

Guidelines for Fixed Radio Spectrum Licenses

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DEFINITIONS & ABRIVIATIONS

CEPT:	European Conference of Postal and Telecommunications Administrations is a coordinating body for European state telecommunications and postal organizations
CCDP:	Co-Channel-Dual-Polar
DSSS:	Direct Sequence Spread Spectrum
ECC:	European Communications Commission, is an executive body of the European Union responsible for proposing legislation, implementing decisions, upholding the Union's treaties and day-to-day running of the EU
EIRP:	Effective isotropic radiated power is the amount of power that a theoretical isotropic antenna would emit to produce the peak power density observed in the direction of maximum antenna gain.
ETSI:	European Telecommunications Standards Institute is an independent, non-profit, standardization organization in the telecommunications industry (equipment makers and network operators) in Europe, with worldwide projection
FHSS:	Frequency Hopping Spread Spectrum
FSS:	Fixed Satellite Service
FWA:	Fixed Wireless Access
GCC Telecoms Bureau:	A telecommunications Bureau, which conducts the coordination of spectrum assignments between neighbouring GCC countries and engages in the process of resolving cross-border interference cases.
ictQATAR :	Supreme Council of Information & Communication Technology (ictQATAR) is the regulator in Qatar established under Amiri decree Law No. 36 for 2004 and as further defined in Amiri decree Law No. 34 of 2006.
MP-MP:	Multipoint to Multipoint
P-P:	Point to Point
P-MP:	Point to Multipoint
QPSK:	Quadrature Phase shift Keying

RLAN: Radio Local Area Network

Technical schedule (1): The part of the radio spectrum license where the technical conditions for using the radio frequencies are defined.

Technical schedule (2): The part of the radio spectrum license, through which parameters relating to station/link are provided to ictQATAR 10 working days prior to deployment of the station/link for area-based or light license categories.

WAS: Wireless Access Service

Fixed Service as defined in the ITU Radio Regulations is a radio-communication service between specified fixed points. It includes point-to-point, point to multipoint and multipoint to multipoint (mesh) radio systems used for the transmission of voice, video and data information.

There are following licensing options available for fixed services, which will be explained in detail in the following sections:

- a) Point to point (frequency assigned)
- b) Point to point (block assigned)
- c) Point to point light licensed (65 GHz, 70 GHz and 80 GHz bands)
- d) Point to multipoint/Multipoint to multipoint (frequency assigned)
- e) Point to multipoint/ Multipoint to multipoint (block assigned)
- f) Point to point / Point to multipoint / Multipoint to multipoint Light Licensed (2.4 GHz, 5.4 GHz & 5.8 GHz bands)

Fixed links are generally used to provide network infrastructure and customer access applications across a wide range of frequency bands, currently ranging from 450MHz to 86GHz. Fixed point-to-point links mainly use digital technologies, directional antennas and typically operate at very high levels of propagation availability. These links are normally assigned individual frequencies by ictQATAR and are licensed on a link by link basis. However, there are also requirements for point to multipoint and multipoint to multipoint (mesh) network deployments for which greater flexibility to applicants is provided by ictQATAR. The guidelines for the license categories relating to Fixed Service are being explained in detail in the sections below.

Annex A to these guidelines provides the templates of the licenses alongwith the specific terms and conditions and technical schedule(s).

Annex B to these guidelines provides the application processing procedure.

Annex C to these guidelines provides application form to be used for license applications, modifications, renewals or cancellations. The application form describes the information and any documents that need to be provided for the application to be processed.

1. POINT TO POINT (FREQUENCY ASSIGNED) LICENSE

This license category is available with following options:

- a) **Point-to-Point (P-P) Frequency Assigned Link license:** This is the conventional P-P license whereby each individual link is licensed to use specific spot frequency/ies.
- b) **Point-to-Point (P-P) Frequency Assigned Area License:** this license is issued in cases where there is a requirement to provide flexibility in the deployment of links (e.g. organisations that require the flexibility to frequently change the location of transceivers due to their operational requirements). The Licensee can deploy the links using individual assigned frequencies anywhere within the defined geographic area subject to their own interference planning and avoidance of interference to users operating in adjacent frequencies and areas.

This section details the approach and technical frequency assignment criteria adopted in determining the applicable individual frequencies, together with the channel plan for the assigned frequencies and associated transmitter powers for two sub-categories of P-P frequency assigned license. The technical criteria are used as the basis for assessing new applications and also the applications for a technical reconfiguration of already licensed links.

When applying for a new license or a technical reconfiguration of an existing licensed link it is essential that the applicant takes into account the following policies:

- a) Applications will only be accepted and licenses will be issued only for digital P-P links in the following frequency bands; 7, 8, 13, 14, 18, 22, 28 and 38 GHz. No analogue P-P link allocations will be done in these bands. P-P telemetry links in UHF band are also covered under this license sub-category while the P-MP telemetry systems are covered under the P-MP License sub-category as illustrated in detail in section 4.
- b) The channel plans for these frequency bands are provided in Table 1 below.
- c) The use of hot standby and space diversity for backbone links to improve the service availability is encouraged and use of frequency diversity or multiple parallel links is not permitted unless and until an authorization in this regard is issued by ictQATAR.
- d) The details provided in the application form will be used to assign the frequencies, bandwidth and transmitter powers (EIRP) for those links that are individually assigned and will be specified in the technical schedule.
- e) Frequencies will be assigned either on horizontal polarisation (H), vertical polarisation (V) or Co-Channel-Dual-Polar (CCDP) basis. In the case of CCDP interference will be assessed for both polarisations but the EIRP (transmitter power) will be based on calculations for the worst case assessment which is horizontal polarisation.
- f) Operators are encouraged to use higher performance antenna options wherever possible to minimise interference potential especially on any congested site.
- g) Operators are encouraged to use more spectrally efficient modulation (e.g. 16, 32 and 64 QAM) especially for higher capacity systems to minimise the required bandwidth.
- h) To ensure efficient use of the spectrum it is important that the applicant ensures that the radio link is compatible with other links in the same location.
- i) Specific sites and the immediate surrounding area may be designated “transmit high” or “transmit low” in specific frequency bands, depending on the sub-band in which existing links on that site are transmitting. The criteria are described in the section 1.2 below.
- j) Requests for technical reconfigurations are treated on a case by case basis and wherever possible the existing frequencies will be retained. However, in some instances this may not be possible because of the potential of interference, in which case alternative frequencies will be offered.

Frequency assignment for the two options of P-P (frequency assigned) license category is made on:

- a) Link by link basis, or
- b) A limited geographic service area basis which is defined by a centre point and a maximum permitted radius from that point or the four coordinates of a rectangle depending on which ever best reflects and encompasses the geographic area requested by the applicant. The relevant coordinates will be provided in the technical schedule (1) of the license.

The licensee will be required to use the assigned list of frequencies within this service area. This frequency list, available on a confined area basis, will be managed by the licensee who is responsible for:

- i) Using frequencies from within their own assigned frequency list.
- ii) Notifying ictQATAR of all the links and their technical details 10 working days prior to the deployment as per the format provided in technical schedule (2) of the license so that ictQATAR can take them into account as necessary when making individual link assignments elsewhere in the frequency band.
- iii) Establishing mutually agreed co-ordination processes with licensees of adjacent areas/licensees to avoid interference.
- iv) Providing information to ictQATAR in those cases where cross-border co-ordination is required so that ictQATAR can manage these requests on behalf of the user.
- v) Providing information to ictQATAR to enable co-ordination with FSS in those bands shared with the satellite service.

1.1 Eligibility criteria

Eligible persons who may apply for a frequency assigned fixed link license are:

- a) The holders of Public Mobile Telecommunications Networks and Public Fixed Telecommunications Networks licenses
- b) Private network facility (Government and private corporations / companies) for their own inland or offshore private use only

Each application is considered on its merits and requirements such as e.g. security, safety, quality of service and capacity etc. The applicants for area-based licensing option are additionally required:

- a) to demonstrate that it currently or potentially has a major demand for spectrum
- b) to justify the need for area based allocation
- c) to indicate where it is planning to deploy the network and what would be the estimated capacity requirements.

The radio spectrum fee for the categories of license may also influence the applicant's choice of the licensing option.

1.2 Technical details

The relevant channel plans and allowed data rates / bandwidths are provided in Table 1 below. For link licenses the technical parameters are specified in the technical schedule (1), whereas, area licensees are required to follow the same standards while deploying the links within the specified area and submit the parameters to ictQatar 10 working days prior to change of location or deployment of any new link. There is also a requirement for area-based licenses to avoid deploying stations within the following protection distances from the edges of the defined area:

Frequency Band(s)	Distance from the Edge (m)
7, 8 and 13 GHz	500
15 and 18 GHz	300

22 GHz and 28 GHz	200
38 GHz	100

It should be noted that the data rates are indicative only of the spectral efficiency that might be achieved and do not constrain the actual data rate transmitted over the fixed link. For example, if adaptive modulation is planned then applicants should specify the appropriate data rate and channel spacing to be considered for frequency planning purposes based on a standard radio system type. The maximum EIRP is limited to +55 dBW in all the bands shared with the FSS as per Article 21 of the Radio Regulations and this restriction applies to all frequency bands. The operational EIRP will be determined on the basis of the minimum power required to meet the propagation availability requested by the applicant and will be specified in the technical schedule for individual links. Sharing requirements with the FSS will also be considered while determining the operational EIRP.

Table 1: Channel plans for fixed link assignments

Frequency band	Channel plan	Modulation type(s) allowed	Channel bandwidths (MHz)	Typical data rates	Allocation status
7 and 8 GHz (7125 – 8500 MHz: 7125 – 7425 MHz, 7425 – 7725 MHz, 7725 – 8725 MHz, 8275 – 8500 MHz) (Note 1)	ECC/REC/(02)06	Minimum of 4 state (e.g. QPSK)	[1.75, 3.5, 7, 14, 28 and 56 MHz]	2 Mbit/s – STM-1	Shared with FSS
13 GHz (12750 – 13250 MHz)	ITU-R Rec. F.497-7	Minimum of 4 state (e.g. QPSK)	1.75, 3.5, 7, 14, 28 and 56 MHz (Note 2)	2 Mbit/s – STM-1	Shared with FSS
15 GHz (14400 – 1530 MHz)	ITU-R Rec. F.636 - [4] (Note 3)	Minimum of 4 state (e.g. QPSK)	3.5, 7, 14, 28 and 56 MHz	2 Mbit/s – STM-1	Shared with FSS
18 GHz (17700 – 19700 MHz)	ITU-R Rec. F.595-9	Minimum of 4 state (e.g. QPSK)	27.5 and 55 MHz	34 Mbit/s – STM-1	Shared with FSS
22 GHz (21200 – 23600 MHz)	ITU-R Rec. F.637-[4] (Note 4)	Minimum of 4 state (e.g. QPSK)	3.5, 7, 14, 28, 56 and 112 MHz	2 Mbit/s – STM-1	Exclusive
28 GHz (27500 – 29500 MHz)	ITU-R Rec. F. 748-4	Minimum of 4 state (e.g. QPSK)	3.5, 7, 14, 28, 56 and 112 MHz	2 Mbit/s – STM-1	Exclusive
38 GHz (37000 – 39500 MHz)	ITU-R Rec. F.749-2	Minimum of 4 state (e.g. QPSK)	3.5, 7, 14, 28, 56 and 140 MHz	2 Mbit/s – STM-1	Exclusive

Note 1: The current frequency assignments will be migrated gradually as per the channel plans given in Annex 1 of the ECC Recommendation to avoid overlap of frequency bands and move to a standard 28 MHz channel spacing. ictQATAR will initially make new assignments taking into account existing analogue and digital assignments.

Note 2: Two adjacent 28 MHz channels can be merged to create one 56 MHz channel with the centre frequency lying in the central point of the distance between the merged channels. One or more 28 MHz channels can be sub-divided to support low capacity digital systems (see CEPT/ERC/REC 12-02 Annex A).

Note 3: ITU-R Rec. 636-3 is currently being updated to include 56 MHz channel plans.

Note 4: ITU-R Rec F.637-3 is currently being updated to include 56 MHz channel plans.

a) Transmit high / transmit low policy

For P-P frequency assigned link licenses, specific sites and the immediate surrounding area may be designated “transmit high” or “transmit low” in specific frequency bands, depending on the sub-band in which existing links on that site are transmitting. The proposed high / low protocol for transmitter sites is based on designating sites as being “High” or “Low” depending on whether the High or Low duplex channel sets are used for transmitting frequencies at the site¹. As this is a new policy, all current sites will be designated with default High/Low designation and in future, any new sites will be designated based on the high-low search radius defined in each of the frequency bands. In the case there is no preferred designation mentioned in the application form to be taken into account, the first assignment at a newly established site will determine whether it should be designated “High” or “Low”. For area-based licenses the applicants are required to provide the High/Low status of each sight during the notification process.

Table 2. Search radius – by band

Frequency Band(s)	High – Low search radius (m)
7, 8 and 13 GHz	500
15 and 18 GHz	300
22 GHz and 28 GHz	200
38 GHz	100

2. POINT TO POINT BLOCK ASSIGNED LICENSE

This section provides further details on the P-P block assigned license category. In this license subcategory frequency blocks are assigned on national basis and are to be self-managed by the licensee. To ensure efficient use of the spectrum these licenses are only available to major users of fixed links that require a greater number of links in a frequency band over a large geographic area (e.g. mobile network operators and oil and gas companies). Spectrum will be awarded in the preferably larger channel bandwidths (e.g. 28 MHz or 55 MHz), according to the applicable channel plan(s) which are detailed in Table 1 above. The intention is to award adjacent blocks of spectrum, wherever possible, to the same licensee to avoid the need for either guard bands, that are spectrally inefficient, or co-ordination of assignments with those undertaken by ictQATAR in adjacent frequencies. The number of blocks awarded will be determined in discussion with ictQATAR and the operator will be required to provide the necessary technical information to substantiate their requests. It should be noted that if ictQATAR identifies that spectrum is not being used efficiently as per the requirements provided earlier by the applicant the revocation procedure may be invoked accordingly.

It must be clear that the spectrum licenses are issued to support the internal communications of large organisations including backhaul communication. The provision of public telecommunication services directly to end users is prohibited unless and until an individual or a class license is issued for the same. Economics and Licensing Department (Regulatory Authority) of ictQATAR may be consulted for further details in this regard.

¹ At some sites it is recognised that due to existing assignments this may not be possible and they will continue to have links in a frequency band transmitting in both the lower and upper half of the band.

The licensee will be responsible for managing the spectrum and determining which frequencies to use, within the licensed block, and to ensure there is no potential for interference into other users operating in adjacent frequencies. If there is a need for coordination with spectrum licensees in other countries, the licensee may contact ictQATAR who will undertake the coordination with neighbouring countries through the GCC Telecoms Bureau.

2.1 Eligibility Criteria

To ensure efficient use of the spectrum, block assigned license is only available to major users of fixed link spectrum. Currently requests for blocks of spectrum can only be accepted from the following organisations:

- a) The holders of Public Mobile Telecommunications Networks and Public Fixed Telecommunications Networks licenses.
- b) The Ministry of Interior.

Applications for block assigned license from other organisations will be considered on a case by case basis. Any organisation which is a major user of fixed links (e.g. oil & gas companies etc.) that wishes to be assigned a frequency block should contact ictQATAR by letter or email to discuss their potential requirements in advance of submitting any license application. The applicant is hence required:

- d) to demonstrate that it currently or potentially has a major demand for fixed link spectrum assignments.
- e) to justify the need for nationwide block allocations.
- f) to indicate where it is planning to deploy links and what would be the estimated capacity requirements.
- g) to show that it has the competence to manage the assigned blocks / bands for fixed links with due attention to efficient use of spectrum, avoidance of interference and the management of any cases of interference which may arise.

2.2 Technical details by frequency band

Licenses are only valid for the deployment of digital P-P links in the applicable frequency bands and associated channels detailed in Table 1. Band-assigned license holders are encouraged to take into account and conform to the relevant stated channel plans. It should be noted that it may not be possible for ictQATAR to identify suitable blocks of frequencies in all the frequency bands listed in this table. Sites and frequencies used for the fixed link stations shall comply with the requirements specified in ITU Radio Regulations Articles 21.2 – 21.6.

Many of the policies illustrated for individual point to point links also applicable to the band –assigned licenses. These are:

- a) Only digital point to point links can be deployed in the following frequency bands; 7, 8, 13, 14, 18, 22, 28 and 38 GHz.
- b) Frequencies will either be horizontal polarisation (H), vertical polarisation (V) or Co-Channel-Dual-Polar (CCDP). In the case of CCDP interference will be assessed for both polarisations but the EIRP (transmitter power) will be based on calculations for the worst case assessment which is horizontal polarisation.
- c) Operators are encouraged to use higher performance antenna options wherever possible to minimise interference potential especially on any congested sites.
- d) All equipment that is planned to be deployed must be type approved. Operators are encouraged to use more spectrally efficient modulation (e.g. 16, 32 and 64 QAM) especially for higher capacity systems to minimise the required bandwidth.

- e) Maximum e.i.r.p. in any band is +55 dBW.

3. POINT TO POINT LIGHT LICENSE FOR 65 GHZ, 70 GHZ AND 80 GHZ BANDS

This section details the approach and technical criteria that apply to the P-P light license category for 65, 70 and 80 GHz bands. The licenses for these bands are non-exclusive national licenses which will allow licensees to deploy point to point wireless links anywhere within the State of Qatar. There will be no individual frequency planning or co-ordination function undertaken by ictQATAR but the licensee must notify details of the stations that have been deployed 10 working days prior to any new deployment using the format provided in the technical schedule (2) of the license. These Licenses are issued on non-interference & non-protection basis and hence licensees are expected to resolve interference problems between themselves.

A maximum e.i.r.p. of +55 dBW applies in all the bands.

3.1 Eligibility Criteria

Eligible persons who may apply for a fixed link license are:

- The holders of Public Mobile Telecommunications Networks and Public Fixed Telecommunications Networks licenses.
- Private network facility (Government and private corporations / companies) for their own inland or offshore private use only.

3.2 Technical details

The channel plans and the channel bandwidths allowed under the license are detailed below:

Table 3. Point to point links (light licensing) channel plan

Frequency band	Channel plan	Channel band widths	Equipment specifications
65 GHz (64 – 66 GHz)	ECC/REC/(05)02 Annex 3	Minimum 30 MHz TDD/FDD (multiple slots can be aggregated for larger bandwidth)	See ETSI EN 302 217-3 for guidance on equipment specifications to operate in these bands
70 GHz (71.125 – 75.825 GHz)	ECC/REC/(05)07, Annex 1	Minimum of 250 MHz Maximum of 4.75 GHz	
80 GHz (81.125 – 85.875 GHz)	ECC/REC/(05)07, Annex 2 (Note 1)	Minimum of 250 MHz Maximum of 4.75 GHz	

Note 1: The unwanted emission mask for fixed service in Annex 6 of ECC/REC/(05)07 will apply to protect the EESS operating in the adjacent band

The CEPT (ECC) recommendations referred to in the above table can be found at <http://www.eroocdb.dk/doks/doccategoryECC.aspx?doccatid=2>.

4. POINT TO MULTIPOINT (P-MP) / MULTIPOINT TO MULTIPOINT (MP-MP) (FREQUENCY ASSIGNED) LICENSE

This section provides information on the technical considerations for the issuing of P-MP / MP-MP (frequency Assigned) license which is available for the deployment of a Fixed Wireless Network (including SCADA and other telemetry communications networks) using assigned frequencies. The license is available in two options:

- a) **P-MP Frequency Assigned Network License:** This is the conventional P-MP license whereby a small network comprising of a single base station and multiple outstations is licensed to use specific spot frequency/ies.
- b) **P-MP/MP-MP Frequency Assigned Area License:** The Licensee can deploy a network comprising of multiple base stations and multiple outstations using individually assigned frequencies anywhere within the defined geographic area subject to their own interference planning and avoidance of interference to users operating in adjacent frequencies and areas. These licenses may also be available to those organisations that have the requirement for deploying considerably large network and require the flexibility to frequently change the location of transceivers due to their operational requirements.

Applications for point to multipoint systems and multipoint to multipoint systems are currently being accepted for licenses in the following bands, however, further bands may be included in future subject to availability or spectrum strategic review:

- a) **4.9 GHz:** this band has been identified for providing public safety broadband access.
- b) **26 GHz:** this band has been identified for providing private FWA access. Any current license with P-MP / MP-MP fixed link assignments in other bands will be individually reviewed upon request for renewal, and the licensee may be requested to move to the 26GHz band if required, or given notice that a move to the 26GHz band will be required in the future.
- c) **450 – 470 MHz & 360 – 380 MHz:** these bands have been mainly identified for Private Mobile Radio (PMR) use however, small portions of these bands have also been identified for the deployment of telemetry systems (including SCADA) such as those used by utility and industrial companies where continuous monitoring of operations and control of equipment at multiple locations is necessary. The data may be transmitted bi-directionally or in one direction only. The P-MP/MP-MP frequency assigned area license is available over a local or a wide coverage area.

The technical schedule (1) of the license will provide the details of the frequencies assigned along with associated geographic coverage area in case of area based licenses.

4.1 Eligibility Criteria

Eligible persons who may apply for the license are:

- a) The holders of Public Mobile Telecommunications Networks and Public Fixed Telecommunications Networks licenses
- b) Private network facility (Government and private corporations / companies) for their own inland / offshore private use only.

Only Government ministries/ organizations involved in providing public safety services are allowed to apply for P-MP/MP-MP frequency assigned area license in 4.9GHz band.

The applicants for area-based licensing option are additionally required:

- a) to demonstrate that it currently or potentially has a major demand for spectrum
- b) to justify the need for area based allocation
- c) to indicate where it is planning to deploy the network and what would be the estimated capacity requirements.

The radio spectrum fee for the categories of license may also influence the applicant's choice of the licensing option.

4.2 Technical details

a) 4.9 GHz Band:

The 4.9 GHz band is available with 1, 5, 10 or 20 MHz channel bandwidths as per ITU-R recommendation M.1826 that will be assigned as per the applicant's requirements.

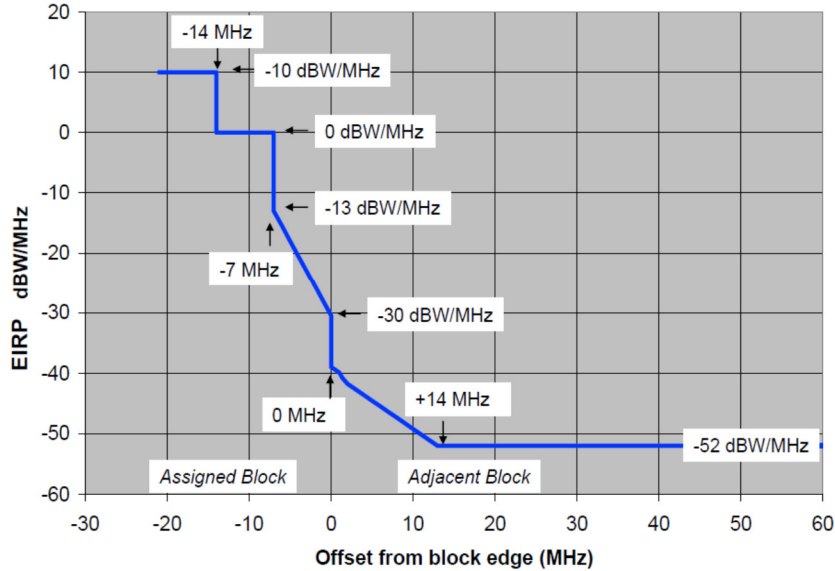
b) 26 GHz Band:

The 26 GHz band will be available for assignment with 3.5 MHz - 56 MHz channel bandwidths. The lower half of the band will be base station transmit for point to multipoint network. The channel plan as provided in CEPT/ERC/REC 13-02 E, Annex B will be followed.

For area-based licenses, the maximum field strength at the edge of the radius of coverage plus a 10 km buffer zone must not exceed 50.8 dB μ V/m.

All multipoint equipment deployed in the 26 GHz band must comply with the transmitter Block Edge Masks (BEM) specified below regardless of the bandwidth of the transmitters. They are intended to provide protection from interference to systems operating in adjacent channels. The mask below applies to central base station.

Figure 1: Base station block edge mask



The block edge mask limits can be extended up to 20 dB for terminal stations.

c) 450-470 MHz & 360-380 MHz bands

These bands have mainly been allocated for Private Mobile Radio. However, small portions of these bands are being allocated for simplex or duplex operations of telemetry systems.

Repeater stations are not permitted with the frequency assigned network license that operate over a small restricted area.

The applicable technical parameters are described below:

Table 4. Scanning telemetry technical criteria

Parameter	Frequency assigned network License	Frequency assigned Area License	
		Local-Area (25 km)	Wide-area/nationwide (Over 25 Km)
Number of channels assigned	1	1 or more	1 or more
Maximum coverage radius from the centre point	N/A	Local-Area (25 km)	Wide-area/nationwide (Over 25 Km)
Multi-site coverage	No	Yes	Yes
Channel bandwidth	2 x 12.5 kHz or 2 x 6.25 kHz	2 x 12.5 kHz or 2 x 6.25 kHz	2 x 12.5 kHz or 2 x 6.25 kHz
Maximum transmitter power level	1 W e.r. p	5 W e.r.p. (12.5 kHz)	10 W e.r.p.

		5 W e.r.p. (6.25 kHz)	
Maximum antenna height above ground	10 m	20 m	30 m
Use of repeaters allowed	No	Yes	Yes

The assessment of the field strength values to determine how often the spectrum can be reused will be done using:

- methods and criteria described in ITU-R Recommendations P.1546² & P.1812-1³
- onsite monitoring

5. POINT TO MULTIPOINT (P-MP)/ MULTIPOINT TO MULTIPOINT (MP-MP) (BLOCK ASSIGNED) LICENSE

This section provides information on the technical considerations for the issuing of point to multipoint (P-MP) / multipoint to multipoint (MP-MP) (block assigned) licenses which are available on a national basis. To ensure efficient use of the spectrum these licenses are only available to major users of Multipoint Systems that require the network deployment over a large geographic area (e.g. oil and gas and utility provider companies).

The number of blocks awarded will be determined in discussion with ictQATAR and the operator will be required to provide the necessary technical information to substantiate their requests. It should be noted that if ictQATAR identifies that spectrum is not being used efficiently as per the requirements provided earlier by the applicant the revocation procedure may be invoked accordingly.

Applications for the Multipoint block assigned license will be accepted for licenses in the following bands:

- 4.9 GHz
- 26 GHz frequency band

It must be clear that the spectrum licenses are available only for carrying out internal communications within large organisations. The provision of public telecommunication services directly to end users is prohibited unless and until an individual or a class license is issued for the same. Economics and Licensing Department (Regulatory Authority) of ictQATAR may be consulted for further details in this regard. Frequency block assignment for multipoint systems aims to minimise the potential for interference between licensees. However, it may be necessary for licensees to accommodate (in addition to observing the block Edge Mask limits as given in figure 1 for 26 GHz band assignments), additional guard bands within their licensed frequency channel to avoid the potential for interference between adjoining assignments. It is also expected that licensees will co-ordinate between themselves to facilitate the operation of these networks. However co-ordination with neighbouring countries will be undertaken through ictQATAR.

² "Method for point-to-area predictions for terrestrial services in the frequency range 30 MHz to 3 000 MHz", ITU-R P.1546

³ "A path-specific propagation prediction method for point-to-area terrestrial services in the VHF and UHF bands", ITU-R P.1812-1

P-MP/MP-MP block assigned licenses are available for national coverage only and applications will only be accepted for national licenses where the geographic area that will be served is greater than 4,000 km². Where a smaller geographic area is to be served there is the possibility of applying for frequency assigned area P-MP/MP-MP licenses as described in Section 4.

The management of the deployment of the network infrastructure within the licensed frequency block is the responsibility of the licensee. The licensee must retain a full set of information on the location and equipment deployed, which shall be provided on request by ictQATAR, as per the specified format.

5.1 Eligibility Criteria

Eligible persons who may apply for a fixed link license are:

- a) The holders of Public Mobile Telecommunications Networks and Public Fixed Telecommunications Networks licenses
 - b) Private network facility (Government and private corporations / companies) for their own inland / offshore private use only
- Technical details

Like P-P block assigned license, applications for block assigned P-MP/MP-MP licenses will be considered on a case by case basis. Any organisation which is a major user of multipoint network (e.g. oil / gas company) that wishes to be assigned a spectrum block should contact ictQATAR by letter or email to discuss their potential requirements in advance of submitting any license application.

The organisation will be required:

- a) to demonstrate that it currently or potentially has a major demand for a nationwide multipoint network.
- b) to justify the need for nationwide block allocations and to demonstrate that it will efficiently use the assigned block on a national basis.
- c) to indicate where it is planning to deploy network and its capacity requirements.
- d) to show that it has the competence to manage the assigned blocks with due attention to efficient use of spectrum, avoidance of interference and the management of any cases of interference which may arise.

5.2 Technical details

a) 4.9 GHz Band

Spectrum will be awarded in the preferably in 10 or 20 MHz blocks according to the applicable channel plan(s) as referred in section 4.2 above.

b) 26GHz Band

Spectrum will be awarded in the preferably in 28 or 56 MHz blocks according to the applicable channel plan(s) as referred in section 4.2 above.

6. POINT TO POINT / POINT TO MULTIPOINT/ MULTIPOINT-MULTIPOINT LIGHT LICENSE FOR 2.4 GHZ, 5.4 GHZ AND 5.8 GHZ BANDS

This section details the approach and technical criteria that apply to the 2.4, 5.4 & 5.8 GHz bands. The licenses for these bands are non-exclusive national licenses, which will allow licensees to deploy point to point / point to multipoint wireless links outdoor⁴ anywhere within the State of Qatar. There will be no individual frequency planning or co-ordination function undertaken by ictQATAR but the licensee must notify details of the stations using the format provided in the technical schedule (2) of the license 10 working days prior to any new deployment or change of location. The licenses will be issued on a non-interference non-protection basis.

Please note that indoor⁵ use of the bands 2400–2483.5, 5150 - 5350 MHz, 5470 – 5725 MHz and 5725 – 5875 is class licensed. Guidelines for the use of ISM bands may be consulted for further details.

It must be clear that the spectrum licenses are available only for carrying out internal communications within the licensee's organisation. The provision of public telecommunication services directly to end users is prohibited unless and until an individual or a class license is issued for the same. Economics and Licensing Department (Regulatory Authority) of ictQATAR may be consulted for further details in this regard.

6.1 Eligibility Criteria

Eligible persons who may apply for a fixed link license are:

- a) The holders of Public Mobile Telecommunications Networks and Public Fixed Telecommunications Networks licenses
- b) Private network facility (Government and private corporations / companies) for their own inland or offshore private use only

6.2 Technical details by frequency band

The channel plans with 20 MHz channel bandwidths are applicable for all the following bands.

a) 2400–2483.5 MHz:

This band is identified for the provision of Radio Local Area Networks (RLANs). The following requirements apply to outdoor deployments in this band:

- i. Maximum mean e.i.r.p. for FHSS:
 - 1 Watt (For systems employing at least 75 non-overlapping hopping channels)
 - 125 mW (For all other systems)
- ii. Maximum mean e.i.r.p for DSSS: 1 watts

⁴ Outdoor use refers to the use of equipment with power more than 100mW.

⁵ Indoor use refers to the use of equipment with power upto 100mW.

- iii. For point-to-point operations, transmitting antennas with directional gain greater than 6 dBi may be deployed provided the maximum peak output power and the maximum conducted output power is reduced by 1 dB for every 3 dB that the directional gain of the antenna exceeds 6 dBi.

b) 5470 – 5725 MHz:

This band is identified for the provision of Wireless Access Services (WAS) including Radio Local Area Networks (RLANs). The following requirements apply to outdoor deployments in this band:

- i. Maximum mean e.i.r.p. of 1 W
- ii. Maximum mean density of 50 mW/MHz in any 1 MHz band.
- iii. WAS and RLANs operating in the band shall either deploy transmitter power control of at least 3dB on the maximum power or if transmitter control is not used then the maximum e.i.r.p. and mean power density shall be reduced by 3 dB.
- iv. WAS and RLANs operating in the band shall use dynamic frequency selection (DFS).
- v. Equipment must be type approved against a suitable specifications such as EN 301 893.

c) 5725 – 5875 MHz:

This band is identified for the provision of fixed broadband wireless access. The following requirements apply to outdoor deployments in this band:

- i. Maximum mean e.i.r.p. of 2 W Maximum mean density of 23 dB/MHz.
- ii. Both DFS and TPC (12 dB range) should be implemented.
- iii. The frequency range 5795 – 5815 MHz should not be used and should be notched out to protect RTTT devices.
- iv. Equipment must be type approved against a suitable specifications such as EN 302 502.

Additionally the e.i.r.p. spectral density of the transmitter emissions should not exceed the following values for the elevation angle θ (degrees) above the local horizontal plane (of the Earth) to protect FSS GSO satellite receivers.

For sectorised (e.g. P-MP Central or Base Station) and Omni-directional deployments:

- i. -7 dB(W/MHz) for $0^\circ \leq \theta < 4^\circ$
- ii. $-2.2 - (1.2 * \theta)$ dB(W/MHz) for $4^\circ \leq \theta \leq 15^\circ$
- iii. $-18.4 - (0.15 * \theta)$ dB(W/MHz) for $\theta > 15^\circ$

For P-MP Customer Terminal Station and P-P deployments:

- i. -7 dB(W/MHz) for $0^\circ \leq \theta < 8^\circ$
- ii. $-2.68 - (0.54 * \theta)$ dB(W/MHz) for $8^\circ \leq \theta < 32^\circ$
- iii. -20 dB(W/MHz) for $32^\circ \leq \theta \leq 50^\circ$
- iv. $-10 - (0.2 * \theta)$ dB(W/MHz) for $\theta > 50^\circ$

7. NOTE ON APPLICABLE STANDARDS

Any equipment which is licensed under a Radio Spectrum License must meet the requirements of the ictQATAR Type Approval Guidelines for Radio Equipment and Telecommunications Terminal Equipment⁶.

In general the following standards and technical requirements are applied for licensing in Qatar:

- a) ITU Recommendations issued by the International Telecommunication Union (ITU) in its International Radio Regulations. The ITU divides the world into three ITU regions for the purposes of managing the global radio spectrum. Qatar is in Region 1, which also includes: Europe, Middle East, Africa, the former Soviet Union (including Siberia and Mongolia).
- b) ETSI standards, administered by the European Telecommunications Standards Institute (ETSI)
- c) ECC Recommendations issued by the European Communications Office

8. SPECTRUM FEES

Please see the "Schedule of Radio Spectrum Fees" available on ictQATAR's website for details.

9. CONTACT DETAILS

For further queries, please contact:

Manager Spectrum Affairs,
Regulatory Authority,
The Supreme Council of Information & Communication Technology (ictQATAR)
P.O. Box 23264, Al Nassr Tower, Post Office Roundabout, Al Corniche,
Doha, Qatar
Fax: 44830630
Email: spectrumaffairs@ict.gov.qa

⁶ http://www.ictqatar.qa/sites/default/files/documents/TypeApprovalPolicy_0809.pdf

ANNEX A: LICENSE TEMPLATES AND TERMS & CONDITIONS



دولة قطر

State of Qatar

المجلس الأعلى للاتصالات و تكنولوجيا المعلومات

ictQATAR

Regulatory Authority

Point to Point Frequency Assigned Link License

The Supreme Council of Information and Communication Technology ("ictQATAR"), in exercising the powers conferred on it by Articles (3) and (4) of Decree Law No. (34) of 2006, grants to the Licensee specified, authorisation to keep, have possession of, install, maintain, work and use radio transmitting and receiving equipment between specified fixed points using assigned frequencies as per the general terms and conditions for radio spectrum licensing, specific terms and conditions, special conditions (if any) and technical schedule (s) of this License.

License Number

Licensee:

Address:

License Type:

Commencement and Termination Dates:

The License comes into effect on DD/MM/YY and subject to revocation or suspension, expires on DD/MM/YY unless renewed in accordance with the Regulations.

Signed:

On behalf of the Supreme Council of Information and Communication Technology ("ictQATAR")

Date:

Official Stamp

Specific Terms & Conditions

1. Technical conditions

- 1.1 Sites and frequencies for the fixed link stations shall comply with the requirements specified in ITU Radio Regulations Articles 21.2 – 21.6.

Special Conditions

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Technical Schedule (1)

This schedule forms part of the point to point frequency assigned link License No. XXXX issued to XXXX, the Licensee on [Date].

	Site A	Site B
Location (lat and long)		
Path length		
Transmit frequency		
Polarisation		
Transmitter eirp (Note 1)		
Bandwidth (MHz)		
Equipment manufacturer		
Equipment model number		
Bit rate (Mbps)		
Modulation		
Emission class		

Height of antenna		
Antenna manufacturer		
Antenna model number		
Hi/Lo Status		

Note : Maximum eirp measured at the output of the antenna.



دولة قطر

State of Qatar

المجلس الأعلى للاتصالات و تكنولوجيا المعلومات

ictQATAR

Regulatory Authority

Point to Point Frequency Assigned Area License

The Supreme Council of Information and Communication Technology ("ictQATAR"), in exercising the powers conferred on it by Articles (3) and (4) of Decree Law No. (34) of 2006, grants to the Licensee specified, authorisation to keep, have possession of, install, maintain, work and use radio transmitting and receiving equipment between specified fixed points using assigned frequencies that may be reused within the specified confined area as per the general terms and conditions for radio spectrum licensing, specific terms and conditions, special conditions (if any) and technical schedule (s) of this License.

License Number:

Licensee:

Address:

License Type:

Commencement and Termination Dates:

The License comes into effect on DD/MM/YY and subject to revocation or suspension, expires on DD/MM/YY unless renewed in accordance with the Regulations.

Signed:

On behalf of the Supreme Council of Information and Communication Technology ("ictQATAR")

Date:

Official Stamp

Specific Terms & Conditions

1. Technical conditions

- 1.1 Sites and frequencies for the fixed link stations shall comply with the requirements specified in ITU Radio Regulations Articles 21.2 – 21.6.

Special Conditions

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Technical Schedule (1)

This schedule forms part of the point to point frequency assigned area license No. XXXX issued to XXXX, the Licensee on [Date].

Frequencies					
Maximum power					
Protection distance from the edge					
Geographic Area					
Northern limit:	Lat:		Western limit:	Long:	
Southern limit:	Lat:		Eastern limit:	Long:	
OR ⁷					
Centre point:	Lat:	Long:	Radius (kms)		

⁷ There is the option of defining the geographic area as a rectangle or a circle depending on which best fits.

Technical Schedule (2)

This schedule forms part of the point to point frequency assigned area license No. XXXX issued to XXXX, the Licensee on [Date].

Location (Lat and Long)	
Site name / address	
Frequency(ies)	
Channel bandwidth	
Transmitter power (e.r.p.) W	
Equipment manufacturer	
Equipment model number	
Antenna height	
Antenna manufacturer	
Antenna model	
Antenna Gain	
Hi/Lo Status	

Note: Maximum eirp measured at the output of the antenna.



دولة قطر

State of Qatar

المجلس الأعلى للاتصالات و تكنولوجيا المعلومات

ictQATAR

Regulatory Authority

Point to Point Block Assigned License

The Supreme Council of Information and Communication Technology (“ictQATAR”), in exercising the powers conferred on it by Articles (3) and (4) of Decree Law No. (34) of 2006, grants to the Licensee specified, authorisation to keep, have possession of, install, maintain, work and use radio transmitting and receiving equipment between specified fixed points within the State of Qatar as per the general terms and conditions for radio spectrum licensing, specific terms and conditions, special conditions (if any) and technical schedule (s) of this License.

License Number

Licensee:

Address:

License Type:

Commencement and Termination Dates:

The License comes into effect on DD/MM/YY and subject to revocation or suspension, expires on DD/MM/YY unless renewed in accordance with the Regulations.

Signed:

On behalf of the Supreme Council of Information and Communication Technology (“ictQATAR”)

Date:

Official Stamp

Specific Terms & Conditions

1. Radio equipment operation

1.1 The licensee shall manage the deployment of digital point to point links within the State of Qatar and shall take steps to ensure to minimise interference outside the frequency block and into neighbouring countries.

2. Technical conditions

2.1 Sites and frequencies used for the fixed link stations shall comply with the requirements specified in ITU Radio Regulations Articles 21.2 – 21.6.

2.2 Maximum EIRP of any transmitter must not exceed +55 dBW.

3. Definitions

3.1 **EIRP:** effective isotropic radiated power means the amount of power that a theoretical isotropic antenna would emit to produce the peak power density observed in the direction of maximum antenna gain.

Special Conditions

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Technical Schedule (1)

This schedule forms part of the point to point block assigned license No. XXXX issued to XXXX, the Licensee on [Date].

Frequency Band	
Maximum power allowed	



دولة قطر

State of Qatar

المجلس الأعلى للاتصالات و تكنولوجيا المعلومات

ictQATAR

Regulatory Authority

Point to Point Light License For 65 GHz, 70 GHz and 80 GHz bands

The Supreme Council of Information and Communication Technology (“ictQATAR”), in exercising the powers conferred on it by Articles (3) and (4) of Decree Law No. (34) of 2006, grants to the Licensee specified, authorisation to keep, have possession of, install, maintain, work and use radio transmitting and receiving equipment between particular fixed points over 64-66 GHz, 71.125-75.875 GHz and 81.125-85.875 GHz frequency bands anywhere in the State of Qatar as per the general terms and conditions for radio spectrum licensing, specific terms and conditions, special conditions (if any) and technical schedule (s) of this License.

License Number:

Licensee:

Address:

License Type:

Commencement and Termination Dates:

The License comes into effect on DD/MM/YY and subject to revocation or suspension, expires on DD/MM/YY unless renewed in accordance with the Regulations.

Signed:

On behalf of the Supreme Council of Information and Communication Technology (“ictQATAR”)

Date:

Official Stamp

Specific Terms & Conditions

1. Radio Equipment Operation

- 1.1 The equipment must be deployed and operated as per the parameters provided in technical schedule (2) after its submission unless there is an objection from ictQATAR in which case the amended parameters must be complied with.
- 1.2 Use of the frequency bands is on non-interference non-protection basis.
- 1.3 Maximum EIRP of any transmitter must not exceed +55 dBW.

2. Definitions

- 2.1 **EIRP:** effective isotropic radiated power means the amount of power that a theoretical isotropic antenna would emit to produce the peak power density observed in the direction of maximum antenna gain.
- 2.2 **ictQATAR:** The regulator in Qatar established under Amiri decree Law No. 36 for 2004 and as further defined in Amiri decree Law No. 34 of 2006.
- 2.3 **Technical Schedule (2):** A part of a radio spectrum license, through which parameters relating to station/link are provided to ictQATAR 10 working days prior to deployment of the station/link for area-based or light license categories.

Special conditions

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Technical Schedule (2)

This schedule forms part of the point to point light License for 65 GHz, 70 GHz and 80 GHz bands license No. XXXX issued to XXXX, the Licensee on [Date].

	Site A	Site B
Location (lat and long)		
Path length		
Transmit frequency		
Polarisation		
Transmitter eirp (Note)		
Bandwidth (MHz)		
Equipment manufacturer		
Equipment model number		
Bit rate (Mbps)		
Modulation		
Emission class		
Height of antenna		
Antenna manufacturer		
Antenna model number		
Antenna Gain		

Note: Maximum eirp measured at the output of the antenna



دولة قطر

State of Qatar

المجلس الأعلى للاتصالات و تكنولوجيا المعلومات

ictQATAR

Regulatory Authority

Point to Multipoint Frequency Assigned Network License

The Supreme Council of Information and Communication Technology ("ictQATAR"), in exercising the powers conferred on it by Articles (3) and (4) of Decree Law No. (34) of 2006, grants to the Licensee specified, authorisation to keep, have possession of, install, maintain, work and use point to multipoint fixed wireless network comprising of a single base station and multiple out stations using assigned frequency(ies) as per the general terms and conditions for radio spectrum licensing, specific terms and conditions, special conditions (if any) and technical schedule (s) of this License.

License Number

Licensee:

Address:

License Type:

Commencement and Termination Dates:

The License comes into effect on DD/MM/YY and subject to revocation or suspension, expires on DD/MM/YY unless renewed in accordance with the Regulations.

Signed:

On behalf of the Supreme Council of Information and Communication Technology ("ictQATAR")

Date:

Official Stamp

Special Conditions
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Technical Schedule (1)

This schedule forms part of the point to multipoint frequency assigned network license No. XXXX issued to XXXX, the Licensee on [Date].

Base Station						
Location (Lat and Long)						
Site name						
Frequency(ies)						
Bandwidth						
Transmitter power						
Equipment manufacturer						
Equipment model number						
Antenna height (AGL or ASL)						
Antenna manufacturer						
Antenna model number						
Out station (OS) details (where applicable)	OS1	OS2	OS3	OS4	OS5	OSXXX
Location(Lat and Long)						
Site name						
Frequency(ies)						

Equipment manufacturer						
Equipment model number						



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State of Qatar

المجلس الأعلى للاتصالات و تكنولوجيا المعلومات

ictQATAR

Regulatory Authority

Point to Multipoint/ Multipoint to Multipoint Frequency Assigned Area License

The Supreme Council of Information and Communication Technology ("ictQATAR"), in exercising the powers conferred on it by Articles (3) and (4) of Decree Law No. (34) of 2006, grants to the Licensee specified, authorisation to keep, have possession of, install, maintain, work and use point to multipoint and/or multipoint to multipoint fixed wireless network comprising of multiple base stations and multiple out stations within the specified geographic area and using radio frequency/ies that may be reused within the area as per as per the general terms and conditions for radio spectrum licensing, specific terms and conditions, special conditions (if any) and technical schedule (s) of this License.

License Number:

Licensee:

Address:

License Type:

Commencement and Termination Dates:

The License comes into effect on DD/MM/YY and subject to revocation or suspension, expires on DD/MM/YY unless renewed in accordance with the Regulations.

Signed:

On behalf of the Supreme Council of Information and Communication Technology ("ictQATAR")

Date:

Official Stamp

Special Conditions
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Technical Schedule (1)

This schedule forms part of the point to multipoint/ multipoint to multipoint frequency assigned area license No. XXXX issued to XXXX, the Licensee on [Date].

Frequencies									
Maximum power allowed									
Block Edge Mask									
Geographic Area:									
Northern limit:	Lat:		Long:		Western limit:	Lat:		Long:	
Southern limit:	Lat:		Long:		Eastern limit:	Lat:		Long:	
OR ⁸									
Centre point:	Lat:		Long:		Radius (kms):				

Technical Schedule (2)

This schedule forms part of the point to multipoint/ multipoint to multipoint frequency assigned area license No. XXXX issued to XXXX, the Licensee on [Date].

⁸ There is the option of defining the geographic area as a rectangle or a circle depending on which best fits.

Base Station (For P-MP) / Mesh Node (For MP-MP)						
Location (Lat and Long)						
Site name						
Frequency(ies)						
Bandwidth						
Transmitter power						
Equipment manufacturer						
Equipment model number						
Antenna height (AGL or ASL)						
Antenna manufacturer						
Antenna model number						
Out station (OS) details (For P-MP)	OS1	OS2	OS3	OS4	OS5	OSXXX
Location(Lat and Long)						
Site name						
Frequency(ies)						
Equipment manufacturer						
Equipment model number						



دولة قطر

State of Qatar

المجلس الأعلى للاتصالات و تكنولوجيا المعلومات

ictQATAR

Regulatory Authority

Point to Multipoint/ Multipoint to Multipoint Block Assigned License

The Supreme Council of Information and Communication Technology ("ictQATAR"), in exercising the powers conferred on it by Articles (3) and (4) of Decree Law No. (34) of 2006, grants to the Licensee specified, authorisation to keep, have possession of, install, maintain, work and use point to multipoint and/or multipoint to multipoint fixed wireless network comprising of multiple base stations and multiple out stations using assigned block frequencies anywhere within the state of Qatar as per the general terms and conditions for Radio Spectrum licensing, specific terms and conditions, special conditions (if any) and technical schedule (s) of this License.

License Number:

Licensee:

Address:

License Type:

Commencement and Termination Dates:

The License comes into effect on DD/MM/YY and subject to revocation or suspension, expires on DD/MM/YY unless renewed in accordance with the Regulations.

Signed:

On behalf of the Supreme Council of Information and Communication Technology ("ictQATAR")

Date:	Official Stamp
Special Conditions	
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Technical Schedule (1)	
This schedule forms part of the point to multipoint/ multipoint to multipoint block assigned License No. XXXX issued to XXXX, the Licensee on [Date].	
Frequency Band	
Block Edge Mask	



دولة قطر

State of Qatar

المجلس الأعلى للاتصالات و تكنولوجيا المعلومات

ictQATAR

Regulatory Authority

Point to Point/Point to Multipoint/ Multipoint to Multipoint Light License for 2.4 GHz, 5.4 GHz & 5.8 GHz Bands

The Supreme Council of Information and Communication Technology ("ictQATAR"), in exercising the powers conferred on it by Articles (3) and (4) of Decree Law No. (34) of 2006, grants to the Licensee specified, authorisation to keep, have possession of, install, maintain, work and use point to point/point to multipoint/multipoint to multipoint fixed wireless link / network comprising of multiple base stations and multiple out stations using 2400–2483.5 MHz, 5470-5725 MHz and 5725-5875 MHz bands anywhere within the state of Qatar as per the general terms and conditions for radio spectrum licensing, specific terms and conditions, special conditions (if any) and technical schedule (s) of this License.

License Number:

Licensee:

Address:

License Type:

Commencement and Termination Dates:

The License comes into effect on DD/MM/YY and subject to revocation or suspension, expires on DD/MM/YY unless renewed in accordance with the Regulations.

Signed:

On behalf of the Supreme Council of Information and Communication Technology ("ictQATAR")

Date:

Official Stamp

Specific Terms & Conditions**1. Radio Equipment Operation**

- 1.1 The equipment must be deployed and operated as per the parameters provided in technical schedule (2) after its submission unless there is an objection from ictQATAR in which case the amended parameters must be complied with.

2. Technical Conditions

- 2.1 The following technical criteria must be taken into account for outdoor deployment of the radio equipment in the 2400–2483.5 MHz band:

- (a) Maximum mean e.i.r.p. for FHSS:
 - (i) 1 Watt for systems employing at least 75 non-overlapping hopping channels
 - (ii) 125 mW for all other systems
- (b) Maximum mean e.i.r.p for DSSS: 1 watts
- (c) For point-to-point operations, transmitting antennas with directional gain greater than 6 dBi may be deployed provided the maximum peak output power and the maximum conducted output power is reduced by 1 dB for every 3 dB that the directional gain of the antenna exceeds 6 dBi.

- 2.2 The following technical criteria must be taken into account for outdoor deployment of the radio equipment in the 5470 – 5725 MHz band:

- (a) The maximum mean e.i.r.p. allowed is 1 Watt
- (b) The maximum mean density is 50mW/MHz in any 1 MHz band
- (c) WAS and RLANs operating in the band 5470 – 5725 MHz shall either deploy transmitter power control of at least 3dB on the maximum power or if transmitter control is not used then the maximum e.i.r.p. and mean power density shall be reduced by 3 dB.
- (d) The equipment shall use Dynamic Frequency Selection (DFS).

- 2.3 The following technical criteria must be taken into account for outdoor deployment of the radio equipment in the 5725 – 5850 MHz band:

- (a) Maximum mean e.i.r.p. of 2 W for outdoor applications.
- (b) Maximum mean density of 23 dB/MHz
- (c) Both DFS and TPC (12 dB range) should be implemented.
- (d) The frequency range 5795 – 5815 MHz should not be used and should be notched out to protect RTTT devices.

- (e) Additionally the e.i.r.p. spectral density of the transmitter emissions should not exceed the following values for the elevation angle θ (degrees) above the local horizontal plane (of the Earth) to protect FSS GSO satellite receivers:
- (i) For sectorized⁹ and Omni-directional deployments:
 - a. -7 dB(W/MHz) for $0^\circ \leq \theta < 4^\circ$
 - b. $-2.2 - (1.2 * \theta)$ dB(W/MHz) for $4^\circ \leq \theta \leq 15^\circ$
 - c. $-18.4 - (0.15 * \theta)$ dB(W/MHz) for $\theta > 15^\circ$
 - (ii) For P-MP Customer Terminal Station and P-P deployments:
 - a. -7 dB(W/MHz) for $0^\circ \leq \theta < 8^\circ$
 - b. $-2.68 - (0.54 * \theta)$ dB(W/MHz) for $8^\circ \leq \theta < 32^\circ$
 - c. -20 dB(W/MHz) for $32^\circ \leq \theta \leq 50^\circ$
 - d. $-10 - (0.2 * \theta)$ dB(W/MHz) for $\theta > 50^\circ$

3. Definitions

- 3.1 **DSSS:** means direct sequence spread spectrum
- 3.2 **EIRP:** effective isotropic radiated power means the amount of power that a theoretical isotropic antenna would emit to produce the peak power density observed in the direction of maximum antenna gain.
- 3.3 **FHSS:** means frequency hopping spread spectrum
- 3.4 **FSS:** means a radiocommunication service between earth stations at given fixed positions via one or more satellites.
- 3.5 **GSO:** means a geosynchronous satellite is a satellite in geosynchronous orbit, with an orbital period the same as the Earth's rotation period.
- 3.6 **ictQATAR:** The regulator in Qatar established under Amiri decree Law No. 36 for 2004 and as further defined in Amiri decree Law No. 34 of 2006.
- 3.7 **Technical Schedule (2):** A part of a radio spectrum license, through which parameters relating to station/link are provided to ictQATAR 10 working days prior to deployment of the station/link for area-based or light license categories.

⁹ e.g. P-MP Central or Base Station

Special Conditions
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Technical Schedule (2)

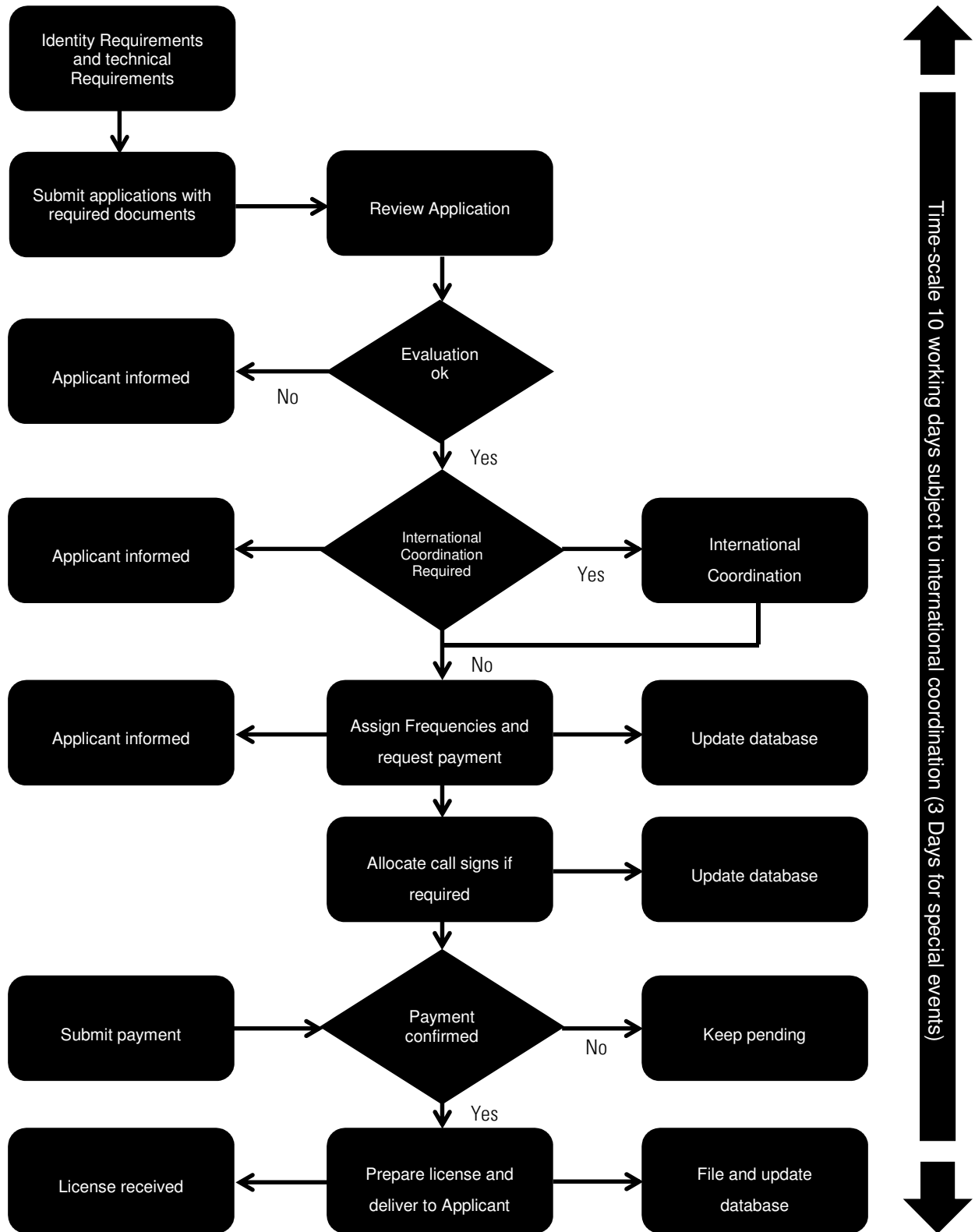
This schedule forms part of the point to point/point to multipoint/ multipoint to multipoint light license for 2.4 GHz, 5.4 GHz & 5.8 GHz Bands No. XXXX issued to XXXX, the Licensee on [Date].

	Site A (For P-P)/Base Station (For P-MP)/ Mesh Node (For MP-MP)		Site B (For P-P)	
Location (lat and long)				
Path length (point to point only)				
Transmit frequency				
Polarisation				
Transmitter eirp (Note)				
Bandwidth (MHz)				
Equipment manufacturer				
Equipment model number				
Bit rate (Mbps)				
Modulation				
Height of antenna (AGL or ASL)				
Antenna manufacturer				
Antenna model number				
Out station (OS) details (For P-MP)	OS1	OS2	OS3	OSXXX
Main Site				

Location(Lat and Long)				
Site name				
Frequency(ies)				
Equipment manufacturer				
Equipment model number				

Note: Maximum eirp measured at the output of the antenna.

ANNEX B: APPLICATION PROCESSING PROCEDURE



ANNEX C: APPLICATION FORM



**ictQATAR REGULATORY AUTHORITY
APPLICATION FOR FIXED P-P/P-MP/MP-MP FREQUENCY
ASSIGNED/BAND ASSIGNED/LIGHT LICENSES**

FORM: SL/01

APPLICANT'S DECLARATION

1.1 I declare that:

- the information provided in this application is complete and correct;
- any equipment and / or radio spectrum licensed as a result of this application will be used in compliance with applicable Rules and Regulations;
- I / we will notify ictQATAR of any changes to the information provided;
- I am authorized to sign this application on behalf of the applicant.

1.2 Name:	1.6 Company stamp (if applicable):
1.3 Position:	
1.4 Signature: 1.5 Date:	

APPLICANT INFORMATION

2.1 ictQATAR Customer Number:

Please note. If you have an existing customer number and have previously provided the following information you need only complete the Applicant Information sections if your details need to be amended in our records.

2.2 Name / Company / Organisation:

2.3 Nationality / Place of registration:

2.4 Profession:

2.5 PO Box:

2.6 Address:

2.7 Main contact:	2.10 Position:
2.8 Contact email:	2.11 Mobile Tel:
2.9 Office Tel:	2.12 Fax:

INVOICING INFORMATION (IF DIFFERENT FROM ABOVE)

3.1 Name / Company / Organisation:

3.2 PO Box:

3.3 Address:

3.4 Invoicing contact:	3.7 Position:
3.5 Contact email:	3.8 Mobile Tel:
3.6 Office Tel:	3.9 Fax:

APPLICATION TYPE (TICK AS APPROPRIATE)

New application:	Renewal:	Modification:	Cancellation:
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APPLICATION SUBMISSION

<p>Please send* completed applications to:</p> <p>* by fax, post, courier or hand deliver.</p>	<p>Regulatory Authority – Spectrum Affairs The Supreme Council of Information & Communication Technology (ictQATAR) P.O. Box 23264, Al Nassr Tower, Post Office Roundabout, Al Corniche, Doha, Qatar</p>
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FOR SPECTRUM PLANNING SECTION:

Date Received:	
Approved:	Not Approved:
License Number:	Staff No.
Remarks:	
Date Completed:	

FOR SPETRUM MANAGEMENT SECTION:

Date Received:	
Approved:	Not Approved:
License Number:	Staff No.
Remarks:	
Date Completed:	

TYPE OF LICENSE

1.1 Type of license required: (Note: please contact ictQATAR if you require guidance on which license you need)

P-P frequency assigned (link)		P-P frequency assigned (area)		P-P block assigned	
P-MP frequency assigned (Network)		P-MP / MP-MP frequency assigned (area)		P-MP / MP-MP block assigned	
P-P Light licensed for 65 GHz, 70 GHz and 80 GHz bands		P-P/P-MP/MP-MP Light Licensed for 2.4 GHz, 5.4 GHz & 5.8 GHz bands			

Please complete the following sections, as needed

PURPOSE OF LINK(S)/NETWORK(S)

TECHNICAL DETAILS: P-P FREQUENCY ASSIGNED LINK/AREA (TO BE FILLED FOR EACH LINK¹)

2.1 Total number of links (for P-P Link License)							
2.2 For each link, please state:							
2.3 Link Number, 1 of:							
2.4 Date req'd:	2.5 Band (See Guidelines):	2.6 Freq. band ² :		2.7 Preferred polarisation ³	2.8 Required availability ⁴	2.9 Est'd path length (km)	2.10 Preferable Transmit Hi/Lo Status* ⁵ :
		Lower:	Upper:				
2.11 Link location A:	Lat:	Long:	Site Name:		Site Address:		
2.12 Mast and mounting A: The height of the ground at the base of the mast (metres above ground level (AGL) for onshore and metres above sea level (ASL) for offshore)metres AGL/ASL							
2.13 Height of antenna (metres above ground level (AGL) for onshore and metres above sea level (ASL) for offshore)metres AGL/ASL							

¹ Required to be filled only at the time of application submission for Area based license. Details regarding additional links must be sent as per the format provided in technical schedule (2) of the license.

² Where the equipment intended to be deployed has a limited tuning range this information should also be provided.

³ Vertical (V); Horizontal (H); Co-channel dual polar (C); No preference (N)

⁴ Availability options: 99.9%; 99.99%; 99.995%; 99.999%

⁵ State any preference for end A or end B to transmit high or transmit low (otherwise leave blank)

2.14 Link location B:	Lat:	Long:	Site Name:	Site Address:	
2.15 Mast and mounting B: The height of the ground at the base of the mast (metres above ground level (AGL) for onshore and metres above sea level (ASL) for offshore)metres AGL/ASL					
2.16 Height of antenna (metres above ground level (AGL) for onshore and metres above sea level (ASL) for offshore)metres AGL/ASL					
2.17 Equipment details:					
2.18 Equipment manufacturer:					
2.19 Equipment model number:					
2.20 Bit rate (e.g. 8 Mbit/s, 34 Mbit/s etc):				Mbit/s	
2.21 Bandwidth (e.g. 7 MHz, 28 MHz, 56 MHz etc):				MHz	
2.22 Modulation Level / Type (e.g. 128/TCM, 16/QAM etc):					
2.23 Antenna details - Site A:			2.24 Antenna details - Site B:		
Antenna manufacturer:		Antenna manufacturer:			
Antenna model number:		Antenna model number:			
Antenna maximum gain (dBi):		Antenna maximum gain (dBi):			
Feeder Losses*:		Feeder Losses*:			
Any other losses*:		Any other losses*:			
To be filled for Area-based License Only					
2.25 Area for which license is required (rectangle):					
Northern limit:	Lat:	Long:	Western limit:	Lat:	Long:
Southern limit:	Lat:	Long:	Eastern limit:	Lat:	Long:
OR ⁶					
2.26 Area for which license is required (circle):					
Centre point:	Lat:	Long:	Radius (kms)		
2.27 Anticipated number of links:					
2.28 Requested frequency band/ frequency range ⁷ :					
2.29 Requested bandwidth:					
ADDITIONAL INFORMATION					

*** Optional Field**

TECHNICAL DETAILS: P-P BLOCK ASSIGNED	
3.1 Anticipated number of links ⁸ :	
3.2 Requested frequency band (s):	
3.3 Requested total bandwidth per frequency band:	

⁶ There is the option of defining the geographic area as a rectangle or a circle depending on which best fits.

⁷ Where the equipment that is intended to be deployed has a limited tuning range please specify the sub-band that is suitable

⁸ Information should be provided on the expected number of links that might be deployed within the State of Qatar over time (e.g. on a year by year basis).

3.4 Further information in support of application⁹:

.....

ADDITIONAL INFORMATION

TECHNICAL DETAILS: P-MP FREQUENCY ASSIGNED NETWORK OR P-MP/MP-MP FREQUENCY ASSIGNED AREA (FOR EACH NETWORK¹⁰)

4.1 Requested frequency band/ frequency range: ¹¹									
Base Station (for P-MP) / Mesh Node (for MP-MP) Parameters									
4.2 Location (lat and long)									
4.3 Site name and address									
4.4 Frequency (ies)									
4.5 Height of Antenna									
4.6 Site equipment manufacturer									
4.7 Equipment model number									
4.8 Bit rate (Mbps)									
4.9 Bandwidth									
4.10 Antenna manufacturer									
4.11 Antenna model number									
4.12 Antenna gain									
Outstation (OS) parameters (For P-MP)	OS1	OS2	OS3	OS4	OS5	OSXXX			
4.13 Site name									
4.14 Site location (lat and long)									
4.15 Frequency (ies)									
4.16 Transceiver manufacturer									
4.17 Transceiver model									
To be filled for Area-based License Only									
4.18 Area for which license is required (rectangle):									
Northern limit:	Lat:		Long:		Western limit:	Lat:		Long:	
Southern limit:	Lat:		Long:		Eastern limit:	Lat:		Long:	
OR ¹²									

⁹ Information can include typical path lengths, how will undertake own planning and avoid interference to other users, how will ensure efficient use of spectrum. Also explanation of why require access to specific bands and how total amount of bandwidth has been determined.

¹⁰ Required to be filled only at the time of application submission for Area based license. Details regarding additional links/networks must be sent as per the format provided in technical schedule (2) of the license.

¹¹ Where the equipment that is intended to be deployed has a limited tuning range please specify the sub-band that is suitable

¹² There is the option of defining the geographic area as a rectangle or a circle depending on which best fits.

4.19 Area for which license is required (circle):				
4.20 Centre point:	Lat:	Long:	Radius (kms)	
4.21 Anticipated number of Base Stations or Mesh Nodes:				
4.22 Requested bandwidth:				
ADDITIONAL INFORMATION				

TECHNICAL DETAILS: P-MP/MP-MP BLOCK ASSIGNED	
5.1 Anticipated number of base stations or mesh nodes ¹³ :	
5.2 Requested frequency band (s):	
5.3 Requested total bandwidth	
5.3 Further information in support of application ¹⁴ :	
ADDITIONAL INFORMATION	

TECHNICAL DETAILS: LIGHT LICENSED P-P FOR FOR 65,70 & 80 GHZ BANDS (FOR EACH LINK¹⁵)		
8.1 Link No, 1 of:		
	Site A	Site B
Location (lat and long)		
Path length		
Transmit frequency		
Polarisation		
Transmitter eirp		
Bandwidth (MHz)		
Equipment manufacturer		
Equipment model number		
Bit rate (Mbps)		
Modulation		
Emission class		
Height of antenna (AGL or ASL)		
Antenna manufacturer		
Antenna model number		

¹³ Information should be provided on the expected number of base stations / nodes that might be deployed.

¹⁴ Information can include network details and how will ensure efficient use of spectrum.

¹⁵ Required to be filled only at the time of application submission. Details regarding additional links must be sent as per the format provided in technical schedule (2) of the license.

Antenna Gain		
8.2 Further information in support of application ¹⁶ :		
.....		
ADDITIONAL INFORMATION		

TECHNICAL DETAILS: LIGHT LICENSED P-P/P-MP/MP-MP FOR 2.4, 5.4 & 5.8 GHZ BANDS (FOR EACH LINK/NETWORK¹⁷)

4.1 Link/Network No, 1 of:						
	Station A (For P-P) / Base Station (For P-MP) / Mesh Node (for MP-MP) Parameters			Station B (for P-P)		
4.2 Location (lat and long)						
4.3 Site name and address						
4.4 Frequency (ies)						
4.5 Height of Antenna						
4.6 Site equipment manufacturer						
4.7 Equipment model number						
4.8 Bit rate (Mbps)						
4.9 Bandwidth						
4.10 Antenna manufacturer						
4.11 Antenna model number						
4.12 Antenna gain						
Outstation (OS) parameters (For P-MP)	OS1	OS2	OS3	OS4	OS5	OSXX
4.13 Site name						
4.14 Site location (lat and long)						
4.15 Frequency (ies)						
4.16 Transceiver manufacturer						
4.17 Transceiver model						

9.3 Further information in support of application ¹⁸ :						
.....						
ADDITIONAL INFORMATION						

¹⁶ Information can include network details if available or anticipated numbers of terminals.

¹⁷ Required to be filled only at the time of application submission. Details regarding additional links must be sent as per the format provided in technical schedule (2) of the license.

¹⁸ Information can include network details if available

DOCUMENTS TO BE ENCLOSED

Copy of the CR

Copy of the Corporate Card

Detailed Technical Specifications

Network Diagram¹⁹

Antenna Radiation Pattern

For Area and block Licenses applicant is additionally required to provide justification:

- a) that it currently or potentially has a major demand for frequency spectrum
- b) that it has the competence to manage the assigned frequencies / blocks of spectrum on area / national basis respectively with due attention to efficient use of spectrum, avoidance of interference and the resolution of any cases of interference which may arise.

Note: Filled-in application form must be routed through MoFA for Foreign Missions & Embassies

DOCUMENTS TO BE ENCLOSED (FOR CANCELLATION)

Copy of receipt of final payment

Original license

Copy of the shipment document (Airway bill & packing list)

or

Declaration that equipment will be written-off under the supervision of ictQATAR staff

¹⁹ Wherever possible an initial / planned network diagram should be provided for information in support of the application.