (Testing and Assurance Procedures).
- 10.1.3 The Supplier shall submit a schedule of Documentary Deliverables, ("the Documentary Deliverables Schedule"), on a monthly basis, in accordance with Schedule 6.1 (Implementation Plan), to inform the Authority of all the submissions it intends to make and when they are planned to be submitted within a Milestone period, in accordance with the Supplier's Implementation Plan as specified in Schedule 6.1 (Implementation Plan).
- 10.1.4 The Supplier shall update the Documentation within the Authority's EDMS at weekly intervals or whenever more than 10 document entries are out of date, whichever occurs first.
- 10.1.5 The Supplier shall use the Authority's EDMS as the authoritative source for all Documentation.
- 10.1.6 The Supplier shall make clear whether a submission is not contractual meaning it will not be subject to the assurance review procedures set out in Part B of Schedule 6.2 (Testing and Assurance Procedures) but will be filed within the EDMS as "For Information Only."

10.2 Standards for Submissions of Documentary Deliverables

- 10.2.1 The Supplier shall adopt and apply the Authority Document Control Procedures, which shall be developed and updated throughout the term (including document templates where provided), to ensure a consistent approach across ESN Suppliers, including:

- (a) file naming and referencing;

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- (b) submission procedures;
 - (c) assurance review procedures outlined in Part B of Schedule 6.2 (Testing and Assurance Procedures); and
 - (d) Metadata and version control procedures, including adherence to Annex B (Metadata Requirements).
- 10.2.2 The Supplier shall retain the original electronic files submissions, but ensure that the version uploaded to the EDMS is the definitive record until such time as it is released back to the Supplier for updating. All submissions will follow the review assurance procedures of the Authority, outlined in Part B of Schedule 6.2 (Testing and Assurance Procedures). A copy of the marked up file and any related comments from the Authority or Other ESN Suppliers, shall be issued back to the Supplier via the EDMS, together with the following submission notations:
- (a) Approved: The Supplier may proceed to use the approved submission as the definitive record and incorporate product(s) or implement work covered by the submission;
 - (b) Approved with notations: The Supplier may incorporate product(s) or implement work covered by the submission, in accordance with the Authority's notations; and
 - (c) Rejected: The Supplier may not incorporate product(s) or implement work covered by the submission for the reasons indicated and shall be required to resubmit the Documentary Deliverable. The Supplier corrects the submission and resubmits in accordance with Part A of Schedule 6.2 (Testing and Assurance Procedures).
- 10.2.3 The Supplier shall provide submissions to meet the Assurance Criteria set out in each document's Documentary Product Description, as detailed in Part B of Schedule 6.2 (Testing and Assurance Procedures) to obtain approval of a deliverable with no more than one re-submission.
- 10.2.4 The Supplier shall ensure the publication of Documentation in appropriate working file formats that are:
- (a) fully compatible with Microsoft Office 2007 (and later versions); or
 - (b) any other specialist format such as CAD, GIS or other, to be specified and agreed with the Authority except where specified in the requirements.
- 10.2.5 The Supplier shall ensure that each submission, unless otherwise agreed, is made in electronic format as follows:
- (a) use the latest version of Adobe Acrobat Portable Document Format (PDF) available at the time of execution of the Contract. Electronic files which contain more than 10 pages in Adobe Acrobat format shall contain internal book-marking from an index page to major sections of the document. PDF files shall be set to open "Bookmarks and Page" view and must remain open for review and commenting;
 - (b) where necessary, the original format shall be submitted alongside the PDF file, to allow editing or interrogation of the information;
 - (c) all final and as-built Documentation is published in PDF file formats (in addition to publication in appropriate working file formats);
 - (d) shall include all the relevant metadata and document control information, in accordance with Annex B (Metadata Requirements);
 - (e) each submission shall also include a Submission Form detailing all the individual documents being submitted and the milestone they relate to;

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- (f) unless the deliverables are of a special format that required packaging into a zip archive, (e.g. CAD or GIS), all Documentary Deliverables shall be uploaded to the EDMS as separate files; and
 - (g) the PDF files shall be set up to print legibly at A0, A1, A2, A3 and A4 scale, as required.
- 10.2.6 The Supplier shall produce all Documentation in both English and Welsh where required by the Welsh Language Act 1993.

11 Billing Services

11.1 Communication Data Records

- 11.1.1 The Supplier shall provide billing services to the Authority.
- 11.1.2 The Supplier shall produce batch files daily of rated and mediated Communication Data Records ("Communication Data Records Batch Files"). These batch files shall be made available to a secure collection point agreed between the Supplier and US Supplier. The Supplier shall do this in accordance with the timescales set out in Schedule 2.2 (Performance Levels).
- 11.1.3 The Supplier shall provide Communication Data Records, as set out in Annex D (Data Capture and Reporting Specification).
- 11.1.4 The Supplier shall ensure that Communication Data Records Batch Files incorporate an ability to verify the file integrity of the data against data transfer corruption or manipulation.
- 11.1.5 The Supplier shall enable Communication Data Records Batch Files to be pulled by the US Supplier from the Supplier via secure encrypted means (e.g. IPsec or sFTP).
- 11.1.6 All Communication Data Records Batch Files shall be kept available for pulling for [REDACTED] by the Supplier after a successful pull attempt from the US Supplier Solution before removal from their systems in case of a need to re-attempt by the US Supplier.
- 11.1.7 The Supplier shall agree with the Authority the approach to identifying any anomalous usage patterns associated with the ESN Services.
- 11.1.8 The Supplier shall identify any anomalous usage patterns associated with the ESN Services and alert the Authority and the US Supplier in the Service Event of any anomalous usage patterns.
- 11.1.9 The Supplier shall provide fraud monitoring services to the Authority at a network/aggregate level to ensure no loss of revenue occurs.
- 11.1.10 The Supplier shall enable the classes of Active Connection set out in Schedule 7.1 (Charges and Invoicing), Annex 1 Table 2 to be billed in accordance with Schedule 7.1 (Charges and Invoicing).
- 11.1.11 The Supplier shall update a User's Active Connection, as set out in Schedule 7.1 (Charges and Invoicing) Annex 1 Table 2, whenever a request is received by the US Supplier Solution. The change shall be automatic and shall be reflected in the Communication Data Records as well as in invoices provided by the Supplier.

11.2 Billing Operations Manual

- 11.2.1 The Supplier shall provide its key requirements and participate in any billing and payment workshops to agree with the US Supplier and the Authority a Billing Operations Manual which includes all aspects of the provision of billing information, revenue assurance and payment and collection including all processes and procedures including Management Information provision including as necessary any escalation policies in regards to aged debt or payment disputes as set out in Schedule 6.1 (Implementation Plan).

12 Optional Services

12.1 Provision of Enhanced Coverage

12.1.1 The Supplier shall provide the capability to respond to requests by the Authority or a User Organisation to provide the need for Enhanced Coverage into areas where there is no Coverage, to allow Planned Events, Spontaneous Events and general Operational Duties to operate successfully. The Supplier shall be expected to respond in one of a number of possible ways to mitigate this gap in Coverage, including:

- (a) undertake Permanent Coverage Enhancements that provide or enable equivalent performance to the rest of the Supplier Solution, as described in Paragraph 12.2;
- (b) undertake the necessary work to allow for ESN User-deployed Permanent Coverage Enhancements as detailed in Paragraph 12.3;
- (c) provide Non-permanent Coverage Enhancements as detailed in Paragraph 12.4;
- (d) undertake the necessary work to allow for ESN User-deployed Non-Permanent Coverage Enhancements as detailed in Paragraph 12.5;
- (e) provide Gateways Devices to deliver the services detailed in Paragraph 12.6;
- (f) provide an Emergency Vehicle Coverage Solution as detailed in Paragraph 12.7; and
- (g) produce and maintain the Optional Services Catalogue as further detailed in Paragraph 15.

12.2 Permanent Coverage Enhancements — Installed by Supplier

12.2.1 From time to time, the Supplier shall be required to bar Other Customers' access to a Permanent Coverage Enhancement on notice provided at the discretion of the Authority. The Supplier shall promptly comply with any such notices.

12.2.2 The Supplier shall ensure that the locations of any Permanent Coverage Enhancements that are restricted to use by ESN Users only, do not appear in any Ofcom publicly accessible databases, in so far as is legally permissible.

12.2.3 The Supplier shall ensure that where Permanent Coverage Enhancements are of a compatible technology to the device being used by a member of the general public in order to ensure the member of the general public is able to make calls to Emergency Telephone Numbers.

12.2.4 Where, during the Term, the Supplier improves its Coverage for Other Customers such that a Permanent Coverage Enhancement is not adding materially to the Coverage, the Authority shall be entitled to withdraw from the enhancement, without penalty or further payment.

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12.3 Permanent Coverage Enhancements - Installed by User Organisation

- 12.3.1 The Supplier shall provide an Optional Service to supply Permanent Coverage Enhancements that can be installed by User Organisations and can be accessed by any User Devices, including both Handheld User Devices and Vehicle User Devices.

12.4 Non-Permanent Coverage Enhancements — Installed by Supplier

- 12.4.1 In a small number of cases the Supplier shall be required to bar Other Customers access to a Non-permanent Coverage Enhancement on notice provided at the discretion of the Authority. The Supplier shall promptly comply with any such notices.
- 12.4.2 The Supplier's implementation of Non-permanent Coverage Enhancements shall function seamlessly with each other and with the rest of the Supplier Solution such that all aspects of the Services are within the requirement and performance specifications in Schedule 2.1 (Services Description), notably including Paragraph 5.3.9 and Schedule 2.2 (Performance Levels).

12.5 Non-Permanent Coverage Enhancements — Installed by User Organisation

- 12.5.1 The Supplier shall provide an Optional Service to supply Non-Permanent Coverage Enhancements that can be installed by User Organisations and can be accessed by any User Devices.

12.6 Gateway Device

- 12.6.1 The Supplier shall from the later of [REDACTED] agree with the Authority the high level requirements for Gateway Devices that provide local radio service to User Devices, sufficient for the Supplier to undertake a solution viability assessment for Gateway Devices, as described further below. These Gateway Devices' high level requirements shall be available in two variants (each as described in the remainder of this Paragraph 12.6):

- (a) One variant to provide extended mode only:
 - (i) when the Gateway Device is connected to the Mobile Network Gateway solution via MS Supplier Coverage or other means, allowing connectivity to both ESN and telephony services for User Devices; and optionally
- (b) A second variant to provide extended mode as set out in Paragraph 12.6.1(a) above and standalone mode:
 - (i) when the Gateway Device cannot connect to the Mobile Network and Gateway Solution as no MS Supplier Coverage or other backhaul is available, the Gateway Device provides an autonomous standalone Public Safety Communications Service capability.
 - (ii) following the delivery of the respective Gateway Device high level requirements, the Authority shall be entitled, at its sole discretion exercisable in writing to the Supplier, to require the Supplier to provide detailed specifications and an assessment of commercial and technical viability for each of the relevant Gateway Device variants as described above, meeting the high-level requirements and additionally including any use cases and additional requirements notified by the Authority.

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- (iii) the detailed specifications and the commercial and technical viability assessment shall in each case be sufficient to allow the Authority to determine whether it shall require the Supplier to add the Gateway Devices to the Optional Services Catalogue. If the Authority does require the Gateway Devices to be added to the Optional Services Catalogue, the Supplier shall ensure that they are available as Optional Services as soon as is reasonably practical.
- (iv) if the Supplier determines that a technically or commercially viable Gateway Device does not exist, or if the Authority's decision is not to proceed with the Gateway Solution and/or Devices, then the Authority shall work with User Organisation's and the Supplier to agree next steps, and the requirements for the Gateway Device may be subject to change via the Change Control Procedure.

12.6.2 The Supplier shall ensure that both of the Gateway Device variants have the capability to:

- (a) [REDACTED]
- (b) [REDACTED]
- (c) [REDACTED]
- (d) [REDACTED]
- (e) [REDACTED]
- (f) [REDACTED]

12.6.3 When operating in extended mode Gateway Devices shall be designed to:

- (a) [REDACTED]
- (b) [REDACTED]
- (c) [REDACTED]

12.6.4 The Supplier's specification shall enable the Gateway Device, when operating in standalone mode to operate a simple Public Safety Communications Service application. This shall enable User Devices, with the appropriate User Client application installed, to communicate with ESN Users operating within the standalone coverage extension using, as a minimum, Group Calls. The Supplier Gateway Device specification shall include both applications.

12.6.5 The Supplier's Gateway Devices shall be specified to, as a continuing process that can accommodate the arrival and departure of active Gateway Devices, maintain their functionality when multiple Gateway Devices congregate in close proximity, such that the Coverage being provided, overlaps.

12.6.6 The Supplier's Gateway Devices specification shall provide for a local control interface that enables an ESN User to manually configure the Gateway Device operation.

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12.6.7

[REDACTED]

12.6.8 The Supplier shall ensure that the Gateway Devices are specified to be suitable for permanent installation in common User Organisation Vehicles and be similar in size and weight to an existing mobile radio transceiver (e.g., TETRA), or otherwise sufficient to meet the Authority use case requirements which will be provided prior to detailed design.

12.6.9

[REDACTED]

12.6.10 The Supplier Gateway Devices shall be specified to support an Ethernet connection which enables a User Device, connected via the Ethernet connection, to access the Mobile Communications Services and US Supplier Services.

12.6.11 The Supplier shall provide the Authority with any Gateway Devices ordered pursuant to the option described in Paragraph 12.6.1, and provide the Authority with a record of Gateway Devices as supplied under this Agreement which are to be used for the provision of the Services, which shall be included at Annex 2 and 3 of (Schedule 8.5 (Exit Management) (which lists shall be maintained throughout the Term by the Supplier).

12.6.12

[REDACTED]

12.7 Emergency Vehicle Coverage Solution

12.7.1 The Supplier shall undertake a technical impact assessment to determine the technical feasibility of an Emergency Vehicle Coverage Solution, in line with the requirements set out in Paragraphs 12.7.2 to 12.7.4. The output of the technical impact assessment shall be reviewed by both Parties. If the Supplier determines that a technically viable Emergency Vehicle Coverage Solution exists and meets the Authority's requirements set out in Paragraphs 12.7.2 to 12.7.4, then the Supplier shall include the solution within the Optional Services Catalogue, for the Authority to call-off as and when required.

12.7.2 The Supplier shall provide an Emergency Vehicle Coverage Solution which shall be suitable for installation in, or transported by, a limited number of User Organisations' Vehicles or trailers that are used as mobile emergency control centres.

12.7.3 The Supplier shall ensure that the Emergency Vehicle Coverage Solution is functionally equivalent to a Mobile Base Station but may be restricted in performance to be compatible with the rest of the Supplier Solution, whilst providing significantly higher capability than the Gateway Device.

12.7.4 The Supplier's implementation of the Emergency Vehicle Coverage Solution shall be compatible with the operation of the Supplier's implementation of the Gateway Device.

13 Coverage Enhancement Locations

13.1 Coverage Enhancement Location surveys

13.1.1 The Supplier shall work collaboratively with the Authority and User Organisations to survey Coverage at locations detailed in the Coverage Enhancement Locations list to be provided by the Authority.

13.1.2 The Supplier shall be required to undertake Coverage surveys at a minimum of [REDACTED] Coverage Enhancement Locations, which shall be notified by the Authority to the Supplier in writing. Coverage surveys shall include a Coverage solution recommendation.

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- 13.1.3 The Supplier shall use the Handheld User Device reference characteristics specified in Annex G (User Device Reference Configurations) and ensure these parameters are factored in to achieve the required Handheld Coverage.
- 13.1.4 The Supplier shall ensure that Handheld User Devices shall achieve [REDACTED] of obtaining access to Mobile Communication Services at the Minimum Data Rates as well as the agreed MOS criteria as set out in Paragraph 3.1.7.(c) and as per the process outlined in Paragraph 8 of Schedule 6.3 (Coverage Benchmarking and Validation Process).
- 13.1.5 If the survey shows that Coverage is not available, the Supplier shall install a solution to fix a defined gap to meet Authority requirements in a cost-effective manner, unless the Authority has notified the Supplier to not proceed with the Site within [REDACTED] of being notified of the lack of Coverage by the Supplier. Should the Authority advise the Supplier that a Coverage solution is not required at a Site, that Site shall be removed from the Supplier's Coverage obligation and replaced with another Site.
- 13.2 Deployment of Coverage Enhancement Locations**
- 13.2.1 The Supplier shall be required to provide Coverage [REDACTED].
- 13.2.2 All Coverage Enhancement Locations where a solution is installed will be listed in Annex J of this Schedule 2.1 which will be populated using the Change Control Procedure at the time of rebaselining [REDACTED] following the Effective Date, as described in Schedule 7.1 (Charges and Invoicing) and Schedule 8.2 (Change Control Procedure) and updated at [REDACTED] intervals thereafter.
- 13.2.3 The Authority shall have the right to terminate on a site-by-site basis, by providing [REDACTED] written notice to terminate such Site. Where the Authority invokes such termination right, they shall be liable for all costs associated with the termination including any abort costs. [REDACTED]
- 13.2.4 For Coverage Enhancement Locations that require an uplift in Coverage, the following high-level activities, which are not exhaustive, should form part of the process:
- (a) the Supplier shall produce a draft delivery plan within a timescale agreed with the Authority, followed by a final plan on completion of the [REDACTED];
 - (b) regular checkpoint meetings as agreed between the Authority and the MS Supplier plus ad hoc meetings as required by the Authority;
 - (c) reconciliation meetings prior to the submission of invoice and ad hoc meetings as required;
 - (d) the Supplier shall produce and make available to the Authority a tracker to report progress against the programme delivery plan;
 - (e) a Handover Pack for each Coverage Enhancement Location post testing and assurance; contents to be agreed by the Supplier and Authority, and
 - (f) the Supplier shall provide all service management, facilities management and property management services.
- 13.2.5 Coverage Enhancement Locations can be both indoor and outdoor and fixes should not discount optimisation or upgrading the macro layer for providing Handheld Coverage.
- 13.2.6 Service management and physical access requirements for each Coverage solution shall be detailed in the Handover Pack for that Coverage solution. The Supplier shall obtain the best possible service levels for each location [REDACTED]. If the Authority or an ESN User requires enhanced service levels for a site, these shall be specified as part of the Authority or ESN User requirements for that site.

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13.2.7 Annex K to this Schedule 2.1 contains a sample floor plan to demonstrate the level of detail which the Authority expects to provide to the Supplier for most Coverage Enhancement Locations to carry out a Coverage survey. The Supplier shall recognise that in some cases less detail may be available for the Authority to provide to the Supplier and the Supplier shall have to make further enquiries regarding the Coverage Enhancement Location.

13.2.8 The key principles relating to Optional Services in Coverage Enhancement Locations are:

(a) The Supplier shall adopt the following principles in relation to shareable solutions:

(i)

13.2.9 The parties agree that for 3ES sites which are subject to national vetting policy, the Authority shall confirm with the relevant site point of contact what clearance would be required.

13.2.10 If a security clearance greater than BPSS is required for that site then the Authority may request if EE has suitable resource available to support delivery at that site, but recognises that if no resource is available that this site would not block the achievement of Key Milestone [REDACTED] and that another suitable site would need to be identified. Identification of an alternative site would need to be provided in a timely manner aligned to the CELS delivery plan

13.3 Authority Special Coverage at non 3ES sites

13.3.1 Supplier will provide a managed service to deliver Coverage solutions at non-3ES special coverage sites as listed in Annex J. The Services will include Coverage survey and acquisition through to design, build, test and acceptance of the site by the Authority or a User Organisation. Supplier will also provide service and maintenance services for the sites from acceptance of the specific site by the Authority or a User Organisation through to the end of the Term.

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14 Coverage in the London Underground

- 14.1 The Supplier shall deliver ESN Underground Coverage, including in-life service management, in the London Underground tunnels and stations by [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

15 Optional Services Catalogue

- 15.1 The Supplier shall produce one Optional Services Catalogue with two price sheet tabs (one listing pricing for items only available to the Authority and a second listing pricing for items only available to the User Organisations as the Authority price sheet tab shall not be visible to User Organisations).
- 15.2 Coverage solutions that have completed the Supplier's New Product Introduction process (NPI) and are available for sale to the Other Customers may be made available as Optional Services subject to any applicable [REDACTED] ESN specific activity around testing and assurance being met by the Authority using a Change Request.
- 15.3 The Supplier shall make available via the Optional Services Catalogue solutions offered to non-ESN customers that have concluded the Supplier's NPI process, and that the Parties agree are suitable; any additional Authority Requirements shall be funded and governed via the Change Process.
- 15.4 The Optional Services Catalogue content [REDACTED] shall be refreshed by the Supplier as follows:
- 15.4.1 On the [REDACTED] the Supplier shall provide as comprehensive an Optional Service Catalogue as it is reasonably able to achieve; and
- 15.4.2 A full Optional Services Catalogue will be produced by the Supplier and presented to the Authority for agreement by the Authority (not to be unreasonably withheld) no later than [REDACTED] from the Effective Date.
- 15.5 The following processes shall take place, to conclude at the [REDACTED] intervals during the Term, beginning on the Effective Date [REDACTED]:
- (a) *New Catalogue Item change* – Where a new item is to be introduced to the Optional Services Catalogue, the details will need to be approved through the Design Governance Process, as described in Paragraph 6.7 of this Schedule 2.1, prior to going through the Change Control Procedure.
 - (b) *End of life products/services* – Supplier shall have the unilateral right to remove products from the Optional Services Catalogue that are end of life or imminently becoming end of life by giving reasonable prior written notice, including evidence where requested by the Authority, to the Authority. For the avoidance of doubt, Products and Services which are installed will have an ongoing service period after they are removed from the Optional Services Catalogue. The duration of the ongoing service period will be agreed on a case-by-case basis, with both Parties using reasonable endeavours to ensure it continues for

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